ATTACHMENT 1

VERSION 4

TQA™

TRANSPORT QUALITY ASSURANCE® HANDBOOK

A quality assurance program designed specifically for TRANSPORTERS, PRODUCERS AND HANDLERS of pigs.

pork checkoff® Transport Quality Assurance®

pork.org | 800.456.PORK

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TQA MISSION:

To continuously build a culture of protecting and promoting animal well-being through training and certification of animal handlers and transport personnel, using current industry-proven techniques which will lead to quality pork products and provide consumer confidence in the US pork industry.

Introduction

Transport Quality Assurance® - Building Trust for a Stronger Industry

In business, many trends come and go. But one constant that will never change is the need to earn the trust of your customers. For the pork industry, and all businesses involved in the food chain, earning and maintaining the trust of our customers - retail, foodservice and the consuming public - has never been more challenging. This fact, combined with our industry's desire to conduct our business according to high ethical standards and best practices, led to the development and evolution of the Transport Quality Assurance (TQA) program. Originally launched in 2002, TQA has undergone three revisions to provide the most current, science-based information on humane handling and transport of pigs to over 25,000 handlers and transporters in the industry. The TQA program helps pig transporters, producers and handlers define best practices for handling, moving and transporting pigs and the potential impacts those actions can have on pig well-being and/or pork quality.

We Care: Making our Industry Stronger

There has been a growing interest among food-chain customers and the general public with the way food is produced. Recognizing these concerns must be addressed to better position the industry's track record of responsibility, pork industry leaders launched the We Care initiative. The We Care initiative seeks ongoing improvement in the pork industry's production practices, building upon and promoting to those outside the industry its strong record of responsible farming. TQA is a critical component of the We Care initiative and is a clear demonstration of the industry's commitment to responsible farming and continuous improvement. At the heart of this commitment is a statement of ethical principles which asks each and every member of the pork industry to commit to:

- Produce safe food
- Protect and promote animal well-being – including proper handling and transport at all phases of production
- Ensure practices to protect public health
- Safeguard natural resources in all of our practices
- Provide a work environment that is safe and consistent with our other ethical principles
- Contribute to a better quality of life in our communities

The Right Thing to Do. For Your Business. For Your Industry.

TQA is a clear demonstration of how the pork industry promotes and implements responsible practices when handling and transporting pigs. Not as a result of regulation or mandate, but rather as an acknowledgement that adhering to good production practices is a good business decision and is the right thing to do. The spirit of continuous improvement - always striving to do better - is a mindset that has long been embraced by pork industry stakeholders. When the industry is responsible and proactive, every stakeholder - including pig handlers and transporters - benefits. Producer leadership urges all those involved in the movement and transport of pigs to recognize that we all share a duty to demonstrate responsible pork industry practices. Full participation in the TQA program and implementation of the recommendations are critical to building our customer trust while continuing to enhance the integrity of the pork industry.

The Role of Handlers and Transporters.

Pig handlers and transporters play a key role in the pork production process. Handling and transporting the pigs in our care are essential elements to the multi-site pork production model that is currently used in the United States today. The pork production system involves not only moving animals from the farm to the market or harvest facilities, but it also involves handling and moving an animal several times throughout the production cycle. Animals are often moved and handled for purposes of:

- Routine daily care
- Treatment of an illness or injury
- Reproduction
- Relocation to another production phase and location/site
- Marketing

The figure below illustrates the animal-flow through a typical pork production system. Each arrow in the illustration is a point where pig/handler interactions can occur through handling and transportation.

Pig Flow in a Typical Pork Production System

No matter what segment of the pork production system, the actions of a handler or transporter can have a significant impact on pig well-being, health, biosecurity and pork quality.

Animal Well-Being

The conditions under which pigs are handled and transported can have a direct impact on their well-being. Research has shown that using good animal handling practices benefit the pig, the handler and the industry. For the pig, good animal handling can result in the reduction or elimination of stressful experiences and therefore better well-being. For the handler, good animal handling generally results in easier pig movement which means better well-being and less frustration for the animal handler. Other benefits to the animal handler include a decrease in transport losses, reduced time to load and unload pigs, reduced weight loss and better meat quality. Becoming a TQA Certified Handler demonstrates your commitment to promote and protect pig well-being to our customers and consumers. Incidents of poor animal handling or abuse are ethically wrong and unacceptable. It is important to remember that an individual's actions, both positive and negative, can have a direct impact upon themselves, the company they represent and possibly the entire U.S. pork industry.

Animal Health and Biosecurity

Healthy animals are essential to a successful pork production operation and are better able to fully express their lean genetic potential. Diseases can be introduced into herds through the loading and transportation processes and through the introduction of new pigs into the herd. Preventing disease movement and introduction makes it imperative that handlers, both in production facilities and those driving trucks, take the necessary steps and follow biosecurity protocols to minimize the spread of disease agents and ensure the health of the animals they interact with.

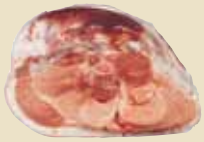
Pork Quality

Improper handling and transport of pigs is one of the largest profit-reducing issues facing the pork industry today. Most losses typically result from the events immediately before, during and after transport of the pigs. Evidence of improper handling and/or transport can be seen through:

- Carcass losses resulting from trimming off bruises
- Pale, soft and exudative meat (PSE)
- Dark, firm and dry meat (DFD)

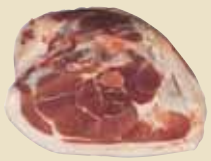
Estimates show that bruises alone can cost the U.S. Pork Industry millions of dollars per year and overall pork quality defects total several hundred million dollars annually.

COLOR - TEXTURE - EXUDATION



PSE **Pale pinkish gray, very Soft and Exudative. Undesirable appearance and shrinks excessively.**

RFN **Reddish pink, Firm and Non-exudative. “IDEAL”. Desirable color, firmness and water-holding capacity.**



DFD **Dark purplish red, very Firm and Dry. Firm and sticky surface, high water-holding capacity.**

Expectations of TQA Certified Handlers

TQA Certified Handlers are expected to uphold the ethical principles of We Care everyday. Whether handling pigs on the farm or transporting them, TQA Certified Handlers have a responsibility to:

- Protect food safety
- Protect and promote pig well-being
- Protect public health
- Safeguard natural resources
- Promote a safe work environment
- Contribute to the communities in which we live and operate

1 HANDLING

Using proven pig handling and movement practices will help contribute to a safe and positive experience for the pigs and the handler. Human injuries happen more often when people are handling animals than during any other activity performed in pork production. Understanding basic pig behavior, proper handling practices and using proper handling equipment will help animal handling be a safe activity for all.

BASIC PIG BEHAVIOR

Good animal handling practices start with the handler having a good understanding of pig behavior. A significant portion of a pig's behavior can be attributed to natural instinct and is further impacted by the age, gender, health status, environment and previous experiences of the pig. Understanding a pig's basic behavior can help:

- Facilitate animal handling
- Reduce stress
- Reduce risks to a handler's personal safety
- Reduce losses due to skin injuries, bruises, fatigue and even death

The main instinctive behaviors of a pig that a handler should understand, and use to his or her advantage when possible, include:

- Fight or flight response
- Following/herd instinct

Fight or Flight Response

When confronted with a perceived threat to its well-being, a pig must make the decision to flee or fight. The general characteristics of a pig make it an animal that is typically prey and more suited to flee, or escape, rather than to fight. This flight tendency can be used to the handler's advantage, especially when the handler understands three critical concepts:

- Flight Zone
- Point of Balance
- Blind Spot

When these concepts are not used, or are used incorrectly, pigs can easily be injured when trying to escape, either through contact with another pig or pigs, or through contact with an object in their environment such as a gate, feeder or chute. Visual gaps between pens, alleys, ramps, gates, chutes or other places can appear to be an escape route to a pig and can result in injuries to the pig and/or cause balking.

The flight zone is an imaginary circle around an animal that it considers its individual space.

- When a handler enters a pig's flight zone the pig will move away. If the pig does not see an escape route, it may attempt to turn around (if necessary) and run past the handler
- The size of the flight zone is determined by the pig's familiarity with humans and will vary from pig to pig
- A completely tame animal has no flight zone - a handler can walk directly up to it and touch it
- Handlers should work with an animal from the edge of its flight zone

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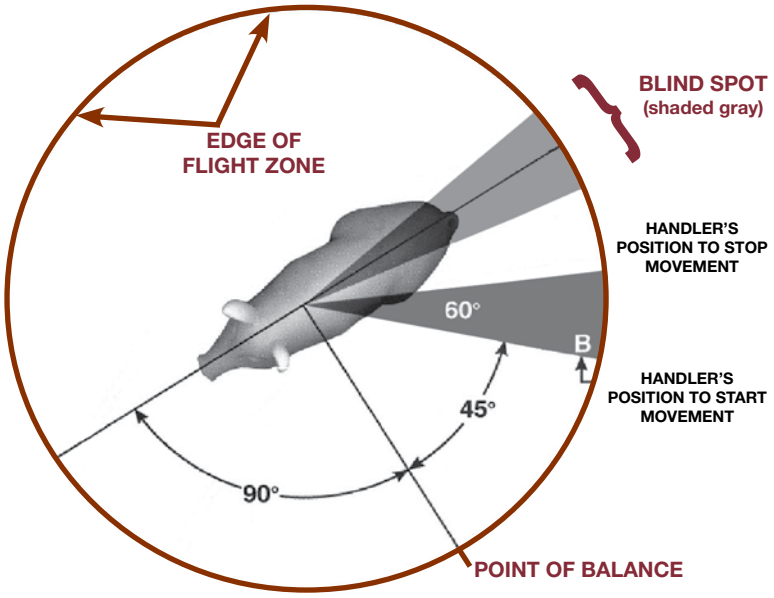
The point of balance is located at a pig's shoulder. If a handler enters a pig's flight zone, the pig will move:

- Forward if the handler approaches from behind the point of balance
- Backwards if the handler approaches from in front of the point of balance

Common error – Attempting to move a pig forward in a chute when a handler is in front of the pig's point of balance.

The blind spot exists because a pig's eyes are on the sides of its head and a pig's field of vision is approximately 310 degrees leaving a blind spot directly behind it.[1] This blind spot means that a handler cannot rely on a visual reaction to get a pig to move when standing directly behind it.

The figure below shows the flight zone, point of balance and blind spot of a pig. To facilitate pig movement, handlers should work from the edge of the flight zone behind the point of balance in the area labeled as B in the figure.



A Pig's Flight Zone, Point of Balance and Blind Spot

Following/Herding

Pigs instinctively like to stay together, in visual and/or physical contact with each other. This instinctive behavior also causes pigs to want to follow each other in order to maintain that contact. This following behavior can be an advantage when moving pigs of any age or size. Examples where this is effective include when a handler is moving pigs:

- Up or down a ramp or chute
- Through hallways
- Into or out of a pen or room

Environment

During movement, a pig may come across unfamiliar or distracting elements within its environment. These elements can cause pigs to slow, stop or change direction of movement. Pigs typically slow, stop or change direction (or balk) when they encounter something new or unfamiliar such as changes in:

- Floor surface (e.g. transition from concrete alley to wooden chute)
- Footing/traction (e.g. wet, slippery chute or loose cleats)
- Temperature (e.g. moving from a warm building to an outdoor chute/ramp on a cold day)
- Lighting – pigs move best from dark areas to lighter areas, not from light to dark

Other things that may be unfamiliar or distracting and cause pigs to balk include:

- People in their path or peripheral vision area
- Drafts or wind
- Shadows
- A beam of light shining through a crack or opening
- Equipment, trash or other objects in their path or hanging on gating (e.g. feed cart in alley)
- Loud or sudden noises
- Water puddles or drain grates
- Shiny/reflective objects or surfaces
- Change in color of equipment/gates
- Change in height of flooring, a step up into a pen or chute, etc.
- Moving or flapping objects
- Doorways that may change the width of the alley
- Other animals (e.g. pigs, dogs, cats)

PEOPLE: PIG INTERACTIONS

It is important to understand the potential effects that human interactions have on pigs and pig behavior. A person's intentions are not always understood by the pig and this may create fear and/or a negative reaction to a handler.[2] Additionally, pigs that have had regular, positive interactions with people will typically be less fearful and easier to handle.[3] Slowly walking pens on a daily basis will help pigs become used to positive interactions with people. This will train the pigs to quietly get up and calmly move away from the handler. Pigs can recall previous experiences and if they have had a bad handling experience in the past they may be more difficult to handle the next time. This previous experience may relate specifically to a human interaction or it may relate to a piece of equipment such as a loading chute.

Handlers should act calmly and avoid sudden movement, loud noises and other actions that may frighten or excite pigs. This includes shouting or creating excessive noise with other handlers when working as a team to move pigs. Pigs should be moved at their normal walking pace. Aggressive handling should be avoided as it can lead to injured or stressed pigs. Research indicates that more than 20 percent of aggressively-handled market hogs can become injured, stressed or fatigued compared to 0 percent of those handled properly.[4]

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Aggressive handling includes things such as:

- Overuse, or improper use, of electric prods
- Loud noises and yelling
- Moving pigs too fast
- Moving too many pigs per group
- Overcrowding pigs in chutes, ramps and alleyways
- Rough physical contact

Willful acts of neglect or abuse are unacceptable. Willful neglect and abuse are defined as acts outside of normally accepted production practices that intentionally cause pain and suffering. The National Pork Board strongly encourages anyone with knowledge of possible animal abuse or neglect to report these actions immediately to the proper responsible persons. If a willful act of abuse is observed, immediately intervene to stop the situation if reasonably and safely possible. Discuss the situation with the appropriate authority (owner, manager, receiving crew, etc.). Companies have animal-welfare policies that clearly define how these situations are to be handled and reported. Transporters and handlers should be familiar with these policies as committing willful acts of abuse or failure to report witnessing a willful act of abuse may be grounds for termination of employment. Each state has laws that address animal cruelty, and therefore willful acts of abuse can be punishable by law.

HANDLING PIGS OF VARIOUS TYPES AND SIZES

Basic handling protocols apply to nearly all pigs but requirements for certain sizes and types of pigs differ and specific techniques may need to be used.

Handling BREEDING STOCK

Breeding stock (sows, gilts and boars) are the largest and most powerful pigs a handler will work with and handlers should use extra caution when moving these animals. A sorting board should be used when attempting to turn or stop a large animal. The handler should not use his or her body alone. If the animal appears aggressive or agitated, it may be safer for the handler to move out of the way than to risk potential injury.

Additionally, breeding stock are the most unpredictable animals, especially boars. Boars are particularly aggressive and most unpredictable when exhibiting mating behaviors, such as when they are being used for estrus detection. **Boars are especially dangerous because their tusks can cause injury so handlers should use extra caution and never turns their back to a boar.** Sows can be aggressive as well, especially when they perceive their litter are being threatened (e.g. such as during piglet processing or weaning). In addition to their reproductive behaviors, pigs of breeding age require extra caution just because of their sheer body mass. Therefore, it is important for these pigs to be familiar with positive human interactions.

Moving breeding females and boars in and out of pens and/or individual housing units can be a challenge even to the best handlers. There are many techniques that can be used based on what is known about pig behavior. For example, when trying to move a sow into a farrowing stall she may resist because she sees her path is blocked by the stall end being closed. This may be overcome by leaving the stall door open and having someone close it when she enters the stall, but before she can move out the far end.

These large animals also can cause injury, to people or pigs, through sudden movement of their heads or by pinning the handler between the pig and a fixed object such as a gate or feeder. Often this type of injury is a result of the handler's arm or leg being in the wrong place at the wrong time. An example may be a crushing or pinching injury to a hand or foot when a pig closes a gate with its body.

Handling PIGLETS

Handling piglets can present a safety challenge to the handler. Piglets have sharp teeth and can bite the handler when they are picked up. The sow may also attempt to bite the handler when he or she reaches into the stall to grab a piglet.

Piglets can either be moved by herding or by picking them up and moving them by hand or with a cart. Piglets should be picked up by holding under the rib cage or by grabbing a rear leg, above the hock, and then gently setting the piglets into a cart, alleyway or pen. Piglets may squirm and wiggle when picked up so care should be used so that they are not dropped. **Piglets should not be tossed or thrown.** When being held for an extended period of time, piglets should be held under the rib cage next to the handler's body or by both rear legs using two hands.

Handling NURSERY AND FINISHER PIGS

Nursery and finisher pigs grow rapidly and quickly become too large to lift and/or hold.

When sorting and moving these pigs, it is often the best practice to work in pairs and have one person work the pen gate while the other sorts the pigs with a sorting board. This is especially true when finished pigs are being sorted for load-out as the first pigs may be reluctant to leave their pen mates.

Handlers should rely on a sorting board instead of their bodies to turn or stop large finishing pigs. A bifold panel is a particularly useful device as it creates a corralling effect, reduces an escape route for the pig and increases safety for the handler. If an animal appears aggressive or agitated, it may be safer for the handler to move out of the way than to risk a potential injury.

GROUP SIZES

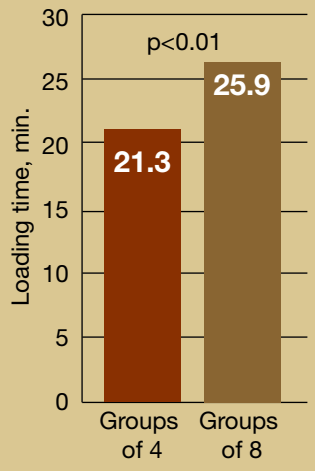
Pigs should be moved in groups large enough to be efficient for the production system, but small enough to be safe for the pigs and the handler(s). Groups of finished pigs and breeding stock should be small enough so that the handler can always maintain control of the lead pig. Additionally, research indicates that reducing finish pig group size from 8 to 4 pigs during loading significantly decrease the amount of time to load the trailer and the percentage of dead and non-ambulatory pigs at the farm and slaughter plant.[5] The suggested group sizes are based on best industry practice but facility design and conditions of the environment and/or animals may require adjustment to group size.

Suggested group sizes by pig type.

Pig type/size	Suggested group size
Weaned piglets	20
Nursery pigs	20
Finished/Market pigs	3-5
Sows/Gilts	1-5*
Boars	1-5*

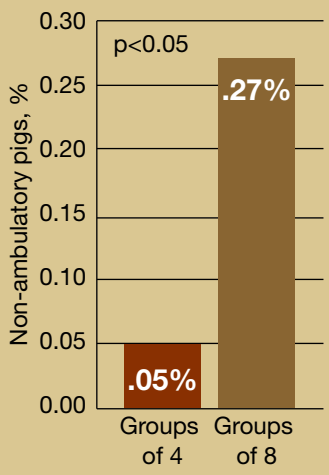
**Depending upon temperament and safety conditions, may require moving individually.*

Figure 1: Effects of group size during loading on loading time.*



*Refers to the amount of time required to load a trailer deck (n=87 pigs)

Figure 2. Effects of group size during loading on non-ambulatory pigs at the farm.



HANDLING TOOLS/EQUIPMENT

There are many different pieces of handling and sorting equipment on the market, or that can be easily made on the farm, to help you sort or move pigs in a safe, humane and efficient manner.

Handling equipment is effective by providing barriers or stimuli including:

- Physical barrier (e.g. sorting board)
- Visual barrier (e.g. matador's cape)
- Auditory stimulus (e.g. rattle/shaker paddle)
- Visual stimulus (e.g. nylon flag)

Most of these tools are effective for a specific situation and should not be used for others. For example, a plastic rattle/shaker paddle may be effective for moving weaned piglets from the farrowing room to the nursery, but is not a tool to use when moving a boar to his pen after he completes a round of estrus detection.

The use of an electric prod is a stressful event.

- Numerous research studies have shown that increased use of an electric prod increases stress in pigs so use of electric prods should be avoided or absolutely minimized
- Never prod a pig in sensitive areas such as eyes, nose, anus, testicles, etc.
- If regular use of an electric prod is needed, evaluate your handling procedures and facilities
- An electric prod should not be the primary tool for moving pigs and should only be used as a last resort

If it is necessary to use a prod, it should be applied to the back of the pig behind the shoulder[6] and the duration of the shock should not exceed one second. The pig should be allowed time to respond before another shock is given. Electric prods should not be used in the pen[7].

Willful acts of neglect or abuse are unacceptable. Willful neglect and abuse are defined as acts outside of normally accepted production practices that intentionally cause pain and suffering. This includes, but is not limited to, malicious hitting or beating an animal or using an electric prod in sensitive areas such as eyes, nose, anus, testicles, etc.

PERSONAL PROTECTIVE EQUIPMENT (PPE)

To determine what PPE is required, the handler should conduct a hazard assessment. Walk through the tasks required during loading, transport and unloading. Then, considering the equipment to be used, make a list of potential injuries that could occur. Develop a list of PPE that should be used by the handler to help protect him or her from those injuries. Typically, the minimum amount of PPE a handler should consider when handling pigs is a pair of safety-toed boots and a sorting board. Handlers operating inside a truck/trailer should also consider wearing knee pads and/or shin guards and a bump helmet to protect themselves from possible injury due to contact with the trailer's surfaces.

All handlers should also consider using these PPE items, depending upon the hazard assessment and company protocols:

- Dust mask
- Eye protection
- Hearing protection
- Gloves

Acceptable equipment to use when handling pigs

SORTING BOARD/ PANEL	The most versatile tool is typically the sorting board or sorting panel and can be a single or bifold panel. A sorting board can provide both a physical and a visual barrier. When using a sorting panel make sure to use the ground as an anchor, don't try to hold back a pig with the board wedged against your legs/knees.	
PLASTIC RATTLE/ SHAKER PADDLE	The rattle/shaker paddle can provide auditory and visual stimuli. Shaker cans or bottles can also be used. Rattle paddles can also be used to gently tap an animal, but should not be raised higher than shoulder level.	
NYLON FLAG	A nylon flag is an effective visual stimuli in many cases, especially with larger pigs. Used correctly, it can draw a pig's attention, as well as block its visual path.	
MATADOR'S CAPE	A matador's cape can be effectively used as visual barrier with nearly all pigs. Its main use is as a tool to block a pig's vision and provide the illusion of a dead-end.	
PLASTIC RIBBONS ON A STICK	Ribbons can be used as visual stimuli and when waved/flapped can help create distraction so that the pig moves in the opposite direction.	
ELECTRIC PROD	An electric prod should be the tool of last resort. It should only be used when absolutely necessary and only following strict guidelines as previously listed.	

NOTES:

2 JOURNEY PLANNING

A pig may be loaded onto a truck, transported then unloaded several times during its life. Safety practices need to be followed during each of these moves. A four-way interaction between animals, handlers, facilities and transport vehicles occurs during loading and unloading. Each of these components must be understood by the handler in order for safe and efficient loading and unloading to occur.

PLANNING

Proper preparation is critical when loading and unloading. It is important to have a clear plan and all handlers involved should understand the plan. It is a best practice to load and unload as a team with each individual handler having predetermined roles and responsibilities.

For example, have a clearly defined team lead that has the necessary authority to make decisions during the loading process, including whether or not to load or unload a specific animal. When loading finished market pigs a pair of handlers may work to sort, or cut, the correct number of pigs from a pen into the alley, a third handler moves them down the alleyway to the doorway of the building, and a fourth handler moves them up the chute onto the truck. Understanding roles and following through with the team plan makes moving animals easier and helps reduce confusion and the potential for animal and/or worker stress during the handling process.

It is important for everyone to be aware of the timelines and follow them. If a delay occurs, this change in the timeline needs to be communicated to all involved in the transport process, including the people at the origination and destination points.

Also keep in mind that the loading/unloading plan should follow biosecurity protocols.

Facilities and Equipment

Facilities should be properly designed and constructed, and in good repair, with functional equipment in place before loading or unloading pigs. Designs that provide consistency of width from alleyway to the truck are ideal because the hourglass effect of a smaller doorway or chute is eliminated. This chapter provides recommendations for facility designs that facilitate easy pig movement. However, there may be other configurations that are also effective but may require different handling skills to prevent animals from balking, jamming or becoming stressed.

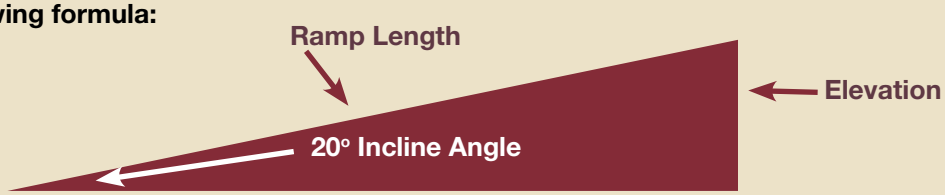
Alleyways and Doorways

When building a new finishing barn, the width of the alleyway is an important design component for animal handling. Alleyways should be 3-feet wide to accommodate moving three to five finishing pigs of current market weight (~260 lbs.). This will allow two pigs to walk side by side without jamming, thereby reducing stress and speeding up the movement of pigs. Doorways should be at least the same width as the alleyway and the door should open completely to eliminate pinch points. Avoid thresholds on the floor of the doorway to reduce balking.

Ramps and Chutes

Proper design and function of ramps and chutes are to reduce the incidence of slips and falls. The correct angle of incline on ramps is very important to promote successful pig movement. Conditions of the environment and ramp design are factors that may influence the ability of pigs to use a ramp. As a general guideline, ramps should be 20 degrees or less. Pigs have difficulty climbing steep inclines, so lower angled ramps are much easier for pigs to use.

To determine how long a ramp needs to be to achieve the desired angle, use the following formula:



Elevation ÷ 0.34202 = Ramp Length for 20 degrees ramp angle

Because most ramps are a fixed length, and trailers are typically a fixed height, it may be useful to be able to calculate whether the angle of the ramp exceeds the suggested maximum ramp angle. To determine whether the angle of a ramp exceeds recommendations, using the known length and elevation, use the following formula:

If Elevation ÷ Ramp Length < 0.34202 the incline angle is less than 20 degrees

Example: Elevation = 3.75 feet Ramp Length = 8 feet
3.75 feet ÷ 8 feet = 0.46875
0.46875 > 0.34202 so the incline angle **IS NOT** acceptable

Recommended Chute Lengths

Elevation from bottom to top of chute	Length of ramp for 20° slope
1 ft	5 ft
2 ft	10 ft
3 ft	15 ft
4 ft	20 ft
5 ft	25 ft
6 ft	30 ft
7 ft	35 ft
8 ft	40 ft

The following items are critical to proper ramp and chute design:

- Concrete ramps should have stair steps and nonslip surfaces to provide traction and help avoid slipping. It is recommended that the steps should have a 2.5-inch rise and a 10-inch tread
- Ramps for market and adult hogs should have cleats spaced eight inches apart
- Ramps for piglets and nursery pigs should have cleats spaced three inches apart
- Ramps should have a flat dock at the top for pigs to step onto when they exit the truck and before they enter the ramp
- Curves are preferred over sharp turns and angles to facilitate pig movement – A pig views a 90-degree turn as a dead end and may stop or try to turn around

Maintenance and repair of ramps is also important.

- Sharp, protruding or otherwise injurious items should be removed or repaired
- Broken or missing cleats should be repaired or replaced
- Moving parts such as cables, pulleys and hinges should be inspected regularly and maintained as necessary
- Ramps and chutes should be kept free of trash, debris and other potential distractions
- Chutes should have adequate lighting to aid in the movement of pigs

Several options for proper chute designs may exist. One particular source recommends a double-width chute type allowing two pigs to move side-by-side at the same time. A double-width chute should be 36 inches wide and have solid outer walls. A single-width design should be 16-18 inches in width and have solid sides.[6] The chute width may need to vary depending upon the size of pig being moved to prevent pigs from jamming.

Transport Trailer

Trailers should be kept in good repair and should be kept clean. The trailer should have non-slip solid flooring to prevent the animals from slipping and falling. All gating and doors should open and close freely and must be able to be secured shut and not have gaps where pigs can get their head or legs stuck or fall out of the truck. Internal ramps should function properly and extend all the way to the floor. There should be no sharp or protruding objects in the trailer that may injure the pigs.

SCHEDULING

Communication between the transporter and the loading and unloading locations is essential. It is important that all loads are scheduled regardless of the type or size of pigs. For example, it doesn't matter if you are delivering finished pigs to the harvest plant or a load of nursery pigs to a finishing site. The goal of everyone involved in scheduling transportation is to minimize the amount of time pigs must be on a trailer. Not following scheduled delivery times can cause backups at the plants, which result in increased waiting times for other drivers and pigs.

The following items will help minimize transport stress on the pigs and reduce the potential for negative impacts on pork quality:

- Maintain a steady pace on the road
- Minimize the total number of stops
- Avoid sudden stops, starts and sharp turns
- Follow the delivery schedule closely

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CHECKLIST

The transporter should consider completing a preparation/loading/unloading checklist for each load of pigs. This checklist may include actions to consider in preparation for arrival at the loading location and those used at the site, while in transit and at the unloading location. A sample checklist is shown below:

√	Preparation	√	Loading	√	Unloading
❑	Fuel, oil and other fluids at appropriate levels	❑	Instructions for entering site/location are known including biosecurity protocols	❑	Instructions for entering site/location are known including biosecurity protocols
❑	Truck and trailer lights operational	❑	Bill of lading	❑	Sort board/other handling tools ready and used properly
❑	Tractor (inside and out) and trailer clean and disinfected	❑	Health papers (if necessary)	❑	Clean boots and clothing available
❑	Vehicle paperwork current including insurance and registration cards	❑	Truck, cab, trailer clean and disinfected	❑	Disinfectant available
❑	Load paperwork in order including pick-up and drop-off addresses, directions and telephone contact information	❑	Weather conditions accounted for	❑	Unloading conditions are safe for handlers and pigs
❑	Weather-appropriate bedding available in trailer	❑	Sort board/other handling tools ready and used properly	❑	Pigs are not crowded when unloaded
❑	Water/cooling systems working in trailer (if appropriate)	❑	Clean boots and clothing available	❑	Pigs are not allowed back on the truck once they enter the chute
❑	Vent holes, nose vents, slots covered/uncovered appropriate for weather	❑	Disinfectant available	❑	Paperwork signed and copies delivered
❑	Trailer in proper repair so as not to cause injury to animals or handlers	❑	Container for dirty clothing and boots	❑	Container for dirty clothing and boots
❑	Clothing available for transporter and appropriate for biosecurity conditions	❑	Loading conditions are safe for handlers and pigs		
❑	Phone numbers to contact in case of emergency or delay	❑	Pigs are not crowded during loading or when in the trailer		
		❑	Pigs are not allowed back into facility once they enter the chute or truck		

3 LOADING, UNLOADING AND TRANSPORTATION

Transportation may be a stressful event in the life of a pig and is thought to be the most influential pre-harvest factor affecting final pork quality. Transportation involves factors that could be perceived as stressful to a pig such as unfamiliar noises and vibrations, rounding corners, changes in speed (acceleration/deceleration) and potential temperature extremes. Handlers and transporters should implement procedures that make transportation as safe and humane as possible. Before loading a truck it should be correctly prepared for its journey including determining loading density, proper setup for weather conditions and scheduling of transport.

LOADING AND UNLOADING PIGS OF VARIOUS SIZES

Most basic loading and unloading protocols are similar and apply to nearly all pigs, but requirements for certain sizes and types of pigs differ and specific techniques may need to be used.

Some common points to remember when loading and unloading pigs, regardless of size, include:

- The handler should use the pigs' flight zone to get the animals to go where the handler desires
- Use proper handling tools to help move the pigs. An electric prod should not be the primary handling tool. IF absolutely necessary, use according to the guidelines provided in Chapter 1
- Pigs should be moved in the correct group sizes (Chapter 1). For example, do not unload an entire trailer compartment at one time
- Getting the first pig in a group moving to enter a chute when loading or unloading may be the most challenging, once the leader is moving the other pigs may move easier due to the "follow the leader" herd instinct
- Use the proper handling tools to help move the pigs (Chapter 1)
- **Do not load any ill, injured or fatigued pigs onto a truck.** It is the position of the National Pork Board that any pig unable to walk, is ill or significantly injured, should not be transported to market channels. Where the likelihood of recovery is low, even with treatment, the pig should be humanely euthanized. The driver has the ability and the right to refuse any ill, injured or fatigued pig onto a truck
- Pigs that become ill, injured or fatigued should be handled according to the protocols denoted in Chapter 4

Loading and Unloading FINISHED PIGS

Finished or market pigs are usually 260 pounds or more. The handler should use the pigs' flight zone to get the finished pigs to go where the handler desires. Handlers should rely on a sorting board instead of their bodies to turn or stop market pigs. If an animal appears aggressive or agitated, it may be safer for the handler to move out of the way than to risk a potential injury. Some points to consider when loading and unloading finished pigs:

- Watch for signs of fatigue, including open-mouthed breathing, inability to move and splotchy skin as described in Chapter 5
- An electric prod should not be the primary handling tool. If absolutely necessary, use according to the guidelines provided in Chapter 1
- Use proper handling tools as described in Chapter 1

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Loading and Unloading WEANED PIGLETS AND NURSERY PIGS

Weaned piglets are sometimes moved directly from a farrowing room to a nursery or a wean-to-finish facility off-site. Nursery pigs, also known as feeder pigs, typically weigh ~40 pounds or more when moved to finishing facilities. These piglets and pigs must be given extra time and moved carefully so they are not injured. Some points to consider when loading and unloading piglets and nursery pigs:

- Use extra care and allow extra time for these pigs to move up, or down, the ramp and chute
- Avoid excessive noises such as yelling or banging on the truck or wall to rush and crowd pigs into or out of the truck and into the chute during movement
- Electric prods are unnecessary with weaned piglets and nursery pigs and should be avoided
- Use proper handling tools as described in Chapter 1

Loading and Unloading BREEDING STOCK

Breeding animals are typically reared off-site and are transported to a breeding herd as a gilt or boar. When they are culled, or removed from the breeding herd, they must then be moved to market. Moving these large, sexually mature pigs can sometimes present a challenge. Some points to consider when loading and unloading breeding stock:

- These pigs are most likely being mixed with unfamiliar animals which may result in aggression. Handlers should be careful not to be in the pigs' way if aggression occurs
- When breeding stock is unloaded into an unfamiliar facility, allow the animals extra time to explore and become comfortable, do not rush them
- Boars may need to be loaded individually, and/or penned separately once on the truck, to prevent injury from fighting
- It is unacceptable to cause physical damage to the snout of a boar as a means to reduce aggression
- If tusk trimming must be done, at least 0.8 inch of tusk should be left beyond the gumline to avoid cutting into the nerves and pulp of the tooth. A dehorning wire to saw through the tusks will reduce the occurrence of the tooth splintering[9]
- Remember, these animals are typically larger than the average finisher pig. Do not load them in the same compartment with finisher pigs
- An electric prod should not be the primary handling tool. If absolutely necessary, use according to the guidelines provided in Chapter 1

TRANSPORT SPACE RECOMMENDATIONS

Overcrowding pigs on a trailer is an easy and preventable mistake. This costly error can put an animal's safety at risk and cause losses to the producer and the harvester. A perceived saving in transportation costs is far outweighed by the possibility of reduced pork quality, compromised animal well-being or even death.

Overcrowding is never a viable option when transporting animals. Signs of overcrowding may include piling, excessive squealing or panting. Gates should be able to close without having to force the pigs into the space. Once a gate is closed, watch to see if the pigs have room to stand without climbing on top of each other. Listen for pigs that are squealing due to being stepped on or crowded. If overcrowding is suspected, reduce the number of head per compartment. Pigs in overcrowded conditions will quickly overheat and begin panting and open-mouth breathing and may become injured, fatigued or even die.

Review these standard transport space recommendation statements:

- Generally, space allowances should be such that pigs can lie down and stand up, in their normal position
- On short trips of less than four hours pigs may prefer to stand. Pigs need space to lie down on longer trips. If there is not enough room, pigs may compete for floor space, generating heat, noise and stress
- The trailer should have compartments with gates or dividers with working latches to limit the number of pigs in each given area
- Weather conditions and animal size should be considered when determining the number of animals to load

The transport space recommendation table shows the recommended space per pig under normal weather conditions (not hot or cold extremes). Transport losses are minimized at these recommendations, but optimal floor space is dependent upon temperature, trailer design, compartment size, etc. Changes in loading density need to be made to accommodate the weight of the pig or weather conditions. The need for these cahnges may outweigh transport costs and number of pigs left in the barn on a given day for the benefit of the animal's well-being. Research has shown that increasing loading density also increases transport losses.

TRANSPORT SPACE RECOMMENDATIONS

Average Weight (lbs.)	Square Feet Per Head
12	0.65[10]
50	1.53
100	2.32
150	2.95
200	3.48
250	4.26
300	4.79
350	5.48
400	6.39

WEATHER CONDITIONS

Improper preparation for various weather conditions, especially temperature extremes, costs the U.S. pork industry millions of dollars annually. Handlers and transporters are responsible for understanding the effects of weather on pigs undergoing transport and how to protect pigs during weather extremes.

Cold Weather

Freezing temperatures and wind chills are very dangerous to the safety of pigs. In cold temperatures, overcrowded pigs that cannot seek the protection of bedding from wind and low temperatures are potentially subject to frostbite. Frostbite can result from wind, but it may also occur from being pressed against the metal side of the truck. Newly weaned piglets and nursery pigs are especially susceptible to cold temperature extremes. The following measures are precautions to be taken to help ensure the well-being and safety of pigs being transported:

- Insert grain slats in farm trucks
- Close nose vents
- Use panels to protect pigs from crosswinds
- Block or plug a portion of the ventilation holes/slots
- Keep pigs dry
- Load fewer pigs per load
- Provide extra bedding (wood shavings, wheat straw, corn stover, etc.)

The following table illustrates recommended truck set-up procedures for finished pigs during temperature extremes.[11] These are based on best industry practice but may not be appropriate for every geographical location.

Truck Setup Procedures During Temperature Extremes *(Market Hogs)*			
Air Temp	**Bedding**	**Side-Slats**	
<10° F	Heavy (4 bags)	90 percent Closed	10 percent Open*
10-19° F	Medium (3 bags)	75 percent Closed	25 percent Open*
20-39° F	Medium (3 bags)	50 percent Closed	50 percent Open
40-49° F	Light (2 bags)	25 percent Closed	75 percent Open
> 50° F	Light** (2 bags)	0 percent Closed	100 percent Open

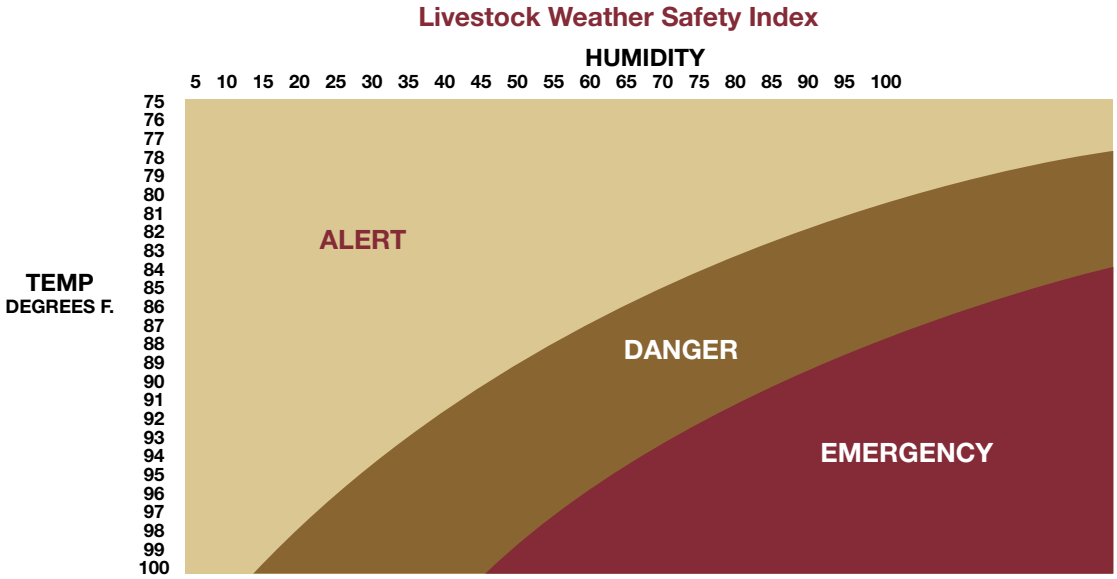
* Minimum openings are needed for ventilation even in the coldest weather.
** Consider using wet bedding if it is not too humid and trucks are moving.

Hot Weather

Hot weather and high humidity can be deadly to pigs due to their lack of functional sweat glands. The following measures are special precautions to be taken to help keep your pigs cool and to help ensure the well-being and safety of pigs you are transporting during hot weather conditions:

- Remove grain slats from farm trucks
- Open nose vents
- Unplug ventilation holes/slots
- Adjust loading density of pigs in the truck
- Schedule transportation early in the morning or at night
- Provide wet shavings to help cool pigs when the temperature is over 60° F (15° C)
- If the temperature is over 80° F (27° C) sprinkle pigs with water after loading but prior to departure. Use a large droplet spray, not a mist. Do not pour large amounts of cold water on an overheated pig as the shock may kill it.
- Be prepared to adjust to rapid temperature fluctuations such as the first warm day(s) of spring
- Do **not** bed pigs with straw in hot weather
- Load and unload promptly to avoid heat buildup
- Load fewer pigs per load

Refer to the livestock weather safety index (below) prior to loading.



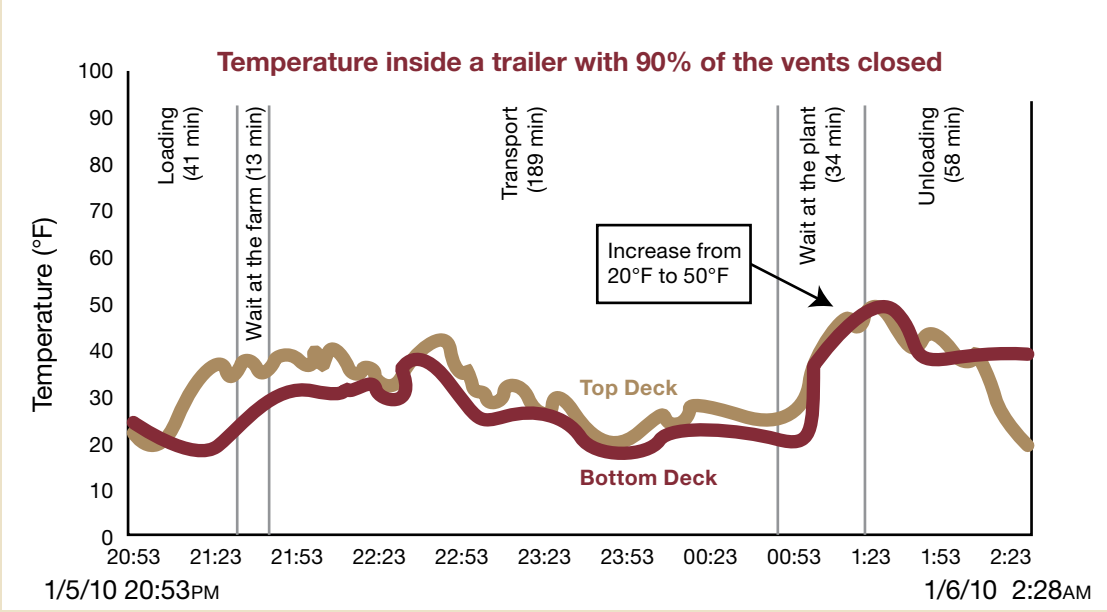
It is the transporter's responsibility to protect pigs during all weather conditions. It may become necessary for transporters to adjust trailer ventilation during the journey due to changing weather conditions. This may be true for long journeys across geographical regions or for spring and fall days that have wide temperature variations. Side boards or plugs should be added or removed accordingly to prevent the pigs becoming too hot or cold.

STOPPING

It is imperative that pigs be transported in a humane, safe and timely manner. Stopping with a loaded trailer, especially during extreme temperature conditions, should be avoided to help prevent unnecessary increases in stress and death loss. Trailers utilize passive ventilation and only have air flow when the trailer is perpendicular to prevailing winds or when the trailer is moving.

- Trucks should continue in motion during extreme weather conditions (unless it is impossible for safety or other reasons)
- If pigs cannot be unloaded upon arrival in hot weather continue driving, if possible, to generate air flow for the pigs until they can be unloaded
- Utilize water sprinklers and fan banks at the packing plant to circulate air through waiting trailers
- Do not park near other animal transporters due to the potential for reduced air flow and the increased risk of disease transfer
- If stopped during hot weather, slats and hole covers must be removed to allow for additional air flow and water sprinklers in the trailer activated

When there is no air flow, the body temperature of the pigs will cause the internal trailer to increase rapidly as shown in the graph below[12].



NOTES:

4 FITNESS OF THE PIG

FITNESS TO TRANSPORT

All pigs that are scheduled for transport should be evaluated by a handler for fitness to travel. If a pig is found to be unfit it should not be loaded, instead it should be segregated for treatment or humane euthanasia.

The following list provides some examples of animals that are unfit to be transported, including, but not limited to:[13]

- Those that are sick, injured, weak, disabled or fatigued
- Those that are unable to stand unaided and bear weight on each leg
- Those that are blind in both eyes
- Those that cannot be moved without causing them additional suffering
- Newborns with an unhealed navel
- Pregnant animals which would be in the final 10 percent of the gestational period at the planned time of unloading (They may be transported short distances using special care)
- Females traveling without young who have given birth within the past 48 hours
- Those whose body condition would result in poor welfare because of the expected climatic conditions

It is the position of the National Pork Board that any pig unable to walk, is ill or significantly injured, should not be transported to market channels. Where the likelihood of recovery is low, even with treatment, the pig should be humanely euthanized. Any pig that becomes fatigued should be moved to a resting area in an appropriate manner. A fatigued pig is defined as having temporarily lost the ability to walk but has a reasonable expectation to recover full locomotion with rest. A resting area helps enable recovery by minimizing competition for feed and water and provides the opportunity for monitoring.

FITNESS CONCERNS

Loading and unloading processes can be stressful events in the life of a pig. As described in Chapter 1, inappropriate handling techniques (aggressive handling), causing excessive stress and muscle exertion during loading and/or unloading, can exacerbate the stressfulness of this situation and potentially cause serious health problems and even death.[14] Several of the most common concerns are heat stress, increased heart rate and heart failure, porcine stress syndrome (PSS) and fatigued pigs.

Fatigue

Fatigued pigs are defined as pigs that have temporarily lost the ability or the desire to walk but have a reasonable expectation to recover full locomotion with rest. Fatigued pigs typically have an acid-base imbalance due to excessive muscle exertion which makes the blood more acidic in nature. This condition is commonly referred to as metabolic acidosis and can cause pork quality defects resulting in meat that is of low quality and of significantly less value to the industry than normal pork.

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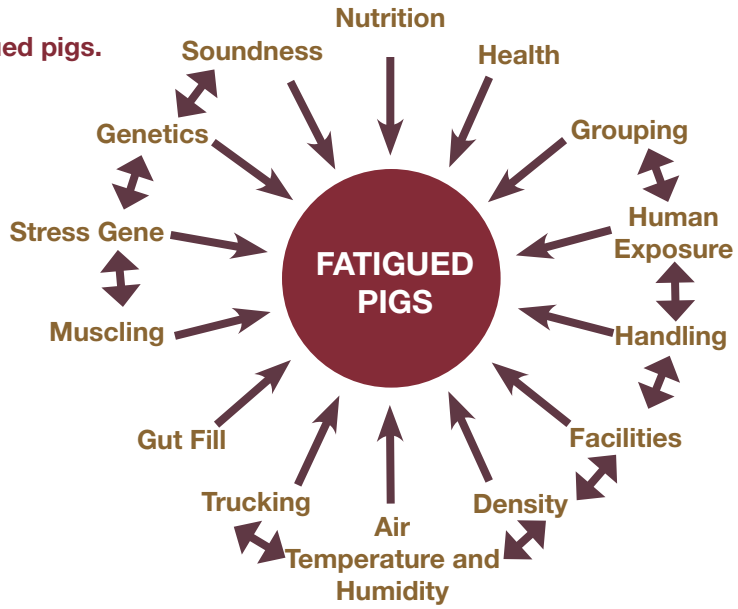
Factors that can lead to fatigued pigs.



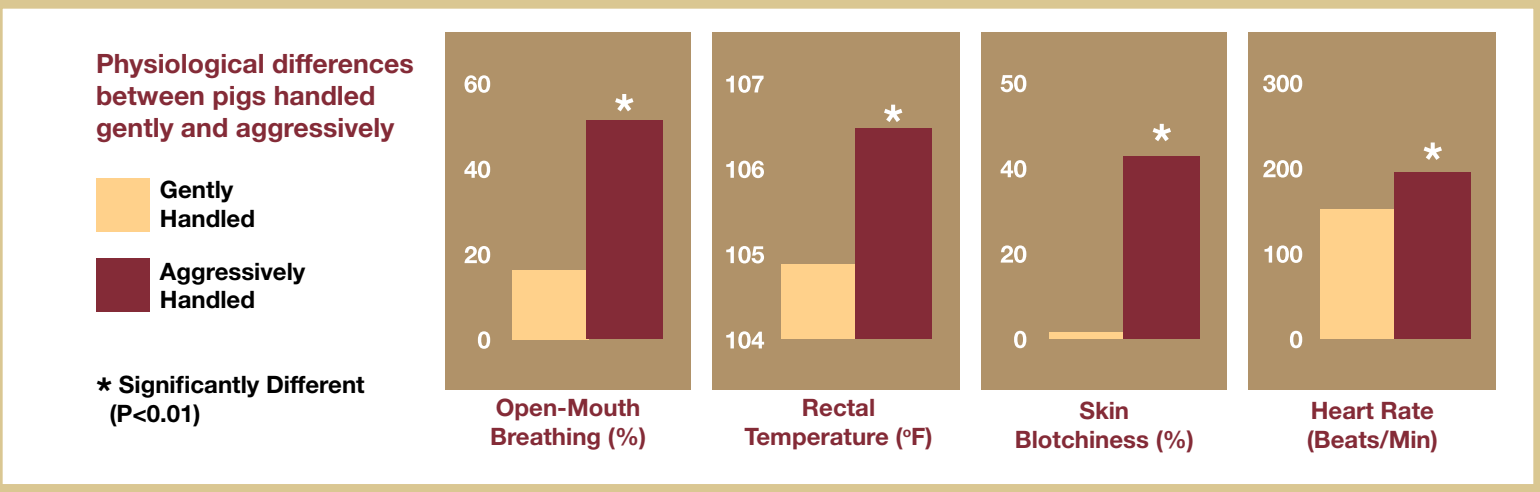
This diagram illustrates many of the contributing factors that can lead to injured, stressed or fatigued hogs. Take note of the factors that can be controlled by the producer, handler or transporter. Each of these factors can be controlled or manipulated by one or more persons involved in the handling and movement of the pigs.

When a pig experiences stress during handling or transport, it will display open-mouth breathing, skin discoloration or both. If the stress is not removed or if additional stressors are introduced, the pig will become reluctant to move, make abnormal vocalizations, develop muscle tremors, or some combination of these signs. At this stage, the pig may become overwhelmed by the accumulation of stress, in which case the pig will collapse and become nonambulatory, and, in extreme cases, death may ensue[15]. Therefore, transporters and handlers must be able to identify the following signs of stress and take the appropriate action(s) when needed.

- **Open-mouth breathing (panting)**
- **Vocalization (squealing)**
- **Blotchy skin**
- **Stiffness**
- **Muscle tremors**
- **Reluctance to move**

Additionally, a pig's heart rate and rectal temperature increase when excessively stressed or muscles are overexerted.

The graphs on the next page depict physiological differences between pigs handled gently and aggressively. Gentle handling consisted of moving pigs at a slow and calm pace with a plastic cane, whereas aggressive handing involved moving pigs rapidly with electric prods[4].



Heat Stress

Heat stress occurs when the pig's body temperature rises to a level it cannot control through its normal panting mechanism. A pig in distress will be making deep, gasping sounds. This pig should be attended to immediately or it will die. Do not make this pig move, allow it to rest. Gently sprinkle the animal with cool water. Do not pour large amounts of cold water on the pig as the shock may kill it.

Heart Failure

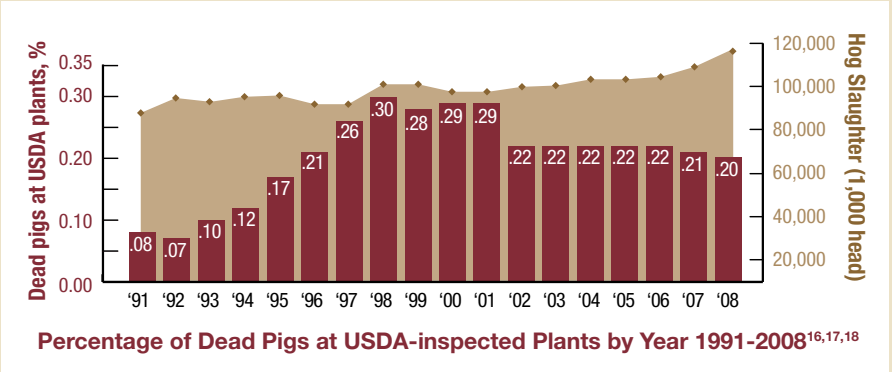
Signs of imminent heart failure occur suddenly; the pig collapses, its breathing is rapid, and the pig's ears and snout turn blue. This pig should be attended to immediately or it will die. Separate it from any other pigs and allow it to rest. Further stress will likely strain the pig's heart to the failure point and the pig will die. It may be one hour or longer before the pig recovers enough to be able to stand.

Porcine Stress Syndrome (PSS)

Porcine Stress Syndrome is an inherited disorder that can occur in pigs that carry the halothane gene. Animals with this genetic defect are extremely sensitive to stress and must be handled with extra care. When a PSS pig is stressed its body temperature rises, its skin develops red blotches, it collapses and its muscles become rigid. Immediate treatment is required using the same techniques as for a heat-stressed pig. Due to selective breeding, this gene is rarely present in the pigs found in today's commercial herds.

Total Transport Losses

Transport losses refer to those pigs that die (DOA) or become non-ambulatory during handling or transport. For finishing pigs, it is estimated that 0.7% of those transported to market either die (~ 0.22%) or become non-ambulatory (0.44%).[19] This graph shows the change in the incidence of pigs that die on the way or at the plant as compared to the number of pigs slaughtered annually. It is important to note the progress of the industry to date.



Percentage of Dead Pigs at USDA-inspected Plants by Year 1991-2008[16,17,18]

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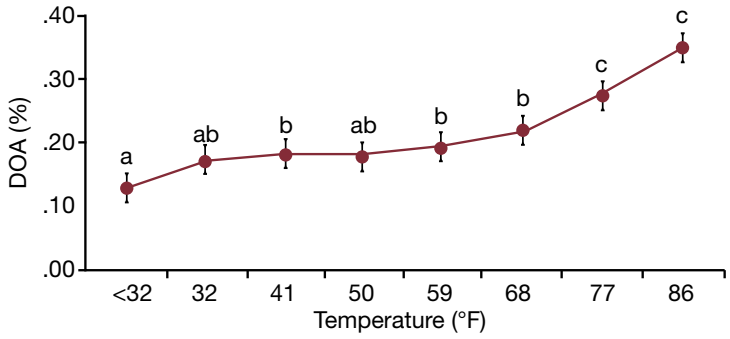
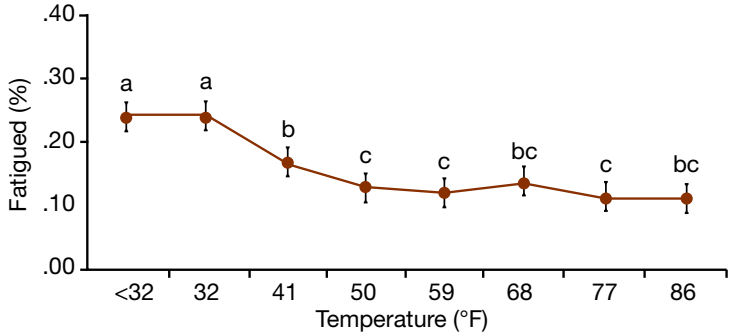
To further reduce the incidence of transport losses, it is important to be able to understand why and when they occur. While temperature is not always the primary cause for pigs becoming DOA or non-ambulatory, it can be an additional stressor. Following is a chart that shows the impact of temperature on the incidence of transport losses.[20] This means that DOA's are most likely to occur June through September and non-ambulatory pigs are most likely to occur September through February.



Percentages of pigs dead on arrival (DOA), and down on trailer or before weighing (fatigued) during their transport to the processing plant at different temperatures. Mean values with different letters are significantly different at P<0.05



MANAGING ILL, INJURED OR FATIGUED PIGS

Prevention, preparation and prompt action are keys to the proper handling of pigs. What causes a pig to become a fatigued pig is not well understood although it is known that good production practices, along with proper handling, reduce the incidence of fatigued pigs.

Prevention and Preparation

- Pigs that are ill, injured or fatigued must be handled in a humane manner
- Proper handling and movement of ill, injured or fatigued animals should be included in the general handling and movement policy of production, transportation and harvest operations
- Producers should seek to prevent illness and injuries by feeding nutritionally sound diets, maintaining effective health programs, providing good facilities, handling pigs properly and selecting genetically and structurally sound breeding stock
- A resting area can help ill, injured or fatigued pigs recover by minimizing competition for feed and water and provides the opportunity for monitoring
- Pigs that appear healthy but have a history of health or respiratory problems may be more susceptible to handling and transport stress and should be handled with extra care.

Loading

- The position of the National Pork Board is that any animal that is unable to walk, is ill or significantly injured should not be transported to market channels. Where the likelihood of recovery is low, even with treatment, the animal should be humanely euthanized
- Transporters have the right and responsibility to deny entrance of pigs exhibiting symptoms of illness, a severe injury (e.g. a broken leg) or fatigue onto a truck

Transportation

- Safety and well-being should be a primary concern when transporting pigs
- Transport can be a stressful time for pigs and even healthy animals can lose up to 5 percent of their body weight during a 4-hour transport[21]
- Pigs that become ill, injured or fatigued during transport should be segregated upon arrival and care given for their special needs
- Any animal that becomes ill, injured or fatigued during transportation to a harvest facility should be handled in a manner that is consistent with the recommendations found in the Animal Handling Guidelines published by the American Meat Institute[27]

Unloading

- Advise the receiver of any ill, injured or fatigued animals on the transport vehicle before it is unloaded
- Never throw cold water on an animal that has collapsed from over exertion. If used, water should be applied as a sprinkle
- At no time is it acceptable for a live pig to be dropped to the ground from a transport door
- At no time is it acceptable to drag a live pig
- Transporters should ask the receiving location personnel for assistance to move or euthanize any ill, injured or fatigued animals that may be on the truck

Moving an Ill, Injured or Fatigued Pig for Treatment, Rest or Recovery

- Handling methods for moving ill, injured or fatigued pigs should include equipment appropriate for the size, age and condition of the animal. When pigs become too large to be carried in a safe manner, proper tools for moving these animals should be used
- Efforts should be taken to not exacerbate and/or cause an injury to the animal. From worker safety and animal handling perspectives it is recommended that a minimum of two individuals handle ill, injured or fatigued pigs

Tools for Moving Ill, Injured or Fatigued Pigs

- Stretchers – A stretcher requires two people to gently roll the animal onto it. Handlers should hold/push at the flank and under the forelegs. To prevent dislocation and bruising the animal's legs should not be held
- Sleds – Tip the sled onto its side and roll the pig into the sled. A second handler may need to help hold the sled while the pig is rolled into it. The animal is more likely to allow itself to be pulled in the sled if it is laying on its side rather than its stomach. If a pig is rolled onto its stomach it may stand up and jump out of the sled
- Hand Carts – A cart can be modified with an enlarged platform and back board. The platform is slid under the pig or the pig is rolled onto the platform. The cart can then be tilted back to move the pig. A second handler should be present to assist in loading and steadying the pig on the platform
- Mechanized Equipment – If a skid-steer loader is used, the pig should be rolled into the bucket using the same techniques previously described. It is recommended that two handlers be used, one to operate the machine and one to roll the pig into the bucket. Loaders should be equipped with a special lid attachment on the bucket to prevent the pig from jumping or falling out. As in all other methods, the pigs must be off-loaded by gently rolling or lifting them out of the bucket. Loading pigs into the bucket using a wall, partition or fence is not acceptable

NOTES:

5 BIOSECURITY

Swine diseases cause economic losses to pork producers. Porcine reproductive and respiratory syndrome (PRRS) alone cost the industry over $560 million dollars annually according to a study published in 2005. Add in the losses from other diseases such as circovirus (PCVAD), swine influenza virus and Mycoplasma, and the dollars lost continue to add up. Producers also face risks to their bottom line in the event that a foreign animal disease such as foot-and-mouth disease (FMD) or Classical Swine Fever is introduced. Both of these are highly contagious diseases that will result in the loss of export markets for pork and pork products and restrict the local and interstate movement of pigs until the disease is contained and eradicated.

THE BIOSECURITY MINDSET

Pork producers face daily challenges to maintain and improve the health of their herds. This is no small task considering the numerous opportunities for diseases to enter a herd. However, in the face of these risks lie opportunities for those involved in pork production to come together to play critical roles in disease prevention.

The people and companies that transport pigs play an important role in the profitability of the pork industry. Whether it is transporting pigs to harvest or moving pigs between farms with two- or three-site production, transportation services are vital to the industry today.

All stakeholders involved in pork production from producers and their employees to veterinarians and transporters need to focus on developing a biosecurity mindset that will help them make good decisions when it comes to practices that reduce the risk of disease introduction and spread.

The mindset begins with people understanding that they have a personal responsibility to do their part regardless of their role in pork production. All movement of pigs, people, vehicles and equipment on and off a production site provide the opportunity for a disease to infect a site, especially when steps to reduce the risk are not taken, or ignored. Those who become complacent because “nothing bad has happened yet” or have not seen the direct effects of a disease outbreak continue to represent one of the greatest risks to herd heath. Practicing good biosecurity is not hard but it is often viewed as inconvenient, resulting in protocols being ignored and corners being cut putting herds at risk.

Developing a biosecurity mindset and accepting responsibility are ways that value is added to the pork industry. The incorporation, enforcement and level of biosecurity procedures differ by site and management. The lack of biosecurity protocols does not mean it should be ignored. Protocols that are provided for transportation biosecurity should be abided by regardless of the level of enforcement. In the absence of a defined protocol, good biosecurity practices should still be incorporated by transporters to reduce the risk of disease spread between herds. A clean truck, trailer and transporter go a long way towards reducing the risk of disease spread and should always be considered the best option in the absence of a defined protocol. The transporter should also observe any downtime as required by loading and unloading locations.

The economic effects of an FMD outbreak in the United States has been estimated at 14 billion dollars or 9.5 percent of U.S. farm income. Losses in gross revenue for live swine and pork in the U.S. were estimated at 34 percent and 24 percent respectively.

Paarlberg, P.L., Lee, J.G., and Seitzinger, A.H. (2002).

Potential revenue impact of an outbreak of foot-and-mouth disease in the United States. Journal of the American Veterinary Medical Association, 220(7):988-992.

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Diseases Like to "Hitch a Ride"

When present in a herd the organisms that cause disease in pigs (bacteria, viruses and parasites) do a pretty good job of taking advantage of situations where they can "hitch a ride" to the next herd. Many organisms can survive in organic matter (shavings, manure and water) carried on boots, clothing, tires, undercarriages, trailers, shovels, sorting panels and people. It is very important to understand that diseases can move between herds the same way as pigs, people, vehicles and equipment move between herds.

Think of Every Site as Being Different

There are many different strains of porcine respiratory and reproductive syndrome (PRRS). That means that the PRRS virus on one site may not be the same strain on another site even if they are both in the same production system. The potential variation of disease organisms in a herd combined with production practices, like vaccination, used to protect herd health is one of the reasons that separate herds are considered to have a separate health status. One of the primary goals of biosecurity is to prevent a change in a herd's health status caused by disease introduction. Trucks, trailers and drivers that enter a site clean help to reduce the risk of disease spread between sites.

Animal Concentration Points, Commingling and Backhauling Livestock Increase Risk

When pigs are moved to concentration points such as buying stations, packing plants and exhibitions, there is an increased risk for the contamination of trucks, trailers and drivers with organic materials that contain disease-causing organisms. Cleaning, disinfecting and drying trailers and cleaning of tractors as well as strict attention to driver biosecurity practices that prevent boots, coveralls and hands contaminated with organic materials from exposing other sites are particularly important.

BASIC GUIDELINES FOR SANITATION, DISINFECTION, DRYING AND DOWNTIME

Cleaning

Proper cleaning prior to disinfection is a key method of preventing the introduction of disease on the farm. The truck and trailer must be thoroughly cleaned, washed, disinfected and completely dried after being unloaded and before being loaded again. All equipment including the trailer should be free of visible manure, shavings or dirt prior to disinfection. Different cleaning products and wash soaps are available to help break up the fats and other organic materials in a more timely manner than just using water alone.

Basic Cleaning Protocol

1. Remove (scrape/sweep) all manure, bedding and other debris from the trailer
2. Soak prior to washing to reduce wash time
3. Remove, clean and disinfect panels used to protect animals during cold temperatures
4. Use hot water to wash and a high-pressure power washer for best results
5. Wash all cracks and crevices, make certain to spray floor support members
6. Wash the top deck first then the bottom deck, always
7. Wash the undercarriage, wheels, floor mats, pens, storage boxes and driving/handling aides
8. Remove excess water from the truck/trailer by parking on a 2-3 percent slope (minimum for proper wastewater drainage) when finished washing
9. Remove any trash and vacuum interior of the tractor cab
10. Wipe down or spray disinfectant on the floor mats and steering wheel
11. Keep only clean and unused clothing and equipment in the cab of the tractor. Keep new trash bags handy for storage of all used items and place in the side box located on the trailer after use.

Disinfection

Disinfectants should be used on trucks and trailers after they have been cleaned because organic materials will inactivate and reduce the effectiveness of most disinfectants. It is important to choose the appropriate disinfectants based on the diseases that you are trying to prevent. Disinfectants should also be chemically compatible with any cleaning product or wash soap that is being used. Different chemicals can either reduce the effectiveness of the disinfectant or produce a harmful chemical reaction when combined. It is also essential to following label directions when using disinfectants to ensure the disinfectant is being used at the proper concentration, temperature and the appropriate contact times are being observed. Failure to select and use disinfectants properly will decrease their effectiveness in disease prevention and can pose a risk to human health.

Drying and Heat

Drying helps support the inactivation of disease agents. Supplemental heat is becoming popular at some truck washes as a means to disinfect trailers. Heat delivered to a trailer at the appropriate temperature and over the right period of time can be effective against many swine diseases. Trucks and trailers should be cleaned, disinfected and allowed to dry completely before being loaded with a new group of pigs.

RESOURCES

Resources pertaining to biosecurity and livestock production can be found online at *pork.org* and at the National Biosecurity Resource Center at *biosecuritycenter.org.* Transporters can find guidance on boot disinfection, actively search for disinfectants by manufacturer, disinfectant class or by disease, or locate truck washes by State. Additional information on biosecurity can be found online at Iowa State Center for Food Security and Public Health at *cfsph.iastate.edu.*

NOTES:

6 EMERGENCY RESPONSE PLAN

Even though the goal of each transporter is to get the animals to their destination safely and in a timely manner, risk factors do exist with each load transported. Transporters must not only make themselves aware of these risk factors, but they must also have a plan in place to deal with them if they should occur. By being prepared, the transporter will be able to respond in an effective manner and lessen the impact of the delay or accident on the animals and on themselves.

TRANSPORTER'S RESPONSIBILITIES IN AN EMERGENCY

Even in the event of an emergency, transporters have a responsibility towards the animals, the company and the U.S. pork industry. These responsibilities include:

- Being aware and prepared to handle emergencies
- Ensuring the transporter's personal safety and an awareness of public safety
- Responding to the situation professionally
- The well-being and humane treatment of the animals
- The protection of company property (e.g. the animals, equipment)
- Projecting a positive perception of the company and the industry

EMERGENCY PLANS FOR DELAYS

Ideally, pigs will arrive at their destination in a timely manner with minimal added stress. Unfortunately, during the movement of pigs, many situations can arise that can cause a load to be delayed. These delays can include: weather, traffic issues, motor vehicle accidents, road construction, mechanical breakdowns or plant shutdowns. Remember, the goal of everyone involved in the scheduling process (producer, transporter, director of procurement and dispatcher) is to minimize the time that pigs must remain on a trailer.

Prevention

Some delays can be avoided if the transporter is prepared ahead of time.

- Investigate the travel route before departure to determine if road construction is in progress
- Check the weather conditions on the route. Avoid driving during bad weather if possible
- Perform routine maintenance and inspect the tractor-trailer before each trip
  a. If there are any mechanical or structural issues, they must be repaired before beginning the trip
  b. If the vehicle has just returned from repair, ensure all repairs were performed adequately
- Avoid rush-hour traffic when possible
- Listen to local radio stations and CB radios for traffic and road conditions along the route

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Preparedness

All transporters need to be prepared for what they will do in each of the situations listed previously. Preparedness may not only help avoid a delay, but may also shorten the length of an unavoidable one.

- Establish and understand company policy of what to do in the case of a delay
- Become familiar with alternate routes in case of traffic delays or road construction
- Have the contact numbers for the destination (e.g. plant, farm)
- Have tools/parts available on the truck to repair minor mechanical problems
- Identify locations and contact numbers for auctions and fairgrounds located along the transport route where pigs could be unloaded during an emergency

If a delay occurs

- The well-being and safety of the animals must be considered at all times. It is the transporter's responsibility to do his or her best to keep the animals comfortable and safe
- During any delay, the transporter must constantly monitor the comfort and condition of the pigs
- Animals must be protected from extreme weather conditions. In cold weather, when possible, the trailer should be parked in an area that provides protection from the wind. Extra weather boards should be added, if necessary and if available, to keep wind or freezing rain off pigs. In high temperature conditions, when possible, the trailer should be parked in an area that provides shade and allows for a breeze to pass through the sides of the trailer. If water is available, wet the pigs to keep them cool. If water is unavailable and weather conditions require wetting of the pigs, the transporter may be able to contact the local fire department to have them come and wet the pigs with water from a fire truck
- The transporter should contact the origination and the destination contact to inform them of the nature of the delay and determine the best plan of action for themselves and for the well-being of the animals
- In the case of a mechanical breakdown of the tractor, determine the nature of the breakdown and estimate how long the repairs will take. If the repairs cannot take place at the site of the breakdown or they will take an extended period of time, arrange for another tractor to be sent to take the trailer. Numerous factors need to be taken into consideration when determining how long pigs can safely be left on a stationary trailer:
    - Weather – (e.g. Pigs will do fine on a trailer for four hours in cool, low humidity weather. In extreme summer heat and humidity, they will experience heat stress quite quickly.) See Chapter 3 for the livestock weather safety index
    - Fitness of the animals
    - Age of animals
    - Time already off food and water (e.g. The pigs have been in the transportation process for 18 hours)
    - Location of the delay (e.g. rural area vs. freeway)
    - Time of day
    - Safety of animals at current location

- If the problem is with the trailer, or if the unit is a straight truck, and it cannot be repaired on the road, the pigs must be transferred to another unit to complete the journey. There are several considerations when transferring animals to another trailer:
  - Assess the safety of the location. If it is a heavy-traffic area or on a narrow road, have the unit towed to a safe area for transfer if possible
  - Can another semi-trailer maneuver close enough to do an end-to-end load or will a portable loading ramp be needed requiring the pigs to be off-loaded into an open area and then reloaded? There may be circumstances where only smaller stock trailers can get to the disabled unit
  - If the pigs must be off-loaded and reloaded, ensure proper containment is available to hold the pigs between trailers
  - Before any action takes place, call the local police or fire department for assistance with traffic
- In the instance of plant shutdowns:
  - Keep in contact with the plant dispatcher
  - The processor will most likely communicate to producers and transporters that they need to postpone deliveries and prevent long waits at the plant when possible
  - In most instances, the plant may provide guidance as well as equipment to keep loaded pigs as comfortable as possible
  - The length of the plant shutdown will help determine the appropriate course of action
- In the case of road construction, the transporter should investigate if there are any alternate routes. If there is concern about the well-being of the pigs, the transporter should contact the local authorities and explain the animal situation in an attempt to gain permission to move through or receive assistance to turn around
- If the delay is caused by bad weather or poor road conditions, the truck should be pulled over in a safe area, preferably where the animals will be protected from as much of the weather as possible. The transporter should park the truck as far away from other traffic as possible to reduce the risk of other vehicles hitting the unit

ACCIDENTS

Unfortunately, motor vehicle accidents involving livestock do happen. These incidents are extremely dangerous and stressful for transporters, first responders and the animals. By being prepared for an accident before it happens, and understanding how to effectively respond to an incident involving livestock, the well-being and safety of all involved will improve dramatically. Economic losses can also be greatly reduced when everyone involved is prepared for an accident and they are able to respond in an efficient and effective manner.

Commercial Livestock Transportation Accident Statistics[22]

- **59 percent of accidents occurred between 12:00 Midnight and 9:00 a.m.**
- **27 percent of the accidents documented were swine. Of these, 80 percent involved finished/market hogs**
- **84 percent of the trailers rolled on the right-hand side**
- **80 percent were single-vehicle accidents**
- **85 percent were caused by transporter error**

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Accident Prevention

The results of a recent study of commercial livestock transportation accidents lead to the conclusion that most of the accidents are caused by transporter fatigue.[22] Due to weather conditions, plant scheduling, transporter shortages and relocation distances, it is often necessary for livestock to be moved during the late evening and early morning hours. Road crash numbers have shown that though there are fewer transporters on the road between midnight and 6 a.m., transporters are more likely to have accidents during this time period. Additionally, a study in Australia showed that fatigue is more of a problem on country roads, than towns or cities.[23] Other accident causes include transporter distractions, speed/poor driving habits and inadequate vehicle maintenance.

Preventing Transporter Fatigue - *Fatigue management is the responsibility of both the transporter and management. In order to manage fatigue, it must first be understood.*

Fatigue is defined by the loss of alertness (slower reflexes), drowsiness (feeling sleepy), falling asleep, poor memory and irritability (more reactive). It is caused by body-clock conflict, poor sleep patterns, long work hours and poor-health factors. Research shows that night-shift transporters get about two hours of sleep less per day than day-shift transporters do.

The following tips can help to prevent fatigue:

1) Ensure sufficient sleep is obtained each day. Seven and one-half hours is commonly recognized as the normal amount of required sleep. A short night's sleep should be made up for the next night by sleeping a little longer. Transporters should work with management to provide a schedule that allows for the proper amount of sleep. The only cure for fatigue is sleep
2) Ensure a good sleep environment at home. Keep rooms cool, turn off the phone, wear earplugs and block out daylight with dark shades or a sleep mask
3) Stick to regular sleep and wake periods – even on days off
4) Eat a balanced diet and have regular meal times. Drink plenty of water and exercise. Regular medical check-ups are important
5) If a transporter feels too drowsy to drive, he/she should pull over and contact the dispatcher and/or the plant to inform them of the situation
6) If feeling drowsy, take frequent breaks to stop and stretch for 5 minutes. This is also a good time to do a quick check of the animals on board
7) Do not take over-the-counter stimulants to ease drowsiness
8) Keep the truck cab comfortable, but not too warm. Heat may make a person feel tired. Allow fresh air into the cab and turn on the radio or play music

9) **Learn to recognize the signs of fatigue**
   - a. **Cannot keep head up**
   - b. **Eyes won't stay open or go out of focus**
   - c. **Drift over the center line or the shoulder line**
   - d. **Thoughts wander**
   - e. **Miss a road sign, exit or a gear**
   - f. **Don't remember passing certain landmarks or towns**
   - g. **See things that are not there**
   - h. **Reflexes begin to slow**

Speed and Careless Driving

- Speed must be monitored at all times. Posted speed limits should be observed and speeds adjusted for current road, weather and traffic conditions
- Do not tailgate, play road games with other transporters, pass illegally or attempt to beat traffic lights or railroad crossings
- A transporter must always be aware of the hazards of driving on farm roads as they are often narrow, with soft shoulders that may collapse under the weight a heavy truck. Do not allow the truck or trailer to get too close to the edge of the ditch while driving down the road or turning in or out of driveways
- Erratic driving and cornering at high speeds can cause the animals to shift. This shift in weight can cause the trailer to tip. Extra caution should be taken on highway entrance and exit ramps.

Transporter Distractions

- The transporter must be alert at all times to his/her driving and those driving nearby
- Distractions must be avoided at all times. This includes, but is not limited to, eating, drinking, talking on the phone, reading, texting and reaching for items on the floor or across the seat

Preparation

In order to be properly prepared for an accident, each transport vehicle should contain the following:

- Emergency contact sheet with 24-hour phone numbers for dispatch, destination point and insurance companies
- Emergency warning devices (e.g. flares, emergency triangles)
- Camera
- Accident information sheet
- Company accident policy sheet/Standard Operating Procedures, if one exists
- Fire extinguisher
- Spill kit

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In the Event of an Accident

If uninjured and able to do so, the transporter should:

1. Call 911 if the accident occurs on a public roadway or if emergency assistance is required for an on-farm accident. Advise operator of:
   - The location of the accident
   - The fact that you have animals on-board
   - The status of any loose animals
   - Any known hazards
2. Set out emergency warning devices within 10 minutes of accident
3. Call the designated company contact. If the company has a dispatch checklist for accidents, proceed through list. If not, inform the dispatcher of the location of the accident, if there are any injuries, condition of animals, position of trailer, number of vehicles involved and if first responders are on scene yet
4. Call other designated contacts according to company protocol. These could include but are not limited to the insurance companies for the cargo and the vehicle and the destination, and provide them with the same information
5. If the tractor and/or trailer are damaged and unable to move, proceed to point 6. If damage is minor, the trailer is upright and there are no injuries, take photos and record names and addresses of other people involved and witnesses
6. Herd any loose pigs from the road and gather them in an area as far away from traffic as possible
7. Locate accident reporting kit and camera. Take photos of accident as soon as possible. Photographs should include photos of road conditions, vehicle damage, trailer position, the overall accident scene, skid marks, curves, intersections and where the vehicle left the road (if it did)
8. Provide as much protection and comfort for the animals as possible
9. Release statements only to people of authority. The transporter must remember that at this point he or she is the most visible company and pork industry representative and the transporter must conduct himself or herself as such
10. When first responders arrive, the transporter should advise them of accident details including any human injuries, the status of any loose animals, any known hazards and the company's emergency response plan. If available, the transporter should let the authorities know if a company rescue trailer and animal handling personnel are on the way and their estimated time of arrival. Transporters must respect the chain of command at all times

EMERGENCY CONTACT SHEET EXAMPLE:

911 is a standard service nearly everywhere and will typically result in faster service than calling the police, fire or an ambulance directly.

EMERGENCY CONTACTS

Police _____ **911**
Fire _____ **911**
Ambulance _____ **911**
Company Dispatch _____
24-Hour Accident/Emergency Line _____
Plant _____
Other Common Destination _____
Insurance Company _____
Other _____

7 LAWS, REGULATIONS AND AUDITS

Transporters must understand and follow laws and regulations governed by federal, state and local authorities including the Department of Transportation (DOT), Food Safety and Inspection Service (FSIS) and United States Department of Agriculture (USDA).

TRANSPORTATION OF ANIMALS: 28-HOUR LAW

The following list contains a few pertinent sections of the Transportation of Animals statute from the U.S. Code that deals with the maximum time animals may be held in a transport vehicle without being unloaded for food, water and rest. 49 USC Sec. 80502[24]

Sec. 80502

(a) Confinement.

(1) Except as provided in this section, a rail carrier, express carrier, or common carrier (except by air or water), a receiver, trustee, or lessee of one of those carriers, or an owner or master of a vessel transporting animals from a place in a State, the District of Columbia, or a territory or possession of the United States through or to a place in another State, the District of Columbia, or a territory or possession, may not confine animals in a vehicle or vessel for more than 28 consecutive hours without unloading the animals for feeding, water, and rest.

(2) Time spent in loading and unloading animals is not included as part of a period of confinement under this subsection.

(b) Unloading, Feeding, Watering and Rest.

Animals being transported shall be unloaded in a humane way into pens equipped for feeding, water, and rest for at least 5 consecutive hours. The owner or person having custody of the animals shall feed and water the animals. When the animals are not fed and watered by the owner or person having custody, the rail carrier, express carrier, or common carrier (except by air or water), the receiver, trustee, or lessee of one of those carriers, or the owner or master of a vessel transporting the animals -

(1) Shall feed and water the animals at the reasonable expense of the owner or person having custody, except that the owner or shipper may provide food;

(2) Has a lien on the animals for providing food, care, and custody that may be collected at the destination in the same way that a transportation charge is collected; and

(3) Is not liable for detaining the animals for a reasonable period to comply with subsection (a) of this section.

(c) Nonapplication.

This section does not apply when animals are transported in a vehicle or vessel in which the animals have food, water, space and an opportunity for rest.

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(d) Civil Penalty.
A rail carrier, express carrier, or common carrier (except by air or water), a receiver, trustee, or lessee of one of those carriers, or an owner or master of a vessel that knowingly and willfully violates this section is liable to the United States Government for a civil penalty of at least $100 but not more than $500 for each violation. On learning of a violation, the Attorney General shall bring a civil action to collect the penalty in the district court of the United States for the judicial district in which the violation occurred or the defendant resides or does business.

FSIS inspectors have been instructed to identify livestock that appear exhausted or dehydrated upon arrival. They may ask the transporter or plant to provide documentation of transport duration and compliance with the 28-Hour Law.

HUMANE SLAUGHTER OF LIVESTOCK ACT

The following list contains a few of pertinent sections of the Humane Slaughter of Livestock Act as described by the regulations in 9 CFR 313.[25]

Sec. 313.50 *Tagging of equipment, alleyways, pens, or compartments to prevent inhumane slaughter or handling in connection with slaughter.*

When an inspector observes an incident of inhumane slaughter or handling in connection with slaughter, he/she shall inform the establishment operator of the incident and request that the operator take the necessary steps to prevent a recurrence. If the establishment operator fails to take such action or fails to promptly provide the inspector with satisfactory assurances that such action will be taken, the inspector shall follow the procedures specified in paragraph (a), (b), or (c) of this section, as appropriate.

(a) If the cause of inhumane treatment is the result of facility deficiencies, disrepair, or equipment breakdown, the inspector shall attach a “U.S. Rejected” tag thereto. No equipment, alleyway, pen or compartment so tagged shall be used until made acceptable to the inspector. The tag shall not be removed by anyone other than an inspector. All livestock slaughtered prior to such tagging may be dressed, processed, or prepared under inspection.

(b) If the cause of inhumane treatment is the result of establishment employee actions in the handling or moving of livestock, the inspector shall attach a “U.S. Rejected” tag to the alleyways leading to the stunning area. After the tagging of the alleyway, no more livestock shall be moved to the stunning area until the inspector receives satisfactory assurances from the establishment operator that there will not be a recurrence. The tag shall not be removed by anyone other than an inspector. All livestock slaughtered prior to the tagging may be dressed, processed, or prepared under inspection.

Sec. 313.1 *Livestock pens, driveways and ramps.*

(a) Livestock pens, driveways and ramps shall be maintained in good repair. They shall be free from sharp or protruding objects which may, in the opinion of the inspector, cause injury or pain to the animals. Loose boards, splintered or broken planking, and unnecessary openings where the head, feet, or legs of an animal may be injured shall be repaired.

(b) Floors of livestock pens, ramps, and driveways shall be constructed and maintained so as to provide good footing for livestock. Slip-resistant or waffled-floor surfaces, cleated ramps and the use of sand, as appropriate, during winter months are examples of acceptable construction and maintenance.

(d) Livestock pens and driveways shall be so arranged that sharp corners and direction reversal of driven animals are minimized.

Sec. 313.2 *Handling of livestock.*

(a) Driving of livestock from the unloading ramps to the holding pens and from the holding pens to the stunning area shall be done with a minimum of excitement and discomfort to the animals. Livestock shall not be forced to move faster than a normal walking speed.

(b) Electric prods, canvas slappers, or other implements employed to drive animals shall be used as little as possible in order to minimize excitement and injury. Any use of such implements which, in the opinion of the inspector, is excessive, is prohibited. Electrical prods attached to AC house current shall be reduced by a transformer to the lowest effective voltage not to exceed 50 volts AC.

(d) Disabled livestock and other animals unable to move.

(1) Disabled animals and other animals unable to move shall be separated from normal ambulatory animals and placed in the covered pen provided for in Sec. 313.1(c).

(2) The dragging of disabled animals and other animals unable to move, while conscious, is prohibited. Stunned animals may, however, be dragged.

(3) Disabled animals and other animals unable to move may be moved, while conscious, on equipment suitable for such purposes; e.g., stone boats.

"Once a vehicle carrying pigs enters an official slaughter establishment's premises, the vehicle is considered to be a part of that establishment's premises. The animals within that vehicle are to be handled in accordance with section 313.2 of the Humane Slaughter of Livestock Act." [26]

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HARVEST PLANT AUDITS

To help ensure good animal well-being during transport and harvest, pigs must be handled by well-trained people. Given that people can manage what they measure, several auditing systems have been put in place to assess (numerically) if there are **people** problems, **animal** problems, or a **facility** problem.

The American Meat Institute has developed audit criteria for animal handling and slaughter at the harvest plant. Auditors will evaluate trailers arriving and unloading at the plant as well as animal handling and slaughter in the plant. The criteria that will be evaluated include:[27]

1. Plant transportation policy and preparedness for receiving animals
    a. Plant has written animal welfare policy for transporters
    b. Plant provides extreme temperature management tools (water, fans, etc.)
    c. Have arrival-management process that minimizes waiting time at the plant
    d. Emergency plans in place for animals in transit
    e. Written policy for immobile and fatigued animals and tools available for handling
    f. Acceptable handling tools available and utilized as needed
    g. Availability of acceptable euthanasia tools
    h. Maintenance records for euthanasia equipment, proper storage and employee training for euthanasia
    i. Gates in unloading area swing freely, latch securely and have no sharp protrusions
    j. Non-slip flooring
    k. Unloading area and ramps in good repair (e.g. no broken cleats, holes or gaps)
    l. Adequate lighting in the unloading area
    m. Staff available for receiving animals
2. Set-up and Loading of Trailer
    a. Compartments are gated
    b. Trailer loaded at proper density
    c. Incompatible animals segregated when required (e.g. boars and sows)
3. Timeliness of Arrival of the Truck and Trailers and Animal Unloading
    a. Time between trailer arrival and start of unloading
4. Condition of Trailer
    a. Trailer is properly aligned with the unloading area
    b. Trailer has solid flooring that is non-slip
    c. Gates and doors open freely and can be secured shut
    d. Internal ramps function properly and extend all the way to the floor
    e. No sharp or protruding objects that can injure the animals
    f. Bedding in the trailer for insulation and to prevent slipping
    g. Winter side slats or plugs are in place at recommended levels

5. Falls
    a. Counting the number of animals that fall in the unloading area (all four limbs are on the unloading ramp or dock)
    b. Temperament of the livestock (normal moving or difficult to move)
    c. The person doing the unloading did so quietly and calmly
6. Electric Prod Use
    a. Measure the number of times an electric prod was used in the unloading area (all four limbs are on the unloading ramp or dock)
    b. Did the driver use the electric prods on the livestock in the trailer, through the sides or roof of the trailer?
    c. Were rattle paddles, sort boards, flags, or other handling tools used incorrectly?
7. Condition of the Animal
    a. Number of compromised animals on the trailer
    b. Number of non-ambulatory pigs on the trailer
    c. Number of pigs with severe injuries (broken legs, bleeding gashes, or deep, visible cuts, prolapses, and body pressure sores
    d. Number of fatigued pigs
    e. Number of pigs with frostbite
    f. Number of dead animals on the trailer
    g. Plant communication back to the origination site
    h. Number of animals considered emaciated or in poor body condition
8. Willful Acts of Abuse – defined as:
    a. Dragging a conscious, non-ambulatory animal
    b. Intentionally applying prods to sensitive parts of the animal such as eyes, ears, nose, anus or testicles
    c. Deliberate slamming of gates on livestock
    d. Malicious driving of ambulatory livestock on top of one another either manually or with direct contact with motorized equipment. (this excludes loading a non-ambulatory animal for transport)
    e. Hitting or beating an animal
    f. Live animals frozen to the floor or sides of the trailer

FINISHING PIG LOAD-OUT ASSESSMENT

The following assessment has been developed for use during finishing pig load-out. It can be used as a tool to help identify areas of improvement in animal handling skills, equipment and facilities, and transport preparation. This assessment begins in the barn just prior to load-out and ends at the farm gate. When completed, any assessment results marked in the shaded boxes should be reviewed and addressed with the drivers and animal handlers.

Preparation	**YES**	**NO**
1. Valid TQA certification for Driver: Valid TQA certification for Load crew		
2. Driver has the following records in their cab: Emergency action plan Contact info for origination/dispatch Contact info for destination/dispatch Bill of lading Offload/rest plan if to be transported longer than 28 hours		
3. Load crew is prepared and ready to load at scheduled time		
4. Driver is prepared to load at scheduled time of pick-up		
5. Driver knows the scheduled delivery time		
6. Does the driver leave within 15 minutes after loading?		
7. Load crew knows the plan for how to handle pigs that become non-ambulatory in the loading process		
8. It is predetermined how many pigs (determined by trailer dimensions, pig weight and weather conditions) will be loaded onto the trailer		
9. Driver is aware of biosecurity protocol of the site		
Facilities/Equipment	**YES**	**NO**
10. Facilities (including alleyway, flooring, chute, and ramp) are in good state of repair so as not to cause injury to the pigs Comment on areas:		
11. Trailer (including sides, flooring, ramps and gates) is in good state of repair so as not to cause injury to the pigs Comment on areas:		
12. Does the driver have the trailer boarded according to TQA recommendations and plant policy?		
13. Does the driver know the plant requirements for boarding and bedding?		
14. Water is available for misting on the trailer if necessary due to weather conditions		
Handling/Loading	**YES**	**NO**
15. Pigs are moved at a normal walking pace		
16. Does everyone loading pigs have a panel?		
17. Are electric prods the only handling tool being used? Is the electric prod being used incorrectly? Are electric prods used in the pens?		
18. Are handling tools/equipment used correctly?		
19. Pigs are handled gently (no overuse, or improper use of electric prods; no loud noises and yelling; not moving pigs too fast; not moving too many pigs per group; overcrowding pigs in chutes, ramps and alleyways; and no rough physical contact)		
20. Are any pigs that are unable to walk, are ill or are significantly injured transported to market channels?		
21. Are there areas (i.e. lighting, shadows, contrast, temperature, transitions, wind, etc.) that cause pigs to balk during the loadout process? Comment on areas:		

FINISH PIG LOAD-OUT ASSESSMENT (continued)

22. Do more than 1% of the pigs handled fall during loading? Falling is defined as when a pig loses an upright position suddenly in which part of the body other than the limbs touches the ground.		
In-Transit	**YES**	**NO**
23. Driver has the ability to adjust trailer ventilation during the journey if necessary (boards are adjustable/removable, plugs are not)		
Willful Acts of Abuse	**YES**	**NO**
24. Were any willful acts of abuse observed? Willful abuse is defined as acts outside of normally accepted production practices that intentionally cause pain and suffering including, but not limited to: - prodding in sensitive areas (eyes, ears, genitals, rectum, nose) - dropping or driving live animals from a suspended height - deliberate slamming of gates, doors, etc. on animals - purposeful driving of livestock on top of non-ambulatory or dead animals - malicious hitting/beating an animal		

TERMS

Ambulatory: a pig that is able to stand unaided and can bear weight on each leg.

Biosecurity: practices that reduce the risk of disease introduction and spread.

Dead on Arrival (DOA): pigs that die before or upon arrival at the plant.

Ethical Principles: U.S. pork producers' commitment to produce safe food, protect and promote animal well-being, safeguard natural resources in all of their practices, ensure their practices protect public health, provide a work environment that is safe and consistent with their other ethical principles, and contribute to a better quality of life in their communities.

Euthanasia: the humane process whereby the pig is rendered insensible, with minimal pain and distress, until death.

Handler: Anyone who is in physical contact with a pig and interacts with it in a manner that causes the pig to move. This includes Transporters when they are physically moving pigs on foot instead of driving a vehicle.

Fatigued: A fatigued pig is defined as having temporarily lost the ability to walk but has a reasonable expectation to recover full locomotion with rest.

Flight zone: an imaginary circle around an animal that it considers its individual space.

Food Safety and Inspection Service (FSIS): A branch of the U.S. Department of Agriculture that is responsible for inspecting all pigs and sanitation levels at packing plants.

Non-ambulatory: a pig that is unable to stand unaided and bear weight on each leg.

Point of balance: is located at a pig's shoulder. If a handler enters a pig's flight zone, the pig will move: forward if the handler approaches from behind the point of balance; backwards if the handler approaches from in front of the point of balance.

Transport losses: Transport losses refer to those pigs that die (DOA) or become non-ambulatory during handling or transport.

Transporter: An individual animal handler who controls a piece of equipment that transports pigs, including truck drivers, tractor drivers using a hog cart, etc.

We Care Initiative: A joint effort of the Pork Checkoff, through the National Pork Board, and the National Pork Producers Council which helps demonstrate that producers are accountable to established ethical principles and animal well-being practices.

Willful acts of neglect or abuse: Willful neglect and abuse are defined as acts outside of normally accepted production practices that intentionally cause pain and suffering. This includes, but is not limited to, malicious hitting or beating an animal or using an electric prod in sensitive areas such as eyes, nose, anus, testicles, etc.

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National Pork Board
1776 N.W. 114th St.
Des Moines, IA 50325 USA

#04752-01/08

ATTACHMENT 2

Date	Procedure	Result	NR#	Insp.	Shift	Appeal (Yes)	Open (Yes)	Reported To
2/16/2005	04C02	I	0002-2005-5496	[redacted]	1			[redacted]

Today while performing unscheduled procedure O4CO2 at Riverside Meats the following was noted by the IIC, at about 1: 30 pm. In the livestock holding pen area there are several pens that have bent, loose, and sharp edges of the wire fence being used that is in need of repair. Thus creating an environment that could result in accidental injury or discomfort to the livestock being held for slaughter. The pens are number (1,2,3,4,the unloading ramp area, and the gate on pen number 7. It was noted that on this day there was no slaughter being performed, and that pens 1,2,3,4, were not being used. [redacted] was notified of the findings as listed above and advised of the failure to meet regulatory requirement 313.1(a). Which states that livestock pens, driveways and ramps shall be maintained in good repair. They shall be free from sharp or protruding objects which may, in the opinion of the inspector, cause injury or pain to the animals. No tag was used due to the fact that there were no animals affected at this time. This serves as written notification of Protocol noncompliance. This document also serves as written notification that your failure to comply with regulatory requirements could result in additional regulatory action or administrative action.

3/9/2006	04C02	I	0003-2006-5496	[redacted]	1			[redacted]

On 3/9/2006 at about 7:10 am while performing ante-mortem inspection in the hog pens at River Side Meats the following noncompliances were noted by the IIC ([redacted] nd [redacted] VMO). (1) There was a hog in pen number one with no access to water (approximately 200 pound hog). (2) It was also noted in pen number two (two cows, approximately 1200 to1600 pounds each) that had no access to water. Continuing with the ante-mortem inspection there was a downer hog in pen number seven with seventeen other hogs. This hog was about forty-five pounds, and the other hogs were all of a larger size. When moving around in the pen the other hogs would occasionally step on the downer hog, and he would yell. This animal was lying on it's right side, and was unable to stand. He could move his feet, but was not moving it's head at all. [redacted] VMO) left to advise someone that there was a downer hog in pen number seven. He ([redacted] tated that he had told [redacted] bout the hog. About two minutes later I could hear Dr. [redacted] tell someone to stop moving that hog. While I had continued with the checking of the other hogs, a Hispanic employee had gotten hold of the hog's leg and was going to drag him out of the pen. (3) I turned to see the employee drop the hogs leg. The hog was about two feet from where he was to start with. [redacted] then left the pen area for a second time to advise someone of the downer hog. He returned and told me that he had spoken with [redacted] and that he was going to get the captive bolt gun. Shortly after that [redacted] then entered the hog pen and promptly rendered the hog unconscious, unresponsive. The hog was then removed from the pen area by an employee. [redacted] was advised of the animals without access to water, and he promptly put a container in each pen and provided water access. No tag was used due to prompt action being taken to correct the water situation. The immediate action taken in regards to the downed hog was to stop the employee from moving the hog any further, and to notify management for a second time. I was uncertain if the Spanish employee was acting on his own or not. That is why the establishment was allowed to continue getting ready to start the kill. These are failures of the plant to meet the Cod of Federal Regulations (313.2(1), 313.2(2) and 313.3(e). [redacted] Plant's Owner was advised of the failures to comply. This document serves as written notification of a protocol noncompliance.

7/13/2006	04C02	I	0009-2006-7280	[redacted]				[redacted]

ON JULY-13-2006 AROUND 07:20 AM WHILE PERFORMING ANTEMORTEM IN THE HOG PENS THE FOLLOWING NONCOMPLIANCE WAS NOTED BY THE IIC THAT IN PEN 9 & 10 THE HOGS WERE SLIPPING AND FALLING SOME HAD PROBLEM GETTING UP DUE TO THE SLICK FLOOR.THIS WAS CREATING AND ENVIRONMENT THAT THE HOGS COULD GET INJURED POSSIBLE BREAKING BONES.HAD EMPLOYEE TO STOP AND REMOVE THE HOGS FROM PEN 9-10-11-12 AND TAG(383355) THESE PENS UNTIL THIS PROBLEM IS CORRECTED.ACCORDING TO 313.1 (b) AND(04C02)OF THE HUMANE HANDLING WHICH STATE THAT FLOOR OF LIVESTOCK PENS,RAMPS, AND DRIVEWAYS SHALL BE CONSTRUCED AND MAINTAIINED SO AS TO PROVIDE GOOD FOOTING FOR LIVESTOCK. SLIP RESISTANT OR WAFFLED FLOOR SURFACESTO PREVENT INJURED TO THE ANIMALS.NOTIFIED MR ROBERT SMALL PLANT OWNER AND [redacted] KILL FLOOR SUPERVISOR OF THE NONCOMPLIANCE (04C02) (313.1 (b) OF THE HUMANE HANDLING CODE [redacted] TATED THAT HE WOULD GET THIS PROBLEM CORRECTED. THIS SERVED AS A

(b)(6), (b)(7)(c)

(b)(6)

20981 M NR Summary
For Period: 01/01/2005 to 11/09/2006

Date	Procedure	Result	NR#	Insp.	Shift	Appeal (Yes)	Open (Yes)	Reported To
7/13/2006	*04C02*	*I*	*0009-2006-7280 (continued)*					

WRITTEN NOTICE ON INHUMANE HANDLING.

US Department of Agriculture
FOOD SAFETY AND INSPECTION SERVICE
NONCOMPLIANCE RECORD

TYPE OF NONCOMPLIANCE
☐ Food Safety ☒ Other Consumer Protection

1. DATE	2. RECORD NO.	3. ESTABLISHMENT NO.
06/20/2005	0002-2005-7248	20321 M / 1

4. TO (Name and Title)	5. PERSONNEL NOTIFIED
Arnold Luce/Owner, President/GM	Arnold Luce/Owner

6. RELEVANT REGULATION(S)
313.2(e), 3132(a)

7. SECTION/PAGE OF EST. PROCEDURE PLAN	HACCP	SSOP	OTHER
			n/a

8. ISP CODE	9. NONCOMPLIANCE CLASSIFICATION INDICATORS
04C02	PRODUCT - Protocol

10. DESCRIPTION OF NONCOMPLIANCE (b)(6)

While walking through the pens at 7:20am. I observed Pen #2 was without water, there was 1 pig in the pen and the water bucket was knocked over. Mr.Luce was notified and water restored to the pen. 7:50am while walking through the pens, pen #5 with 2 pigs in the pen knocked over their water bucket. Mr. Luce was notified and water restored. 10:20am pen # 2 with 1 pig and pen #3 holding 2 beef cows the water was knocked over. [redacted] were notified. Water was restored once again. Water is being kept in 5 gallon buckets/pails and small 2-3 gallon tubs. The animals have a tendency to knock the buckets over therefore leaving them without water.
At 1305 hrs while 6 small swine being lead to the holding pens. I observed plant personnel pulling 3 swine by the ears into the pens. The swine were dragged approximately 5-6 feet. 313.2(a) "States Driving livestock from the unloading ramps to the holding pens and from holding pens to the stunning area shall be done with a minimum of excitement and discomfort to the animals. Livestock shall not be forced to move faster than normal walking speed."

7/18 called [redacted]. They Should use some Method to fix the buckets

(b)(6), (b)(7)(c) [redacted]

11. SIGNATURE OF INS[redacted] (b)(6), (b)(7)(c)

You are hereby advised of y[redacted] of 9 CFR.

12. PLANT MANAGEMENT RESPONSE (Immediate action(s)):
Restored water in pens kept the Buckets Filled

Will Hold Training on Livestock moving

13. PLANT MANAGEMENT RESPONSE (further planned action(s)):
We Will Check Pen water Supply more Frequently

I Had meeting w/employees animals will Be Driven not Pulled.

This document serves as written notification that your failure to comply with regulatory requirement(s) could result in additional regulatory or administrative action.

14. SIGNATURE OF PLANT MANAGEMENT [signature] 15. DATE 6/24/05

16. VERIFICATION SIGNATURE OF INSPECTION PROGRAM EMPLOYEE 17. DATE

FSIS FORM 5400-4 (7/98)
Replaces FSIS Form 5400-4 (9/97), which may be used until exhausted (7/98)

DISTRIBUTION: Original & 1 Copy to Establishment, 1 Copy to Inspector
Page 1 of 1

000003

US Department of Agriculture
FOOD SAFETY AND INSPECTION SERVICE
NONCOMPLIANCE RECORD

TYPE OF NONCOMPLIANCE
☐ Food Safety ☒ Other Consumer Protection

1. DATE	2. RECORD NO.	3. ESTABLISHMENT NO.
06/27/2005	0003-2005-7248	20321 M / 1

4. TO (Name and Title)	5. PERSONNEL NOTIFIED
Arnold Luce/Owner, President/GM	Arnold Luce/Owner

6. RELEVANT REGULATION(S)
313.15, Slaughter Act 1978, Dir6900.2

7. SECTION/PAGE OF EST. PROCEDURE PLAN	HACCP	SSOP	OTHER
			N/A

8. ISP CODE	9. NONCOMPLIANCE CLASSIFICATION INDICATORS
04C02	PRODUCT - Protocol

10. DESCRIPTION OF NONCOMPLIANCE

At Approximately 10:50 AM While monitoring the establishments knocking procedures, I observed an employee with 2 pigs in the kill chute. One pig was being targeted for the kill, the first shot was missed, the second shot hit, the pig did not go down. A small amount of time lapsed at this point to re-load and try to restrain the animal in the chute for a third shot. A third shot was given to the pig then a fourth. At this point the animal went down and was rendered unconscious. This is unacceptable for the establishment did not limit the free movement of the animal sufficiently to allow the operator to locate the stunning blow with a high degree of accuracy. Mr. Luce was notified and assisted with the kill.

(b)(6), (b)(7)(c)

7/18 called [redacted] to see if the managment use ways to ristrict the movement of pigs. [redacted]

11. SIGNATURE OF INSPECTION PRO[redacted] (b)(6), (b)(7)(c)

You are hereby advised of your right to appeal th[redacted] of 9 CFR.

12. PLANT MANAGEMENT RESPONSE (Immediate action(s)):
Immediately after Relizing 2 Shots Had Been Fired and no pig was Down I went to Stunning area to make Sure Kill Could Be Completed Swiftly. USDA personel Had Halted Plant personell From Finishing Kill I took Charge and Finished Kill

13. PLANT MANAGEMENT RESPONSE (further planned action(s)):
Plant personell were Talked to and From NOW ON only one Pig will Be allowed in Kill Shute at a time IF possible. This Should allow For a Better Chance for Better Kills

This document serves as written notification that your failure to comply with regulatory requirement(s) could result in additional regulatory or administrative action.

14. SIGNATURE OF PLANT MANAGEMENT [redacted] 15. DATE 6/29/05

16. VERIFICATION SIGNATURE OF INSPECTION PROGRAM EMPLOYEE 17. DATE

FSIS FORM 5400-4 (7/98)
Replaces FSIS Form 5400-4 (9/97), which may be used until exhausted (7/98)

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000004

8/3/05

FROM: [redacted] (b)(6), (b)(7)(c)

SUBJ: NR 0002-2005-7248

I have been Monitoring the Establishment and the said Frequencies. They are monitoring the water at the Frequencies stated.

Cows are Always with water and when they have more than 2 cows in Pen. they make a point to have multiple water Buckets in Pen.
Any Questions Please Contact me.

Thank you.

[redacted]

b)(6), (b)(7)(c)

USDA, FSIS, FO
ALBANY, NY DISTRICT OFFICE
AUG -9 2005
RECEIVED

000005

US Department of Agriculture
FOOD SAFETY AND INSPECTION SERVICE
NONCOMPLIANCE RECORD

TYPE OF NONCOMPLIANCE: Food Safety [X] Other Consumer Protection

1. DATE	2. RECORD NO.	3. ESTABLISHMENT NO
07/29/2005	0003-2005-7319	04470 M / 1

4. FO (Name and Title): Tina Kamery, Haccp Manager

5. PERSONNEL NOTIFIED: Tina Kamery

6. RELEVANT REGULATION(S): 313,2 (a)&(e)

7. SECTION/PAGE OF EST. PROCEDURE PLAN	HACCP	SSOP	OTHER
			Humane Handling

8. ISP CODE	9. NONCOMPLIANCE CLASSIFICATION INDICATORS
04C02	PRODUCT - Protocol

10. DESCRIPTION OF NONCOMPLIANCE

Handling of Livestock, At 0945 hours while observing the handling of the swine I observed the pig being dragged from the trailer with rope around its neck forcibly causing the pig discomfort and excitement.(vocalizing and squealing)
I also observed that no water had been provided to the animals while in the trailer awaiting slaughter. The trailer was here since 7:00 AM.
the above noncompliance's are in violation of 9CFR 313.2 (a) & (e) 313.2 Handling of livestock.
(a) Driving of livestock from the unloading ramps to the holding pens and from the holding pens to the stunning area shall be done with a minimum of excitement and discomfort to the animals. Livestock shall not be forced to move faster than a normal walking speed.
(e) Animals shall have access to water in all holding pens and, if held longer than 24 hours, access to feed. There shall be sufficient room in the holding pen for animals held overnight to lie down.

USDA, FSIS, FO
ALBANY, NY DISTRICT OFFICE
AUG -8 2005
RECEIVED

(b)(6), (b)(7)(c)

11. SIGNATURE OF INSPECTION PROGRAM EMPLOYEE: [redacted]

You are hereby advised of your right to appeal this decision as delineated by 306.5 and or 381.35 of 9 CFR

12. PLANT MANAGEMENT RESPONSE (Immediate action(s)): Corrective action was taken immediately. Gates were put up and pig walked into stunning area not being led by rope or forceably driven.

13. PLANT MANAGEMENT RESPONSE (further planned action(s)): Pigs will be unloaded into pig pen with water and not held in trailer to minimize excitement and discomfort. Driving of Livestock to the holding pen and stunning Areas will be done to Not Cause Discomfort. And to meet Humane handling Regulations 313

This document serves as a written notification that your failure to comply with regulatory requirement(s) could result in additional regulatory or administrative action.

14. SIGNATURE OF PLANT MANAGEMENT: Tina M Kamery — 15. DATE: 8/1/05

16. VERIFICATION SIGNATURE OF INSPECTION PROGRAM EMPLOYEE: (b)(6), (b)(7)(c) [redacted] — 17. DATE: 8/1/05

FSIS Form 5400-4 (7/98)
Replaces FSIS Form 5400-4 (9/97), which may be used until exhausted (7/98)

DISTRIBUTION: Original & 1 Copy to Establishment, 1 Copy to Inspector

Date	Procedure	Result	NR#	Insp.	Shift	Appeal (Yes)	Open (Yes)	Reported To
5/6/2005	*04C02*	*I*	*0014-2005-6921*	[redacted]	*1*			*Danny Peed*

On May 6th at approx. 1120 while performing slaughter inspection duties on the kill floor the following noncompliance was noted; Robersonville Packing uses the captive bolt method for stunning. [redacted] was present doing dispositions on two retained animals and a loud squeal was heard coming from the knock down box immediately after the captive bolt had been discharged. We investigated and found a porcine animal that had been stunned, but was still on its feet and was squealing. It was not unconscious as required by CFR 313.15(3). USDA rejection tag # B36015076 was immediately applied to knockdown box and official control action was taken. Mr. Danny Peed was notified of the establishments failure to comply with CFR 313.15(3). Mr. Danny Peed discussed with [redacted] and his " verbal response" to the NR to be generated was that he would let a more experienced employee knock down the last six porcine. He also stated that the more experienced employee [redacted] would further train the new employee. The rejection tag was removed and [redacted] knocked down the final six hogs. [redacted] checked with me before he left to make sure things were being done as stated by Mr. Peed.

This document serves as written notification that your failure to comply with regulatory requirement(s) could result in additional regulatory or administrative action.

5/26/2005 *04C02* *I* *0019-2005-5731* [redacted] *1* *Danny Peed*

When performing Ante Mortem inspections at 6:50 AM at Robersonville Packing Co., the following non compliance was observed. Pen #4 with 39 hogs, had no feed available for these animals that were present and had received Ante Mortem inspection on 5-25-05 with 111 animals in the pen. [redacted] slaughter supervisor was informed of the animals being without feed. Around 1:20 PM inspector [redacted] and I returned to the holding pens and saw 5 beef carcasses in pen #1 without water. Mr. Peed, plant owner, was in the barn washing the pens and I verbally informed him of the animals being without feed and water. This NR serves as written notification of plants failure e to comply with regulatory requirements of 313.2(e), which states" Animals shall have access to water in all holding pens and, if held longer than 24 hours , access to feed. There shall be sufficient room in the holding pen for animals held overnight to lie down .

6/7/2005 *04C02* *I* *0020-2005-5515* [redacted] *1* *Danny Peed*

While performing antemortem (Category IV) at 7 am at Robersonville Packing , the following noncompliance was observed. There was a hole in the floor of the scale pen holding 24 hogs. One of the hogs foot got stuck in the hole. [redacted] he QA manager, was notified and a U.S. Rejection Tag #B36 449946 was applied to the pen.

6/14/2005 *04C02* *I* *0024-2005-5515* [redacted] *1* *Danny Peed*

At approx. 7:10 AM, while conducting antemortem inspection, myself, [redacted]) were present. We observed a pig that was unable to get up. The pig was in the pen that the establishment wanted antemortem inspection conducted. [redacted] he plant employee moving the animals, walked towards the back of the pen, this resulted in several pigs stepping on the downer animal. We told [redacted] that he needed to take appropriate action with the downer animal. He attempted to get the downer up, but the animal was unable to rise. He then pushed the animal away from the pen entrance. When we informed him that he was not allowed to push the animal, he left it where it was and began moving the rest of the pigs in the pen. The result was that several of the pigs stepped on the downer animal. At that time, we informed him that he must stop and take the appropriate action on the downer animal. He told us that he would kill the animal after [redacted] inspected it. While waiting for this inspection, we observed more animals walking on the downer animal.

In addition, when [redacted] was moving the animals in the pen, he was prodding them excessively. The animals were attempting to move away from him, but there were too many animals in the pen. The pigs were excessively excited which resulted in animals climbing over one another. He was moving the animals in order for us to conduct an antemortem inspection. We could not properly conduct the antemortem inspection because there were too many animals in the pen for us to be able to see each individual animal as he was moving them.

Also, we observed several (MT 8) animals in the US Suspect Pen. Some of the animals were laying down, while others were walking on them. There was not enough room in the pen for the amount of animals present.

At approximately 7:30 AM, Regulatory Control Action was taken with the application of USDA Reject tag B28672386

(b)(6) (b)(6), (b)(7)(c)

Date	Procedure	Result	NR#	Insp.	Shift	Appeal (Yes)	Open (Yes)	Reported To
6/14/2005	*04C02*	*I*	*0024-2005-5515 (continued)*					

on the knocking box. Danny Peed, General Manager, was informed of the failure to comply with CFR 313.2(a), 313.2(d)(1), 313.2(d)(2), 313.2(b).

8/5/2005 *04C02* *I* *0040-2005-6926* [redacted] *1* *Danny Peed*

On Friday, August 5, 2005, at 10 a.m. at Robersonville Packing while performing an 08S03 outside security procedure, Inspector [redacted] observed approximately 20 hogs in the designated cow pen without water. There was empty containers in the pen, one was turned over but the floor was not wet to indicate any presence of water. Official Regulatory control was taken by applying rejected tag #B36015082. to the knocking area. Mr. Peed, plant owner, was notified of the plants failure to comply with CFR 313.2 (e), 500.3 (b).

5/4/2006 *04C02* *I* *0020-2006-5412* [redacted] *Danny Peed*

While inspecting the hog pens, at approximately 1:30 p.m., [redacted], supervisor, found a pen of hogs on the scale area that did not have any water. Regulatory control action was taken by applying U.S. Rejected tag B28672387 to the knock box. [redacted] was notified of the plants failure to comply with CFR 313.2(e) and 500.3(b).

5/18/2006 *04C02* *I* *0022-2006-5412* [redacted] *Danny Peed*

While in the hog pens at approximately 11 a.m. I saw a open hole in the back of pen #2 large enough for hogs to stick their heads through. I also saw several nails, approximately five, that were sticking out of wood boards in the pen. Regulatory control action was taken by applying U.S. Rejection Tag #B28672392 on the pen. [redacted] was notified of the plant's failure to comply with CFR 313.1 (a), 500.2(a)(4).

8/7/2006 *04C02* *I* *0031-2006-5515* [redacted] *1* *Danny Peed*

At approx 1:45 PM, while performing an 04C02 procedure, [redacted] RVMO was observing the off-loading of pigs. When the trailer arrived, he saw an employee spraying water onto the hogs before off-loading. However, the water hose was not long enough for the water to reach the very front of the trailer. [redacted] said something to the employee about this. The pigs were then being off-loaded from the trailer. As the first pig came out of the trailer, it's legs got stuck between the end of the trailer and the ramp [redacted] truck driver, placed a piece of wood between the truck and the ramp. Another pig was off-loaded, and its legs also got stuck. I also observed pigs leaving the trailer and getting their feet stuck. I then took regulatory control action of the loading ramp with USDA Reject Tag # B28672278.
While the plant was correcting the above situation, we observed that the pigs on the front of the trailer were still very overheated and had not received any water. This was at least 30 minutes after the trailer had arrived. This noncompliance was previously noted on 06/28/06 (NR 0026-2006-6921) The plant's preventive measures were that the pigs would be wet down real good before unloading [redacted] was also shown proper unloading procedures. These preventive measures were either not implemented or not effective. This document serves as written notification that your failure to comply with regulatory requirement(s) could result in additional regulatory or administrative action.
Danny Peed, President and [redacted] Supervisor, were notified of these failures to comply with 9 CFR 313.1(b) and 313.2(a).

8/17/2006 *04C02* *I* *0033-2006-5515* [redacted] *1* *Danny Peed*

At approx. 2:00 PM, while conducting an 04C02 procedure in the livestock pens, the following noncompliance was noted. The pens are partially constructed of fence wire. In several locations, this wire is protruding, where animals can be injured. There are also nails sticking out in at least two locations in the main alleyway. [redacted] Supervisor, was notified of this failure to comply with 9 CFR 313.1.

(b)(6), (b)(7)(c) (b)(6)

22064 M NR Summary
For Period: 01/01/2005 to 11/09/2006

Date	Procedure	Result	NR#	Insp	Shift	Appeal (Yes)	Open (Yes)	Reported To
9/13/2006	*04C02*	*I*	*0043-2006-5515*	[redacted]	*1*			*Danny Peed*

At approx. 2:00 PM, while observing the stunning of pigs, [redacted], observed the following noncompliance. The sunning employee was applying the captive bolt stunning device. At the last second, the pig moved its head, resulting in a "missed" stun. This resulted in injury, but not unconsciousness. The plant employee casually reloaded the device; and due to improper procedures being used in the reloading , the hog was not able to be immediately restunned. (The stunning rod did not properly discharge on two occasions.) Once the animal was properly stunned [redacted] stopped any further stunning. There was a meeting held with [redacted] Kill Floor Supervisor; [redacted] and [redacted] Supervisor. At that time, the following preventive measure was presented by the plant personnel. In the occurrence of any "missed" stunning, plant will have an alternative method of stunning in place.

000009

[redacted] Supervisor, was notified of this failure to comply with 9 CFR 313.15.

9/20/2006 04C02 I 0049-2006-5515 [redacted] 1 Danny Peed

At approx. 2:30 PM, while observing inspection trainee conduct postmortem procedures on the kill floor, I heard a pig squeal in the stunning area. I immediately went to the area and observed a pig with a stun mark on the head and blood coming from its nose. The pig was walking around in the stunning area. A plant employee immediately grabbed the rifle to shoot the pig. The rifle failed to fire 3 times. The employee then grabbed the captive bolt stunner and was attempting to stun the pig again. But the pig climbed over the gate onto the kill floor area. Plant employees then cornered it in the inedible room and shot it with the rifle, killing it. Regulatory Control Action was taken with USDA Tag #B28672302 being placed on the stunning box. [redacted]Kill Floor Supervisor and [redacted] Plant Supervisor were notified of this failure to comply with 9 CFR 313.15.

This noncompliance was previously noted on 09-13-06 (NR 0043-2006-5515). The previous preventive measure was that in the occurrence of any "missed" stunning, plant will have an alternative method of stunning in place. This previous preventive measure was not effective. This document serves as written notification that your failure to comply with

(b)(6)

(b)(6), (b)(7)(c)

Date	Procedure	Result	NR#	Insp.	Shift	Appeal (Yes)	Open (Yes)	Reported To
9/20/2006	*04C02*	*I*	*0049-2006-5515 (continued)*					

regulatory requirement(s) could result in additional regulatory or administrative action. This trend will be discussed with plant management when they are given this document.

9/27/2006	*04C02*	*I*	*0056-2006-5515*	[redacted]	*I*	*Yes*	*Danny Peed*

Beginning at approx. 7:15 AM, while conducting an 04C02 procedure and antemortem inspection, the following noncompliances were noted by myself; [redacted] and [redacted] Area VI Supervisor.

1. In several of the pens, there are broken boards and wires. In the off-loading area, there were several (more than 3) nails with the sharp end protruding where animals can be injured. Regulatory Control Action was taken on this with USDA reject tag#B28672297 at 8:25 AM.

The old scale area is now being used as a holding pen. We observed 4 holes in the floor of this pen. The holes were large enough for pigs to have their legs caught in them. Also, this pen has a wooden floor. The pigs had been urinating on the floor, making the floor wet and slippery. This resulted in the pigs slipping and falling. At approx. 8:20 AM, Regulatory Control Action was taken on this pen with USDA reject tag#B28672299. (We informed [redacted] at he needed to remove the pigs from the pen at this time).
This noncompliance (pen maintenance) was previously noted on 08/17/06 (NR#0033-2006-5515). The preventive measure was for the plant to continue to do maintenance on the pens. Also to correct all problems they see and document them on the maintenance logs. This preventive measure was either not implemented or was not effective. (When I checked the Pen Maintenance Log for the month of September, I noted that there were no findings for the weeks ending 09-01 and 09-08. There were no inspections documented for the weeks ending 09-15 and 09-22.) This document serves as written notification that your failure to comply with regulatory requirement(s) could result in additional regulatory or administrative action.

2. A pig (approx. 70 lbs) was stuck under the pen rail. When an employee attempted to get the pig up, it had to struggle to get out. During this attempt to free itself, it was emitting multiple vocalizations, indicating the level of pain that it was in. When I discussed this problem with Danny Peed, President, he immediately added another board to the bottom of the rail.

3. I observed 4 pigs being held in the stunning alleyway with no access to water for 40 minutes. Also, there was a small pig (approx. 70 lbs) held in the main alleyway for 40 minutes. The only water in that area was in a container too high for the pig to have access to it. When informed of this, Danny Peed immediately moved the animals to a pen with access to water.

4. There were 10 pigs held in the Suspect animal area. This area is divided by a gate that opens in one direction. There is access to water on only one side of the gate. When observed, the gate was closed. This resulted in the pigs on the other side of the gate having no access to water (4 of the 10 pigs). When informed of this, Danny Peed immediately tied the gate open to provide access to water to all of the pigs.

5. At approx. 2:20 PM [redacted] bserved the following. Plant personnel were moving animals from the unloading area down the ramp. At least 2 pigs slipped while moving around the unloading area and at least 2 pigs slipped while moving down the ramp. One of the pigs slipped and fell at the bottom of the ramp.

Danny Peed, President was notified of these failures to comply with 9 CFR 313.1(a), (b) & (e).

9/28/2006	*04C02*	*I*	*0058-2006-5515*	[redacted]	*I*	*Danny Peed*

At approx. 2:55 PM, while completing postmortem inspection and veterinary disposition, [redacted]

(b)(6), (b)(7)(c)

Date	Procedure	Result	NR#	Insp.	Shift	Appeal (Yes)	Open (Yes)	Reported To
9/28/2006	*04C02*	*I*	*0058-2006-5515 (continued)*					

and [redacted], Inspector, heard a pig squeal after being shot. They went into the stunning area and observed the stunning person shoot the same pig 3 more times before the animal was rendered unconscious. At that time, I placed USDA Reject Tag #B28672292 on the stunning gate and informed Danny Peed, President that I took a withholding action on the Slaughter Process in accordance with 9 CFR 500.3. During postmortem inspection of the carcass of the above mentioned animal, we noted 3 bullet exit wounds in the right jowl of the pig. Danny Peed, Plant President, was notified of this failure to comply with 9 CFR 313.16. At 4:00 PM, the withholding action was removed, after acceptable corrective actions had been provided.

10/31/2006 04C02 I 0069-2006-8136 [redacted] *1 Yes Danny Peed*

At approx.12:05p.m., RVMO [redacted], and [redacted] were observing a trailer with three cattle getting ready to be off loaded. A pig in the hog pen squealed ,and [redacted] and [redacted] started walking toward the pens . At that time [redacted] and [redacted] saw an employee that appeared to be forcing a pig to move faster than a normal walking speed. At that time the pig was getting excited , [redacted] explained to the employee that ,"that would not be tolerated."

[redacted] Kill Floor Supervisor , was also standing in the pen area. This is a violation of 9CFR 313.2(a). I then took regulatory control action of the holding pens with USDA Reject Tag #B27366599. [redacted] was notified of the establishments failure to comply with said regulation.

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US Department of Agriculture
FOOD SAFETY AND INSPECTION SERVICE
NONCOMPLIANCE RECORD

TYPE OF NONCOMPLIANCE
☐ Food Safety ☒ Other Consumer Protection

1. DATE	2. RECORD NO.	3. ESTABLISHMENT NO.
06/10/2005	0006-2005-7408	05297 M / 1

4. TO (Name and Title)
Joseph C. Latella Jr., Manager

5. PERSONNEL NOTIFIED (b)(6) [redacted]

6. RELEVANT REGULATION(S)
313.2(a)

7. SECTION/PAGE OF EST. PROCEDURE PLAN	HACCP	SSOP	OTHER
			other

8. ISP CODE	9. NONCOMPLIANCE CLASSIFICATION INDICATORS
04C02	PRODUCT - Protocol

10. DESCRIPTION OF NONCOMPLIANCE

Upon observing hogs during anti-mortem inspection ay 0745 hours. I observed an employee kicking one hog that wouldn't go thru the loading shoot. The employee then gave this hog an extremely hard kick to the abdomen causing the hog to scream. [redacted] was notified of this occurance.

(b)(6)

(b)(6), (b)(7)(c)

11. SIGNATURE OF INSPECTION PROGRAM EMPLOYEE [redacted]

You are hereby advised of your right to appeal this decision as delineated by 306.5 and/or 381.35 of 9 CFR.

12. PLANT MANAGEMENT RESPONSE (Immediate action(s)):
Employee was immediately pulled aside & reprimanded. Also all other employees were pulled in for a meeting on how to treat & act humanely towards animals.

13. PLANT MANAGEMENT RESPONSE (further planned action(s)):
Constant monitoring & meetings, & further training for employees on treating animals humanely. NOTE: # Livestock Barns are not part of listed as anti-mortem inspection pen.

(b)(6), (b)(7)(c)

This document serves as written notification that your failure to comply with regulatory requirement(s) could result in additional regulatory or administrative action.

14. SIGNATURE OF PLANT MANAGEMENT [redacted]

15. DATE 06-17-05

16. VERIFICATION SIGNATURE OF INSPECTION PROGRAM EMPL[redacted]

U.S. DEPARTMENT OF AGRICULTURE
FOOD SAFETY AND INSPECTION SERVICE

NONCOMPLIANCE RECORD

TYPE OF NONCOMPLIANCE: ☐ Food Safety ☒ Other Consumer Protect

1. DATE	2. RECORD NO.	3. ESTABLISHMENT NO.
12/11/2003	8-2003-4573	09846A M / 1

4. TO (*Name and Title*): Mr. Calvin Hampton, Plant Manager

5. PERSONNEL NOTIFIED: Mr. Calvin Hampton

6. RELEVANT REGULATION(S): 500.2(a)(4)

7. RELEVANT SECTION/PAGE OF ESTABLISHMENT PROCEDURE/PLAN	HACCP	SSOP	OTHER
			X

8. ISP CODE: 04C02

9. NONCOMPLIANCE CLASSIFICATION INDICATORS

PLANT PROCESS	A. ☐ SSOP	☐ Monitoring	☐ Corrective Action	☐ Recordkeeping	☐ Implementation
	B. ☐ HACCP	☐ Monitoring	☐ Corrective Action	☐ Recordkeeping	☐ Plant Verification
C.	☒ PRODUCT	☐ Economic	☐ Misbranding	☒ Protocol	
D.	☐ FACILITY	☐ Lighting	☐ Structural	☐ Outside Premises	☐ Product Based
E.	☐ E. COLI	☐ Other			

10. DESCRIPTION OF NONCOMPLIANCE:

At Approximately 1520 hrs. On December 11 2003 I Was observing [redacted] bringing the piglets in to the knocking pen . The pen was full so he picked up some pigs and through them on top of each other. I immediately told [redacted] that the pen was to full ,so he told [redacted] that was enough.
This is in direct violation of Humane Slaughter Directive 6900.2. This document serves as written notification that you failure to comply with regulation requirements could result in additional regulatory or administrative action. (b)(6)

11. SIGNATURE OF INSPECTION PROGRAM [redacted] (b)(6), (b)(7)(c)

You are hereby advised of your right to appeal this decision as delineated by 306.5 and/or 381.35 of 9 CFR.

12. PLANT MANAGEMENT RESPONSE (*Immediate action(s)*):
[redacted] was Removed from Job Immediately
[redacted] instruct The Kill

13. PLANT MANAGEMENT RESPONSE (*further planned actions(s)*):
we Explained To all Employees how Important It is To Treat The animals In a Humanely way

This document serves as written notification that your failure to comply with regulatory requirement(s) could result in additional regulatory or administrative action.

14. SIGNATURE OF PLANT MANAGEMENT	15. DATE
Carl Hampton	12-15-03
16. VERIFICATION SIGNATURE OF INSPECTION PROGRAM EMPLOYEE: [redacted] (b)(6), (b)(7)(c)	17. DATE: 12/18/03

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US Department of Agriculture
FOOD SAFETY AND INSPECTION SERVICE
NONCOMPLIANCE RECORD

TYPE OF NONCOMPLIANCE: | | Food Safety |X| Other Consumer Protection

1. DATE	2. RECORD NO.	3. ESTABLISHMENT NO.
04/12/2006	0021-2006-6497	05439 M / 1

4. TO (Name and Title): Tim Nugent, President/GM

5. PERSONNEL NOTIFIED: Tim Nugent

6. RELEVANT REGULATION(S): 313.2

7. SECTION/PAGE OF EST. PROCEDURE PLAN | HACCP | SSOP | OTHER: N/A

8. ISP CODE: 04C02

9. NONCOMPLIANCE CLASSIFICATION INDICATORS: PRODUCT - Protocol

10. DESCRIPTION OF NONCOMPLIANCE

HAT Category II, Truck Unloading During Ante mortem Inspection
On 04/12/06 at approximately 0740 hours while performing an unscheduled 04C02 the following noncompliance was witnessed:
1. I observed through a small space dividing a split level door to the livestock unloading area of the establishment, a company employee, grab the front right leg of a small size pig approximately 25 pounds, and with two hands lifted the pig and threw the pig from the interior of the truck to the bottom of the unloading area beyond the unloading ramp. Total area consisted of approximately 13 ft. in distance, but there was no evidence of injury to such pig.
2. I immediately took a regulatory control action and rejected the unloading area with U.S. Rejected Tag NO. B 22289643. I then verbally notified Plant Management Mr. Tim Nugent of this failure to meet the standard of humane treatment of livestock. This does not meet the regulatory requirements of 9 CFR 313.2.

3. This document serves as written notification that your failure to comply with the regulatory requirement(s) could result in additional regulatory or administrative action.

11. SIGNATURE OF INSPECTION PROGRAM EMPLOYEE: [redacted] (b)(6), (b)(7)(c)

You are here[illegible] of your right to appeal this action under 9 CFR 381.35 of 9 CFR.

12. PLANT MANAGEMENT RESPONSE (Immediate action(s)).
Employee of Truck Driver were notified that this behavior is not acceptable & will not be tolerated if small pigs disabled, they are to be removed off truck. Employee suspended for the day (4/12/06). We received humane handling regulations & Procedures. Employee is sorry for his actions and agree his assessment it will not happen again.

13. PLANT MANAGEMENT RESPONSE (further planned action(s)):
All Employee were retrained today at a meeting held out the plant (see attached) A copy of humane handling policy reviewed

This document serves as written notification that your failure to comply with regulatory requirement(s) could result in additional regulatory or administrative action.

14. SIGNATURE OF PLANT MANAGEMENT: Timothy B. Nugent 15. DATE: 4-12-06

16. VERIFICATION SIGNATURE OF INSPECTION PROGRAM EMPLOYEE: [redacted] 17. DATE: (b)(6), (b)(7)(c) 4-13-06

Replaces FSIS Form 5400-4 (9/97), which may not be used[illegible]

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U.S. GOVERNMENT INSPECTED PLANT

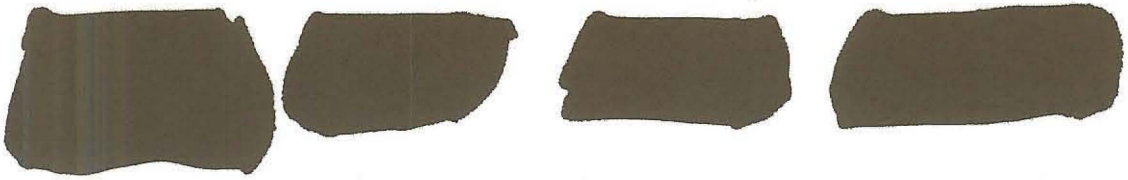
GREEN VILLAGE PACKING CO.

BRITTEN ROAD
GREEN VILLAGE, N.J. 07935
TEL. 973/377-0875 973/377-0915 FAX 973/377-5774

4/12/06

To: HC Est. #5439
From: Tim Nugent GVP
Subject: Humane Handling

This letter is to inform you that an official meeting regarding humane handling was held today @ Green Village Packing Co., for all kill floor employees. This meeting was in response to the incident which occurred today, while animals were being unloaded at the plant. The following plant employees were present @ the meeting:



(b)(6)

The main topic of discussion was livestock handling. We discussed ways we can implement procedures that minimize excitement, discomfort, and accidental injury to the animals. This includes unloading livestock trailers, moving animals within the pens, and moving them into stunning position. We talked about the use of electric prod, and how it should only be used in extreme circumstances. We also discussed different ways of handling injured or disabled livestock, so as not to cause further injury or discomfort to the animal. We also walked through the pens to look for loose boards and any sharp edges that may cause injury. Employees were told to check the pens everyday for these types of hazards, and fix or report them to management. We have made it everyone's responsibility to be sure that all pens have accessible fresh water. We discussed proper procedures for handling any livestock left overnight. These animals must have sufficient food, water, and space to move around or lay down.

All employees will be given a copy of FSIS notice 04-013N for a guide, and they all understand these procedures. They have all agreed to abide by these rules and regulations. They will all make a conscious effort to ensure the safety and comfort of the animals as they are unloaded, held, moved, and housed in our plant. In addition, all new employees shall receive humane handling rules and policy as part of the orientation to Green Village Packing Co. During available down times, establishment employees will review humane handling policy, and make update as needed.

U.S. DEPARTMENT OF AGRICULTURE
FOOD SAFETY AND INSPECTION SERVICE

NONCOMPLIANCE RECORD

TYPE OF NONCOMPLIANCE: [ ] Food Safety [X] Other Consumer Protecti

1. DATE	2. RECORD NO.	3. ESTABLISHMENT NO.
5/22/2003	12-2003-4894	20760 M / 1

4 TO (*Name and Title*): Wayne H. Kreisl Sr., President/GM

5 PERSONNEL NOTIFIED: Wayne H. Kreisl Sr.

6. RELEVANT REGULATION(S): 313.2(b)

7. RELEVANT SECTION/PAGE OF ESTABLISHMENT PROCEDURE/PLAN	HACCP	SSOP	OTHER
			n/a

8 ISP CODE: 04C02

9 NONCOMPLIANCE CLASSIFICATION INDICATORS

PLANT PROCESS	A. [ ] SSOP	[ ] Monitoring	[ ] Corrective Action	[ ] Recordkeeping	[ ] Implementation
	B. [ ] HACCP	[ ] Monitoring	[ ] Corrective Action	[ ] Recordkeeping	[ ] Plant Verification
C.	[X] PRODUCT	[ ] Economic	[ ] Misbranding	[X] Protocol	
D	[ ] FACILITY	[ ] Lighting	[ ] Structural	[ ] Outside Premises	[ ] Product Based
E.	[ ] E. COLI	[ ] Other			

10. DESCRIPTION OF NONCOMPLIANCE:

I was performing ante-mortem inspection from 07:30 - 07:45. During that time I observed an employee excessively whipping the hogs. He was whipping them on the back repeatedly and whipping them in the face also. I also observed him grabbing a live hog by the ear and dragging it across the floor. Regulation 313.2(b) states "ō 313.2 Handling of livestock.

(b) Electric prods, canvas slappers, or other implements employed to drive animals shall be used as little as possible in order to minimize excitement and injury. Any use of such implements which, in the opinion of the

11 SIGNATURE OF INSPECTION PRO[redacted]

You are hereby advi[redacted] 9 CFR.

12. PLANT MANAGEMENT RESPONSE *(Immediate action(s))*

(b)(6), (b)(7)(c)

See attached

13 PLANT MANAGEMENT RESPONSE *(further planned actions(s))*:

See attached

This document serves as written notification that your failure to comply with regulatory requirement(s) could result in additional regulatory or administrative action.

14. SIGNATURE OF PLANT MANAGEMENT: Dolly Bradow VSP

15. DATE: 5-29-03

16. VERIFICATION SIGN[redacted] (b)(6), (b)(7)(c)

17. DATE: 5/29/03

FSIS [redacted] exhausted.(7/98)

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U.S. DEPARTMENT OF AGRICULTURE
FOOD SAFETY AND INSPECTION SERVICE

NONCOMPLIANCE RECORD CONTINUATION SHEET

TYPE OF NONCOMPLIANCE
☐ Food Safety ☒ Other Consumer Protection

1. DATE	2. RECORD NO.	3. ESTABLISHMENT NO.
5/22/2003	12-2003-4894	20760 M / 1

4. TO (*Name and Title*)	5. PERSONNEL NOTIFIED
Wayne H. Kreisl Sr., President/GM	Wayne H. Kreisl Sr.

6. RELEVANT REGULATION(S)
313.2(b)

7 RELEVANT SECTION/PAGE OF ESTABLISHMENT PROCEDURE/PLAN	HACCP	SSOP	OTHER
			n/a

8. ISP CODE	9. NONCOMPLIANCE INDICATOR
04C02	Product Protocol

10. DESCRIPTION OF NONCOMPLIANCE:

inspector, is excessive, is prohibited.
Electrical prods attached to AC house current shall be reduced by a transformer to the lowest effective voltage not to exceed 50 volts AC."

USA PORK PACKERS, INC.
328 SOUTH WYOMING STREET
HAZLETON, PA. 18201
570-501-7675

May 28, 2003

USDA [redacted] (b)(6), (b)(7)(c)

Re; Response to NR # 12-2003-2894

Immediate Actions:

Employee was removed from unloading area for the remainder of the day. Hog in the dragging incident was stunned with cap and bolt.

Future Actions:

The employees in the unloading area were retrained and the whips were removed from this area. USA ordered paddles in place of the whips and the expected arrival date is June 6, 2003.

U.S. DEPARTMENT OF AGRICULTURE
FOOD SAFETY AND INSPECTION SERVICE

NONCOMPLIANCE RECORD

TYPE OF NONCOMPLIANCE: ☐ Food Safety ☒ Other Consumer Protecti

1. DATE	2. RECORD NO.	3. ESTABLISHMENT NO.
11/26/2004	56-2004-6454	20760 M / 1

4. TO (*Name and Title*): Wayne H. Kreisl Sr., President/GM (b)(6)

5. PERSONNEL NOTIFIED: [redacted]

6. RELEVANT REGULATION(S): 313.2 and 313.50

7. RELEVANT SECTION/PAGE OF ESTABLISHMENT PROCEDURE/PLAN	HACCP	SSOP	OTHER
			page 6

8. ISP CODE: 04C02

9. NONCOMPLIANCE CLASSIFICATION INDICATORS

PLANT PROCESS	A. ☐ SSOP	☐ Monitoring	☐ Corrective Action	☐ Recordkeeping	☐ Implementation	
	B. ☐ HACCP	☐ Monitoring	☐ Corrective Action	☐ Recordkeeping	☐ Plant Verification	
C.	☒ PRODUCT	☐ Economic	☐ Misbranding	☒ Protocol		
D.	☐ FACILITY	☐ Lighting	☐ Structural	☐ Outside Premises	☐ Product Based	
E.	☐ E. COLI	☐ Other				

10. DESCRIPTION OF NONCOMPLIANCE: (b)(6)

While performing 04C02 task in the stick area I observed the following. Their was a line of approximately eight carcasses stunned and stuck waiting to enter the scald tank, the next carcass in line to enter the tank fell to the floor inside stick room, (from a jam in the line) the next pig to enter the scald tank fell to the floor then got up and walk around the stick room, this pig had no stick mark. If the line did not backup and cause this pig to fall the animal would have been scalded alive. I stoppedslaughtering operations and applied U S reject Tag B 30 887274 to the stick room. I requested to speak with plant supervisor [redacted] I explained to [redacted] what I saw and

11. SIGNATURE OF INSPECTION [redacted] (b)(6), (b)(7)(c)

You are hereby advised of your right to appeal this decision as delineated by 306.5 and/or 381.35 of 9 CFR.

12. PLANT MANAGEMENT RESPONSE *(Immediate actions(s))*:

See attached

13. PLANT MANAGEMENT RESPONSE *(further planned actions(s))*:

See attached

This document serves as written notification that your failure to comply with regulatory requirement(s) could result in additional regulatory or administrative action.

14. SIGNATURE OF PLANT MANAGEMENT	15. DATE
Wayne Kreisl Jr.	12/10/04
16. VERIFICATION SIGNATURE OF INSPECTION PROGRAM EMPLOYEE [redacted] (b)(6), (b)(7)(c)	17. DATE 12/23/04

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U.S. DEPARTMENT OF AGRICULTURE
FOOD SAFETY AND INSPECTION SERVICE

NONCOMPLIANCE RECORD CONTINUATION SHEET

TYPE OF NONCOMPLIANCE: ☐ Food Safety ☒ Other Consumer Protection

1. DATE	2. RECORD NO.	3. ESTABLISHMENT NO.
11/26/2004	56-2004-6454	20760 M / 1

4. TO (*Name and Title*): Wayne H. Kreisl Sr., President/GM

5. PERSONNEL NOTIFIED: [redacted] (b)(6)

6. RELEVANT REGULATION(S): 313.2 and 313.50

7. RELEVANT SECTION/PAGE OF ESTABLISHMENT PROCEDURE/PLAN	HACCP	SSOP	OTHER
			page 6

8. ISP CODE	9. NONCOMPLIANCE INDICATOR
04C02	Product Protocol

10. DESCRIPTION OF NONCOMPLIANCE: (b)(6)

ask him to find out the reason it happen and what he would do to prevent it from happening again. I conveyed to [redacted] the seriousness of scalding a live pig. In a meeting with Wayne Kreisl Sr., [redacted] and several employees in the stick area we discussed what had happen. Apparently the line to the scald tank ja mmed and the stick person turned his back to fix the jammed line while doing this several times he loss track of the animals being stunned and one animal was missed and not stuck. The preventive measure that I agreed upon is that when the sticker turns his back or leaves the stick area all stunning is to be stopped and any animals that are already stunned are to be shackled, hung and stuck. Stunning is to resume when the sticker returns his attention to sticking and tells the stunner to resume. I removed US RejectTag and let operations continue. Delay of operations approximately one hour and thirty minutes.

USA PORK PACKERS, INC.
328 SOUTH WYOMING STREET
HAZLETON, PA. 18201
570-501-7675

December 10, 2004

[redacted] (b)(6), (b)(7)(c)

Re: NR # 56-2004-6454

Immediate Action(s):

When sticker is in position for an emergency stop, all stunning will stop until the sticker resumes his position.

Further Planned Action:

A second stand will be installed over the entire stick area, this will enable the sticker to view the entire blood rail and physically exam the hogs hanging as well as view them. This work will be completed by January 31, 2005.

U.S. DEPARTMENT OF AGRICULTURE
FOOD SAFETY AND INSPECTION SERVICE

NONCOMPLIANCE RECORD

TYPE OF NONCOMPLIANCE: ☐ Food Safety ☒ Other Consumer Protecti

1. DATE	2. RECORD NO.	3. ESTABLISHMENT NO.
3/28/2003	26-2003-4208	00320M M / 1

4. TO (*Name and Title*): Jerry Haddix, Plant Manager

(b)(6)

5. PERSONNEL NOTIFIED: [redacted]

6. RELEVANT REGULATION(S): Reg. 313.5 (a) (1); 313.5 (b) (2,3)

7. RELEVANT SECTION/PAGE OF ESTABLISHMENT PROCEDURE/PLAN	HACCP	SSOP	OTHER
			Directive 5000.1

8. ISP CODE: 04C02

9. NONCOMPLIANCE CLASSIFICATION INDICATORS

PLANT PROCESS	A. ☐ SSOP	☐ Monitoring	☐ Corrective Action	☐ Recordkeeping	☐ Implementation	
	B. ☐ HACCP	☐ Monitoring	☐ Corrective Action	☐ Recordkeeping	☐ Plant Verification	
C.	☒ PRODUCT	☐ Economic	☐ Misbranding	☒ Protocol		
D.	☐ FACILITY	☐ Lighting	☐ Structural	☐ Outside Premises	☐ Product Based	
E.	☐ E. COLI	☐ Other				

10. DESCRIPTION OF NONCOMPLIANCE:

Approximately 14:20 on March 27, 2003, upon leaving the shackling table, an excessive number of animals were noted attempting to right themselves, increased vocalization and the majority showed the ocular reflex of a conscious animal. It was also noted at least one animal going into the scald tub displaying a paddling movement, an indication of inadequate stunning/sticking.

During the approximately 20 - 25 minutes of stunning difficulty, the operation was stopped twice for

11. SIGNATURE OF INSPECTION PROGRAM EMPLOYEE: [redacted] (b)(6), (b)(7)(c)

You are hereby advised of your right to appeal this decision as delineated by 306.5 and/or 381.35 of 9 CFR.

12. PLANT MANAGEMENT RESPONSE (*Immediate actions(s)*):

13. PLANT MANAGEMENT RESPONSE (*further planned actions(s)*):

This document serves as written notification that your failure to comply with regulatory requirement(s) could result in additional regulatory or administrative action.

14. SIGNATURE OF PLANT MANAGEMENT	15. DATE
16. VERIFICATION SIGNATURE OF INSPECTION PROGRAM EMPLOYEE	17. DATE

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U.S. DEPARTMENT OF AGRICULTURE
FOOD SAFETY AND INSPECTION SERVICE

NONCOMPLIANCE RECORD CONTINUATION SHEET

TYPE OF NONCOMPLIANCE: ☐ Food Safety ☒ Other Consumer Protection

1. DATE	2. RECORD NO.	3. ESTABLISHMENT NO.
3/28/2003	26-2003-4208	00320M M / 1

4. TO (*Name and Title*): Jerry Haddix, Plant Manager

5. PERSONNEL NOTIFIED: Clarence L.; Gene Cook

6. RELEVANT REGULATION(S): Reg. 313.5 (a) (1); 313.5 (b) (2,3)

7. RELEVANT SECTION/PAGE OF ESTABLISHMENT PROCEDURE/PLAN	HACCP	SSOP	OTHER
			Directive 5000.1

8. ISP CODE	9. NONCOMPLIANCE INDICATOR
04C02 (b)(4)	Product Protocol

10. DESCRIPTION OF NONCOMPLIANCE:

approximately 5 - 6 minutes each time. However, the operation was restarted without consideration of the [redacted] level in the pit [redacted]) for adequate stunning. Furthermore, even though an effort was put forth in repairing the [redacted] stunner, thus requiring the cessation of operations, that effort failed to encompass the condition of the animals discharged from the stunner as a result of the lower [redacted] level. Even the use of 2 employees sticking did not prove adequate for proper sticking and bleeding of the animals because of the insufficient stunning.

Each of the characteristics described above are indicative of an inhumane handling of the animals as described and discussed in Regulation 313.5.

No corrective action was taken to rectify the status of animals already out of the stunner, nor was any action taken to alleviate additional animals from being added to the problem.

The problem did correct itself only after the [redacted] fill lines returned the stunning pit to an adequate [redacted] level, requiring at least 10 - 15 minutes.

This is a protocol violation of the Humane Slaughter and Handling Act.

11. SIGNATURE OF INSPECTION PROGRAM EMPLOYEE [redacted] (b)(6), (b)(7)(c)

15. DATE

FSIS FORM 5400-4 (7/98) Replaces FSIS Form 5400-4 (9/97), which may be used until exhausted.(7/98) DISTRIBUTION: Original & 1 copy - Establishment 1 copy - Inspector

April 9, 2003

[redacted] (b)(6), (b)(7)(c)

Establishment 320M

Dear Dr. [redacted] (b)(6), (b)(7)(c)

Please accept this letter as our notice to appeal NR 26-2003-4208. (b)(4)

On March 27, 2003 a line for [redacted] into the stunner broke. This was noted by the alarm going off which indicates that [redacted] levels are decreasing. As this alarm went off, establishment employees took corrective actions, which include stopping the line and assessing animals coming out of the stunner. The line speed was reduced and animals which had been in the stunner were assessed upon exit. Maintenance was called immediately and worked to correct the problem. A number of managers were in the area directing these efforts.

There are a number of discrepancies or inaccurate statements in this NR, and we request their revision or removal. (b)(4)

1) Time, timeframes and [redacted] readings are estimates, but are cited throughout the NR as though they were documented and witnessed..
2) The statement, "the operation was restarted without consideration of the [redacted] level in the pit [redacted] is incorrect.
   -At no time did the establishment ever NOT consider the [redacted] level. This is a measurement which is continuously monitored. Proper stunning of hogs using [redacted] is dependent on both the level and the time exposed to the gas, and so it is not appropriate to assess stunning quality on [redacted] levels alone.
3) The statement, "use of 2 employees sticking did not prove adequate for proper sticking and bleeding..." is incorrect.
   -The establishment recognized that CO_2 levels had decreased and that there was movement of animals on line. An additional employee was added to ensure that all animals were properly stuck, and it was not necessary to use this person (it should be noted that movement on the bleed line is acceptable if there is not a righting action).

(b)(4)

4) The statement, "The problem did correct itself only after the [redacted] fill lines returned the stunning pit to an adequate [redacted] level…", is not accurate.
-The establishment is unaware of USDA defining adequate levels of [redacted]

Humane handling is a subject this establishment takes very seriously as evidenced by our training programs for both associate and mangers. Our procedures are documented and audited regularly and we have made handling part of our Process Verified Program.

We appreciate your consideration and respectfully request this NR be significantly altered or rescinded.

Sincerely,

Calvin R. Held
V.P. Processing Operations
Establishment 320M

[redacted] (b)(6)

United States Department of Agriculture
Food Safety and Inspection Service
James J. Sparks, Jr. DVM PSF
Est 320 M
PO Box 99 22123 Hwy 5
Milan, Mo. 63556

April 30, 2003

Calvin Held, VP operations
PSF
Milan, Mo. 63556

Mr. Held,

I am in receipt of the appeal request from your office concerning the NR 26-2003. I appreciate the opportunity to review and revisit the issue of concern.

The noncompliance record 26 – 2003 – 4208 was written based on the observation of an USDA inspector; i. e., excessive vocalization in the area of the shackle/bleed troughs and the noted paddling and righting attempts of an animal entering the scald tub on the date of record. This alone is sufficient to indicate inhumane handling according to Reg. 313.5.

My investigation of the events surrounding this issue, including a discussion with you, provided the information utilized in the NR. To the best of my knowledge, the information provided was from employees associated with the collateral damage created by the break in the [redacted] line. Several of these witnesses attested to the cessation of operations by [redacted] Dirty Kill Supervisor, but also to the restarting of the operation by [redacted], Kill Floor Superintendent. The status of the animals leaving the stunner, following the restarting of the operation by [redacted] was that of excessive vocalization and righting attempts as compared to normal operation levels. Other than when shut down, no reduction in line speed was noted by anyone. Furthermore, no effort was put forth to use the hand-held stunner to correct the status of the animals leaving the stunner prior to sticking.

While the USDA does not define adequate levels of [redacted] for the purpose of creating an unconscious state in livestock, it does demarcate the characteristics delineating inhumane handling. Rendering an animal unconscious is necessary prior to sticking. The percentages used in the discussion of the stunning pit were provided by you in our visiting of the issue and substantiated by the very people running the machine or maintaining it.

Based on my investigation of the events surrounding this issue, I wish to reiterate that the stunner breaking was not the problem; it was the corrective actions toward the collateral aspects of this problem.

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000027

USDA

United States Department of Agriculture

Food Safety and Inspection Service

James J. Sparks, Jr. DVM PSF
Est 320 M
PO Box 99 22123 Hwy 5
Milan, Mo. 63556

Because of the observations noted and the information provided and substantiated, I deny the appeal to alter or rescind this NR.

Should additional discussion be requested, please feel free to contact me or Dr. Dean Booth, c. s., at the Lawrence District Office.

Respectfully,

James Sparks DVM

Premium Standard Farms®

22123 Hwy. 5
P.O. Box 99
Milan, MO 63556

Phone: (660) 265-4061
Fax: (660) 265-3089

May 16, 2003

Dr. D.L. Booth, C.S.
Lawrence District Office
4920 W.15th St.
Lawrence, KS 66049-3855

Dear Dr. Booth,

This letter is to serve as our notice to appeal or request a revision of NR 26-2003-4208. (b)(4)

On March 27, 2003 a line for [redacted]) into the stunner broke. This was noted by the alarm going off which indicates that [redacted] levels are decreasing. As this alarm went off, establishment employees took corrective actions, which include stopping the line and assessing animals coming out of the stunner. The line speed was reduced and animals which had been in the stunner were assessed upon exit. Maintenance was called immediately and worked to correct the problem. A number of managers were in the area directing these efforts.

There are a number of discrepancies or inaccurate statements in this NR, and we request their revision or removal.

1) We understand that in all instructions to USDA personnel on humane handling, witnessing what was described should have resulted in an official control action. None was taken. In fact, the plant was not even notified of these observations until the next day (March 28, 2003). It would be beneficial to know of these occurrences immediately so they could be corrected.

2) The first paragraph references an assessment of ocular reflex and evidence of sensibility in the scald tank. None of our personnel in the area noted the occurrence of this, or of an FSIS person assessing this. In addition, ocular reflex and sensibility are highly subjective assessments that should only be performed by trained personnel. Furthermore, the establishment personnel present indicate that the event took place over a shorter period of time than indicated in the NR (10 minutes vs. 20-25).

3) Time, timeframes and [redacted] readings are estimates, but are cited throughout the NR as though they were documented and witnessed. In fact, no FSIS personnel were in the area at which the [redacted] levels may be read. Instead, it is our understanding that later that day, the operator was asked to share the level.

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(b)(4)

4) The statement, "the operation was restarted without consideration of the [redacted] level in the pit [redacted]" is incorrect.
-At no time did the establishment ever NOT consider the [redacted] level. This is a measurement which is continuously monitored. Proper stunning of hogs using [redacted] is dependent on both the level and the time exposed to the gas, and so it is not appropriate to assess stunning quality on [redacted] levels alone.
-In addition, the machine is designed to stop inputting [redacted] if it is shut down. This is to prevent spill over of [redacted] into work areas as there would be no uptake by the hogs. Therefore, it is not uncommon for a low reading to occur in conjunction with a stoppage which would then quickly increase upon restarting the equipment.
-Finally, some hogs were hand-stunned to ensure they did not return to sensibility.

5) The statement, "use of 2 employees sticking did not prove adequate for proper sticking and bleeding..." is incorrect.
-The establishment recognized that [redacted] levels had decreased and that there was movement of animals on line. An additional employee was added to ensure that all animals were properly stuck, and it was not necessary to use this person (it should be noted that movement on the bleed line is acceptable if there is not a righting action).

6) The statement, "The problem did correct itself only after the [redacted] fill lines returned the stunning pit to an adequate [redacted] level...", is not accurate.
-The establishment is unaware of USDA defining adequate levels of [redacted]

7) We have also included documents showing the QA assessment of insensibility and [redacted] levels.

Humane handling is a subject this establishment takes very seriously as evidenced by our procedures and training programs for both associate and mangers. All personnel that are handling animals or might be asked to do so are trained on our procedures which include information from [redacted] These procedures are documented and audited regularly and we have made handling part of our Process Verified Program.

The establishment acknowledges that there were operational challenges on that day, but feels that the NR should only address any alleged animal handling issues and not conjecture on how they occurred. In addition, any issues that are addressed should only be those which were seen first-hand by USDA and not "information provided by employees associated with the collateral damage...".

Actions that are in progress at this establishment are:
1) New definition of actions if [redacted] levels fall below the alarm level.

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2) Additional documentation in our guidelines/procedures of the above plus further clarification on identification of insensibility and actions to take should this occur.
3) We are scheduled for our annual update to all employees in this area and will further increase our emphasis on these issues.

We appreciate your consideration and respectfully request this NR be significantly altered or rescinded.

Sincerely,

Collette Schultz Kaster
V.P. Food Safety and Technical Services

Calvin Held
V.P. Processing Operations
Establishment 320M

[redacted] (b)(6)

United States Department of Agriculture

Food Safety And Inspection Service Field Operations

Lawrence District
4920 W. 15th St.
Lawrence, KS 66049

Mr. Calvin Held
V-P Operations
22123 Hway 5
Milan,Mo. 63556

05-30-2003

Dear Mr. Held:

Thank you for the opportunity to respond to your request for review/appeal of NR 26-2003-4208 that I received on 05-17-2003. After discussions with the assigned FSIS personnel, PSF management officials and Lawrence District managers, I would offer the following response.

On March 27 2003 an event occurred in the shackling/bleeding area of the PSF slaughter operations that indicated the animal/s may not have been properly stunned. Assigned FSIS inspection personnel witnessed this. This inspector was positioned toward the end of the bleed chain where the animals enter the scald tub. One animal was seen that displayed a paddling movement when entering the scald tank at the end of the bleed line. It was also reported that there were other animals noted trying to right themselves. The inspector was in the area between 3-5 minute timeframe.
Further FSIS personnel are charged with verifying the compliance of the Humane Slaughter and Handling Act on a daily basis. With the increased consumer awareness of these issues any challenges will require FSIS personnel to become more pro-active in their verification with locally assigned professional personnel becoming involved. Challenges such as this are taken very seriously and will be reviewed by the highest level of the district for resolution and action.
Therefore, in reviewing NR 26-2003-4208 I would agree that the NR should only focus on what was actually witnessed and not on second hand conjecture. Thus, the request to revise the information in section 10 of the NR will be sustained. I will instruct the FSIS IIC to revise the NR to read the following: "At approximately 14:20 on March 27, 2003 upon leaving the shackling table, a number of animals were noted attempting to right themselves. These animals were comatose prior to entering the scald tank. It was noted however, at least one animal going into the scald tub displaying a paddling movement. This is a violation of the Humane Slaughter and Handling Act".

The expectation would be, going forward, that PSF would react to alleviate any animals that are not properly stunned from getting through the shackling/bleeding area. As noted in your letter of appeal/revision of May 16, 2003 the newly implemented actions and protocol will help alleviate these issues going forward. USDA FSIS is charged with verifying the humane handling and slaughter act and will continue to be pro-active when operational challenges arise.

Once again, thank you for the opportunity to respond to your concerns. If you wish to further appeal this decision, please send your appeal to Dr. William Walker, Lawrence District Manager, 4920 West 15th Street, Lawrence, Ks. 66049.

Sincerely,

Dean L. Booth Jr. DVM
Chillicothe Circuit Supervisor

cc. USDA IIC
William Walker LDO ✓

564

Voice: 785 841-5600

Fax: 785 841-5623

U.S. DEPARTMENT OF AGRICULTURE
FOOD SAFETY AND INSPECTION SERVICE

NONCOMPLIANCE RECORD

TYPE OF NONCOMPLIANCE: ☐ Food Safety ☒ Other Consumer Protecti

1. DATE	2. RECORD NO.	3. ESTABLISHMENT NO.
11/12/2003	78-2003-4208	00320M M / 1

4. TO (*Name and Title*): Jerry Haddix, Plant Manager

5. PERSONNEL NOTIFIED: [redacted] (b)(6)

6. RELEVANT REGULATION(S): 313.2(d)(2)

7. RELEVANT SECTION/PAGE OF ESTABLISHMENT PROCEDURE/PLAN	HACCP	SSOP	OTHER

8. ISP CODE: 04C02

9. NONCOMPLIANCE CLASSIFICATION INDICATORS

PLANT PROCESS	A. ☐ SSOP	☐ Monitoring	☐ Corrective Action	☐ Recordkeeping	☐ Implementation	
	B. ☐ HACCP	☐ Monitoring	☐ Corrective Action	☐ Recordkeeping	☐ Plant Verification	
C.	☒ PRODUCT	☐ Economic	☐ Misbranding	☒ Protocol		
D.	☐ FACILITY	☐ Lighting	☐ Structural	☐ Outside Premises	☐ Product Based	
E.	☐ E. COLI	☐ Other				

10. DESCRIPTION OF NONCOMPLIANCE:

At approximately 7:40 a.m. on 11/12/03, I observed an establishment employee drag a disabled animal off a truck in the receiving area of the "new" barn. The employee emerged from the truck dragging the animal with a chain shackled around it's right rear leg. The chain was removed by the employee and the animal was laying on it's left side when it paddled it's legs and proceeded to try to right itself. The animal was laying approximately 6 feet inside the receiving door after the incident. The barn supervisor was immediately notified of the noncompliance. This incident is a violation of regulation 313.2(d)(2). Failure to comply with regulatory requirements may result in

11. SIGNATURE OF INSPECTION PROGRAM EMPLOYEE: [redacted] (b)(6), (b)(7)(c)

You are hereby notified of your right to appeal this decision as delineated by 306.5 and/or 381.35 of 9 CFR.

12. PLANT MANAGEMENT RESPONSE (*Immediate actions(s)*):

Please See Attached Company Response

13. PLANT MANAGEMENT RESPONSE (*further planned actions(s)*):

Please See Attached Company Response

This document serves as written notification that your failure to comply with regulatory requirement(s) could result in additional regulatory or administrative action.

14. SIGNATURE OF PLANT MANAGEMENT	15. DATE
Drew Tara	11-17-2003
16. [redacted] EMPLOYEE (b)(6), (b)(7)(c)	17. DATE 11/17/03

FSIS FORM 5400-4 (7/98) Replaces FSIS Form 5400-4 (9/97), which may be used until exhausted.(7/98) DISTRIBUTION: Original & 1 copy - Establishment 1 copy - Inspector

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U.S. DEPARTMENT OF AGRICULTURE
FOOD SAFETY AND INSPECTION SERVICE

NONCOMPLIANCE RECORD CONTINUATION SHEET

TYPE OF NONCOMPLIANCE
☐ Food Safety ☒ Other Consumer Protection

1. DATE	2. RECORD NO.	3. ESTABLISHMENT NO.
11/12/2003	78-2003-4208	00320M M / 1

4. TO (*Name and Title*)
Jerry Haddix, Plant Manager (b)(6)

5. PERSONNEL NOTIFIED
[redacted]

6. RELEVANT REGULATION(S)
313.2(d)(2)

7. RELEVANT SECTION/PAGE OF ESTABLISHMENT PROCEDURE/PLAN	HACCP	SSOP	OTHER

8. ISP CODE	9. NONCOMPLIANCE INDICATOR
04C02	Product Protocol

10. DESCRIPTION OF NONCOMPLIANCE:

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further regulatory actions.

Noncompliance Record Response Form
Est. 320M

Non compliance record #: 78-2003-4208

Date on NR: 11/12/2003

12. Plant Management Response: ***(Immediate action(s)):***
The associate performing this task was new to this area. This associate had just recently gone through the company training program and given a copy of the PSF Animal Handling Guidelines which do address the proper way to handle a downer animal. We immediately instructed this associate to discontinue handling downer hogs improperly. The affected hog was then properly transferred to the downer hog holding area for inspection and then was transferred to the stunning area.

13. Plant Management Response ***(further planned action(s)):***
The associate involved was disciplined regarding this issue at which time he was re-instructed on the proper downer hog handling methods. We also removed all shackle chains (intended for dead animals only) from the area to eliminate any chance of these being used again on downer hogs. We are also evaluating our training materials to insure that these types of items are emphasized and thoroughly covered in the training classes.

14. Signature of Plant Management Greg Tara **15. Date** 11-17-03.

U.S. DEPARTMENT OF AGRICULTURE
FOOD SAFETY AND INSPECTION SERVICE

NONCOMPLIANCE RECORD

TYPE OF NONCOMPLIANCE: ☐ Food Safety ☐ Other Consumer Protection

1. DATE	2. RECORD NO.	3. ESTABLISHMENT NO.
08/22/2001	00057-01	02316 M / 1

4. TO *(Name and Title)*
Ryland Meyr

5. PERSONNEL NOTIFIED
[redacted]

6. RELEVANT REGULATION(S)
FSIS Directive 6900.1 Revision 1

7. RELEVANT SECTION/PAGE OF ESTABLISHMENT PROCEDURE/PLAN →	HACCP	SSOP	OTHER X

8. ISP CODE

9. NONCOMPLIANCE CLASSIFICATION INDICATORS

PLANT PROCESS: A. ☐ SSOP	☐ Monitoring	☐ Corrective Action	☐ Recordkeeping	☐ Implementation	
B. ☐ HACCP	☐ Monitoring	☐ Corrective Action	☐ Recordkeeping	☐ Plant Verification	
C. ☐ PRODUCT	☐ Economic	☐ Misbranding	☐ Protocol		
D. ☐ FACILITY	☐ Lighting	☐ Structural	☐ Outside Premises	☐ Product Based	
E. ☐ E. COLI	☐ Other				

(b)(6)

10. DESCRIPTION OF NONCOMPLIANCE:

At approximately 1100 [redacted] requested that they be allowed to assist a nonambulatory and obviously hot pig into the inedible room. As I walked up to the trailer after it backed up to the downer pad I saw 2 Fruitland employees pulling on the pig, one of them had shackled the pig. I told them no shackle and help the pig. Instead the pig was drug and lifted into the inedible room while fully conscious.

11. SIGNATURE OF INSPECTOR [redacted] (b)(6), (b)(7)(c)

You are hereby advised of your right to appeal this decision as delineated by 306.5 and/or 381.35 of 9 CFR.

12. PLANT MANAGEMENT RESPONSE: *(Immediate action(s))*:
Miscommunication!

13. PLANT MANAGEMENT RESPONSE *(Further planned action(s))*:
Employees were told proper procedure for handling disabled animals.

This document serves as written notification that your failure to comply with regulatory requirement(s) could result in additional regulatory or administrative action.

14. SIGNATURE OF PLANT MANAGEMENT	15. DATE
Carol Kuhlman	8-23-01
16. VERIFICATION SIGNATURE OF INSPECTION PROGRAM EMPLOYEE [redacted] (b)(6), (b)(7)(c)	17. DATE 8/23/01

FSIS FORM 5400-4 (7/98) *Designed on FarmFlow software.* Replaces FSIS Form 5400-4 (9/97), which may be used until exhausted.

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1 copy - Inspector

The request for this information is Voluntary. It is needed to monitor defects found in this inspection system. It is used by FSIS to determine whether establishments are in compliance. 9CFR 301 and 9CFR 381. FORM APPROVED OMB NO. 0583-0089. OMB DISCLOSURE STATEMENT: Public reporting burden for this collection of information is estimated to average 7 minutes per response, including the time for reviewing instructions, searching existing data soures, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, inluding suggestions for reducing this burden, to Department of Agriculture, Clearance Officer, OIRM, Room 404-W, Washington, D.C. 20250; and to the Office of Information and Regulatory Affairs, Office of Management and Budget.

U.S. DEPARTMENT OF AGRICULTURE
FOOD SAFETY AND INSPECTION SERVICE

NONCOMPLIANCE RECORD

TYPE OF NONCOMPLIANCE: ☐ Food Safety ☒ Other Consumer Protecti

1. DATE	2. RECORD NO.	3. ESTABLISHMENT NO.
5/17/2004	11-2004-6232	19789 M / 1

4. TO (*Name and Title*): Travis W. Little, Earl Avery, Plant owner, Kill floor foreman

5. PERSONNEL NOTIFIED: Mike Little

6. RELEVANT REGULATION(S): 313.2 e and 313.2d 1

7. RELEVANT SECTION/PAGE OF ESTABLISHMENT PROCEDURE/PLAN	HACCP	SSOP	OTHER
			x

8. ISP CODE: 04C02

9. NONCOMPLIANCE CLASSIFICATION INDICATORS

PLANT PROCESS	A. ☐ SSOP	☐ Monitoring	☐ Corrective Action	☐ Recordkeeping	☐ Implementation	
	B. ☐ HACCP	☐ Monitoring	☐ Corrective Action	☐ Recordkeeping	☐ Plant Verification	
C.	☒ PRODUCT	☐ Economic	☐ Misbranding	☒ Protocol		
D.	☐ FACILITY	☐ Lighting	☐ Structural	☐ Outside Premises	☐ Product Based	
E.	☐ E. COLI	☐ Other				

(b)(6), (b)(7)(c)

10. DESCRIPTION OF NONCOMPLIANCE:

At approximately 1520 hr, an inspection of the hog holding pens was made for humane handing of animals by [redacted] and [redacted]. There were about 250 hogs delivered to the plant about 0800 hrs this morning. There are some dead animals (15 or more) in the pens with nearly all of the animals suffering the effects of heat exhaustion i.e. heavy respiration and depression. Some of the animals are standing, but many are down and unable to rise. The watering devise along the side of the pen does not appear to be working. There is no water available. Down and/or disabled animals have not been moved to a place of shelter. Regulation 313.2 e states that "animals

[redacted]

You are hereby advised of your right to appeal any decision as delineated by 306.5 and/or 381.35 of 9 CFR

12. PLANT MANAGEMENT RESPONSE *(Immediate action(s))*:

13. PLANT MANAGEMENT RESPONSE *(further planned actions(s))*:

This document serves as written notification that your failure to comply with regulatory requirement(s) could result in additional regulatory or administrative action.

14. SIGNATURE OF PLANT MANAGEMENT	15. DATE
16. VERIFICATION SIGNATURE OF INSPECTION PROGRAM EMPLOYEE	17. DATE

FSIS FORM 5400-4 (7/98) — Replaces FSIS Form 5400-4 (9/97), which may be used until exhausted.(7/98) — DISTRIBUTION: Original & 1 copy - Establishment 1 copy - Inspector

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NRII
Pg 1 of 3

As of 7.00 a.m. Monday, May 17, 04 the following has been completed or started.

1) ~~Sprinklers~~ have been added to holding pens on hill to water down hogs.
2) All water nozzles have been checked and are working properly.
3) All hogs shortly any sign of stress have been moved to covered pens in plant holding area.
4) Frame work for covering pens has been off loaded at holding pen area. Temporary shade will be in place by Monday May 24, 04 when new load of hogs arrive.
5) Permanent Shelter Structure will be worked on on Friday & Sat. while pens are empty.

I will have ~~two permanent shelter per week~~ ONE There are three pens, therefore all three pens will have permanent shelter ~~before June 7, 04~~

Temp. shelter will be provided on pens not ~~being~~ worked on.

2nd [redacted]

NR11
93 of 93

U.S. DEPARTMENT OF AGRICULTURE
FOOD SAFETY AND INSPECTION SERVICE

NONCOMPLIANCE RECORD

TYPE OF NONCOMPLIANCE: ☐ Food Safety ☒ Other Consumer Protecti

1. DATE	2. RECORD NO.	3. ESTABLISHMENT NO.
11/10/2004	57-2004-4617	07237 M / 1

4. TO (*Name and Title*): Joe Ondrusek, President/GM (b)(6)

5. PERSONNEL NOTIFIED: [redacted]

6. RELEVANT REGULATION(S): 313.2 (d-1,2,3);500.1(a);500.2(4-b)

7. RELEVANT SECTION/PAGE OF ESTABLISHMENT PROCEDURE/PLAN	HACCP	SSOP	OTHER
			Product Procotol

8. ISP CODE: 04C02

9. NONCOMPLIANCE CLASSIFICATION INDICATORS

PLANT PROCESS	A. ☐ SSOP	☐ Monitoring	☐ Corrective Action	☐ Recordkeeping	☐ Implementation	
	B. ☐ HACCP	☐ Monitoring	☐ Corrective Action	☐ Recordkeeping	☐ Plant Verification	
C.	☒ PRODUCT	☐ Economic	☐ Misbranding	☒ Protocol		
D.	☐ FACILITY	☐ Lighting	☐ Structural	☐ Outside Premises	☐ Product Based	
E.	☐ E. COLI	☐ Other				

10. DESCRIPTION OF NONCOMPLIANCE:

At 1139 hrs I observed the following non-compliance(s): Arriving in the stunning area to perform task 04C02, I observed two employees with two swine livestock animals both shackled by their hind legs being dragged into the stunning area. Closer inspection showed that these animals were conscious and whining. I immediately stopped all stunning activity and inform the stunner that no animals were to be stun until I told him it was ok. (The employee is Hispanic but another English speaking employee translated. I asked another employee to get a supervisor to this area. [redacted] arrived and was informed of activities going on in this area. He called [redacted] (Production Supervisor) (b)(6)

11. SIGNATURE OF INSPECTION PROGRAM EMPLOYEE: [redacted] (b)(6), (b)(7)(c)

You are hereby advised of your right to appeal this decision as delineated by 306.5 and/or 381.35 of 9 CFR.

12. PLANT MANAGEMENT RESPONSE (*Immediate actions(s)*):

13. PLANT MANAGEMENT RESPONSE (*further planned actions(s)*):

This document serves as written notification that your failure to comply with regulatory requirement(s) could result in additional regulatory or administrative action.

14. SIGNATURE OF PLANT MANAGEMENT	15. DATE
16. VERIFICATION SIGNATURE OF INSPECTION PROGRAM EMPLOYEE	17. DATE

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*This is a copy of original signed copy for D. Dilland @ 214.767.8230

U.S. DEPARTMENT OF AGRICULTURE
FOOD SAFETY AND INSPECTION SERVICE

NONCOMPLIANCE RECORD CONTINUATION SHEET

TYPE OF NONCOMPLIANCE: ☐ Food Safety ☒ Other Consumer Protection

1. DATE	2. RECORD NO.	3. ESTABLISHMENT NO.
11/10/2004	57-2004-4617	07237 M / 1

4. TO (*Name and Title*): Joe Ondrusek, President/GM (b)(6)

5. PERSONNEL NOTIFIED: [redacted]

6. RELEVANT REGULATION(S): 313.2 (d-1,2,3);500.1(a);500.2(4-b)

7. RELEVANT SECTION/PAGE OF ESTABLISHMENT PROCEDURE/PLAN	HACCP	SSOP	OTHER
			Product Procotol

8. ISP CODE: 04C02 (b)(6), (b)(7)(c)

9. NONCOMPLIANCE INDICATOR: Product Protocol (b)(6)

10. DESCRIPTION OF NONCOMPLIANCE:

two-way radio to area, at that time I informed [redacted] of my findings and that I would be calling [redacted] (District Veterinary MS) of the District office. [redacted] states that the employee could stun (with a portable stunner) the animals right outside in the pen next to the stunning booth. There were three (total) animals that appeared to be non -ambulatory and one other animal with it's front right leg injured and walking on only three legs (I requested to see him move at this point). After plugging the portable stunner up and trying to stun the first animal, the stunner was not working the animal was clearly uncomfortable again the employee tried to stun the animals but to no avail. [redacted] at that point called by radio for establishment maintenance to come to the stunning area. Waiting for the maintenance man to arrive, I at that point (having orally stopped all production) went to the USDA office to call the District Office (leaving message) and immediately (within 3-4 minutes) returning to the stunning area to find that all three non-ambulatory had been stunned, bleed and hanging at the hotpot and the fourth animal being stunned. I informed the supervisor [redacted] that these animals were suspect and no blood should be used and that I would be tagging these animals for disposition from my immediate supervisor whom I called and discussed this situation. He instructed me to release product (carcasses) and agreed that there was non-compliance which was very evident. At that point I made a request to see the establishment's video surveillance tape of the area in question for that time period. *Please note that I realize the establishment is not under any requirement to show me their security devices or recordings and the request was made as strictly that a request, and being noted here for informative information of time and sequence of events. Given the severity of this incident and the establishment resuming product before I released area, I was taking every measure to insure the animals were properly handled while I went to call and inform the DO. The request was denied. However the establishment did request to speak with me to discuss my concerns.

(b)(6), (b)(7)(c)

11. SIGNATURE OF INSPECTION PROGRAM EMPLOYEE: [redacted]

15. DATE

FSIS FORM 5400-4 (7/98) Replaces FSIS Form 5400-4 (9/97), which may be used until exhausted.(7/98) DISTRIBUTION: Original & 1 copy - Establishment 1 copy - Inspector

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Columbia Packing Company

(b)(6)

NR 57-2004

November 12, 2004

Immediate Actions: All suspected hogs involved in the incident described in NR 57-2004 were stunned properly before being shackled. Columbia Supervisor, [redacted] oversaw this event to ensure proper procedures were followed. Per instructions from [redacted], blood from these hogs was not kept.

(b)(6), (b)(7)(e)

Further Planned Actions: Employees involved in the handling of livestock met on November 12, 2004 at 5:00AM for an informative counseling session discussing humane handling of animals. All humane handling regulations 9CFR 313.2 were discussed and reviewed for proper actions. Furthermore, employees were reminded of the proper procedures to follow when the inspector informs them to stop production. Supervisors will be monitoring humane handling to ensure all regulations are being implemented and followed by employees. Both supervisors for the kill floor, Quality Control Manager, and owner [redacted] were present at this session. See attached paperwork which documents the training and which employees attended.

Reference NR 20-2004 EST 19789- 4L Processing (b)(6), (b)(7)(c)

Upon visiting the plant on Wednesday, September 1, 2004, I conferred with [redacted] His observations were that many of the hog stomachs he observed, during his post mortem inspection, were empty or filled with water only.

The slaughter schedule for EST 19789 is, usually, [redacted] (b)(4)

(b)(6), (b)(7)(c)

In regard to [redacted] comments, I began an investigation of the feeding practice at EST 19789. I observed the large storage pens for residue of feed and saw little to none. I observed the pile of "deer corn" they were using to feed the hogs and the number of sacks present. There are also 4 small pens used for Ante Mortem (AM) near the entrance of the kill floor. Hogs are brought down from the large holding pens about [redacted] at a time for Ante Mortem and then slaughter. In one of these smaller pens the plant was keeping smaller hogs (BBQs or Roasters). There was corn present in this pen. [redacted] explained, once, that these hogs couldn't afford to lose any weight. (b)(4)

Upon returning to the plant on Thursday, September 2, I, again, conferred with [redacted] and he commented that: (b)(6), (b)(7)(c

1. the small hogs from the small AM pens clearly had feed in their stomachs and intestines.
2. when the slaughter for the larger hogs from the large holding pens started, he observed that the stomachs were filled only with a colored liquid (water).

I made a similar observation during the 10:00 hour on these hogs. I also observed the deer corn pile and it appeared unchanged. Another significant point is that when these hogs arrive on Monday, after a considerable amount of time on the transport truck, there usually is feed still remaining in the stomach. However, by Wednesday, the 2nd day of slaughter (3rd day after arrival) for the week, the stomachs were empty.

It, therefore, appeared that the hogs had not been fed as required by the regulations. On September 2, 2004 NR 20-2004 was written and issued.

(b)(6), (b)(7)(c)

On Tuesday September 7, 2004, the following week, another lot of hogs arrived at EST 19789 and they started the slaughter on the day of arrival. Since this was the day of arrival, no feeding was required. [redacted] and I reviewed the stomachs of slaughtered hogs and found that all the stomachs we checked had feed in them even though they had been in transit for some time. On Wednesday, September 8th, the second day of slaughter, we checked stomachs again. At 3:00 PM, we still found some stomachs with feed in them. Since this day was a required feeding day, I supervised the feeding of the lot of hogs. The hogs were fed corn at a rate of [redacted] (b)(4)

(b)(6), (b)(7)(c)

On the 3rd day after arrival (Sep 9, 04) [redacted] and I again observed stomachs and all of the stomachs we checked had obvious feed in them. I went to the holding pens were they were kept overnight and observed the remains of yesterdays feeding. There were kernels of corn around the edges of the pen which had pushed out by the hogs. On the pavement near the feeding area, there were [redacted] kernels of corn per square foot and in the distant areas there were [redacted] kernels per square foot.

(b) (4)

My conclusion is that if hogs have been fed in the past 24 hours, you will see remains of the feed in the stomach (and usually in the holding pen) and that this is a reliable means of determining recent feeding. I recommend this method.

[redacted]

(b)(6), (b)(7)(c)

s.(b)(6) s.(b)(7)(C)

U.S. DEPARTMENT OF AGRICULTURE
FOOD SAFETY AND INSPECTION SERVICE

NONCOMPLIANCE RECORD

TYPE OF NONCOMPLIANCE: ☐ Food Safety ☒ Other Consumer Protection

1. DATE	2. RECORD NO.	3. ESTABLISHMENT NO.
1/7/04	3-2004-1664	01628 M / 1

4. TO (*Name and Title*): Mr. John Anderson, President/GM

5. PERSONNEL NOTIFIED: Kathleen Coburn (Plant Manager)

6. RELEVANT REGULATION(S): 313.30 (a)(1), (a)(4), (b)(2), (b)(3)

7. RELEVANT SECTION/PAGE OF ESTABLISHMENT PROCEDURE/PLAN	HACCP	SSOP	OTHER
			Electric Stunning

8. ISP CODE: 04C02

9. NONCOMPLIANCE CLASSIFICATION INDICATORS

PLANT PROCESS	A. ☐ SSOP	☐ Monitoring	☐ Corrective Action	☐ Recordkeeping	☐ Implementation	
	B. ☐ HACCP	☐ Monitoring	☐ Corrective Action	☐ Recordkeeping	☐ Plant Verification	
C.	☒ PRODUCT	☐ Economic	☐ Misbranding	☒ Protocol		
D.	☐ FACILITY	☐ Lighting	☐ Structural	☐ Outside Premises	☐ Product Based	
E.	☐ E. COLI	☐ Other				

10. DESCRIPTION OF NONCOMPLIANCE:

On 7 January 2004 at approximately 0910 hrs, Inspector [redacted] informed me that the establishment was having problems with the electric stunner. Inspector [redacted] said at 0903 hrs, [redacted] asked [redacted] (operator of the stunner) how the stunner was working due to the fact that the plant has had difficulties with the stunner in the recent past while [redacted] was performing an 04C02 procedure. Inspector [redacted] said, [redacted] replied with there is some problems with a screw coming out of the gun. Inspector [redacted] then informed [redacted] that if it was not causing a problem with the stunning that he may go ahead and continue then fix the stunner before starting back up after lunch. Inspector [redacted] said that [redacted] answered

[redacted]TION PROGRAM EMPLOYEE [redacted]

You are hereby advised of your right to appeal this decision as delineated by 306.5 and/or 381.35 of 9 CFR.

12. PLANT MANAGEMENT RESPONSE (*Immediate actions(s)*):

MADE IT ARE OUT
-DIRT & WATER IN THE STUNNER AFTER [redacted]
CLEANED IT, WAS WORKING FINE.

13. PLANT MANAGEMENT RESPONSE (*further planned actions(s)*):

[redacted] TO KEEP THE HANDEL CLEAN.

This document serves as written notification that your failure to comply with regulatory requirement(s) could result in additional regulatory or administrative action.

14. SIGNATURE OF PLANT MANAGEMENT	15. DATE
[signature]	1-9-04
16. VERIFICATION SIGNATURE OF INSPECTION PROGRAM EMPLOYEE [redacted]	17. DATE 1-9-04

FSIS FORM 5400-4 (7/98) Replaces FSIS Form 5400-4 (9/97), which may be used until exhausted.(7/98)

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1 copy - Inspector

s.(b)(6)
s.(b)(7)(C)

U.S. DEPARTMENT OF AGRICULTURE
FOOD SAFETY AND INSPECTION SERVICE

NONCOMPLIANCE RECORD CONTINUATION SHEET

TYPE OF NONCOMPLIANCE
☐ Food Safety ☒ Other Consumer Protection

1. DATE	2. RECORD NO.	3. ESTABLISHMENT NO.
1/7/04	3-2004-1664	01628 M / 1

4. TO (*Name and Title*)	5. PERSONNEL NOTIFIED
Mr. John Anderson, President/GM	Kathleen Coburn (Plant Manager)

6. RELEVANT REGULATION(S)
313.30 (a)(1), (a)(4), (b)(2), (b)(3)

7. RELEVANT SECTION/PAGE OF ESTABLISHMENT PROCEDURE/PLAN	HACCP	SSOP	OTHER
			Electric Stunning

8. ISP CODE	9. NONCOMPLIANCE INDICATOR
04C02	Product Protocol

10. DESCRIPTION OF NONCOMPLIANCE:

with ok and began knocking two more hogs at 0907 hrs. Inspector (said that when stunned the two hogs and hoisted them in the air to be bled, one of the hogs started kicking repetitively and came loose from the chain shackle that was around it's rear leg. Inspector said that the hog landed on the kill floor, then got up and started running around. Inspector said that grabbed the hog and called for another employee to help put it back into the knocking box. Inspector said then informed to stop the kill until the stunner was fixed correctly. Inspector said he then informed (slaughter foreman) of the situation and then proceeded to the USDA inspection office to inform me (Inspector). Upon being informed by Inspector I immediately check the knock box and observed the previously stunned hog standing there. I then proceeded to the processing room to inform Kathleen (Plant Manager) of the situation and that the kill had been stopped until the stunner was fixed. At approximately 1000 hrs Mr. John Anderson (President/GM) informed me that the stunner was fixed. Myself and Inspector proceeded to the knock box to observe the stunning of two hogs. After observing the stunning, shackling, and bleeding of the two hogs, I informed the plant that they may resume killing. Section 313.30 (a)(1) of the Code of Federal Regulations states " The electric current shall be administered so as to produce, at a minimum, surgical anesthesia, i.e., a state where the animal feels no painful sensation. The animals shall be either stunned or killed before they are shackled, hoisted, thrown, cast, or cut. They shall be exposed to the electric current in a way that will accomplish the desired result quickly and effectively, with a minimum of excitement and discomfort". Section 313. 30 (a)(4) states "The stunned animal shall remain in a state of surgical anesthesia through shackling, sticking, and bleeding". Section 313.30 (b)(2) states "All equipment used to apply and control the electrical current shall be maintained in good repair, and all indicators, instruments, and measuring devices shall be available for inspection by Program inspectors during the operation and at other times". Section 313.30 (b)(3) states "Each animal shall be given a sufficient application of electric current to ensure surgical anesthesia throughout the bleeding operation. Suitable timing, voltage and current control devices shall be used to ensure that each animal receives the necessary electrical charge to produce immediate unconsciousness. The current shall be applied so as to avoid the production of hemorrhages or other tissue changes which could interfere with inspection procedures".
This document serves as written notification of your failure to comply with the Code of Federal Regulations part 313. 30.

11. SIGNATURE OF INSPECTION	15. DATE
	1-8-04

s.(b)(6)
s.(b)(7)(C)

U.S. DEPARTMENT OF AGRICULTURE
FOOD SAFETY AND INSPECTION SERVICE

NONCOMPLIANCE RECORD

TYPE OF NONCOMPLIANCE: ☐ Food Safety ☒ Other Consumer Protection

1. DATE	2. RECORD NO.	3. ESTABLISHMENT NO.
2/10/04	2-2004-5656	06208 M / 1

4. TO (*Name and Title*): Aster Ramos, Production Manager

5. PERSONNEL NOTIFIED:

6. RELEVANT REGULATION(S): 313.5(b)(2)

7. RELEVANT SECTION/PAGE OF ESTABLISHMENT PROCEDURE/PLAN	HACCP	SSOP	OTHER

8. ISP CODE: 04C02

9. NONCOMPLIANCE CLASSIFICATION INDICATORS

PLANT PROCESS	A. ☐ SSOP	☐ Monitoring	☐ Corrective Action	☐ Recordkeeping	☐ Implementation
	B. ☐ HACCP	☐ Monitoring	☐ Corrective Action	☐ Recordkeeping	☐ Plant Verification
C. ☒ PRODUCT		☐ Economic	☐ Mislabeling	☒ Protocol	
D. ☐ FACILITY		☐ Lighting	☐ Structural	☐ Outside Premises	☐ Product Based
E. ☐ E. COLI		☐ Other			

10. DESCRIPTION OF NONCOMPLIANCE

At approximately 1400 hours during swine slaughter operations, I was observing the carbon dioxide stunning operation. At the end of one of the stunning cycles, the two hogs in the stunning chamber rose to the top of the chamber to be dumped onto the table for shackling and hoisting. However, one of the hogs had his snout stuck in a crevice in such a way that he could not be physically removed from the chamber. The animal eventually regained consciousness while still stuck in this position. This constitutes a failure to meet regulatory requirements for humane slaughter.

The lead person was informed of the situation and the plant owner was called to the plant. The animal was stuck in

11. SIGNATURE OF INSPECTION PROGRAM EMPLOYEE

You are hereby advised of your right to appeal this decision as delineated by 306.5 and/or 381.35 of 9 CFR.

12. PLANT MANAGEMENT RESPONSE (*Immediate actions(s)*):

13. PLANT MANAGEMENT RESPONSE (*Further planned actions(s)*):

This document serves as written notification that your failure to comply with regulatory requirement(s) could result in additional regulatory or administrative action.

14. SIGNATURE OF PLANT MANAGEMENT	15. DATE
16. VERIFICATION SIGNATURE OF INSPECTION PROGRAM EMPLOYEE	17. DATE

FSIS FORM 5400-4 (7/98) — Replaces FSIS Form 5400-4 (9-97), which may be used until exhausted (7/98)

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s.(b)(6)
s.(b)(7)(C)

U.S. DEPARTMENT OF AGRICULTURE
FOOD SAFETY AND INSPECTION SERVICE

NONCOMPLIANCE RECORD CONTINUATION SHEET

TYPE OF NONCOMPLIANCE: ☐ Food Safety ☒ Other Consumer Protection

1. DATE	2. RECORD NO.	3. ESTABLISHMENT NO.
2/10/04	2-2004-5656	06208 M / 1

4. TO (Name and Title)	5. PERSONNEL NOTIFIED
Aster Ramos, Production Manager	

6. RELEVANT REGULATION(S)
313.5(b)(2)

7. RELEVANT SECTION/PAGE OF ESTABLISHMENT PROCEDURE/PLAN	HACCP	SSOP	OTHER

8. ISP CODE	9. NONCOMPLIANCE INDICATOR
04C02	Product Protocol

10. DESCRIPTION OF NONCOMPLIANCE

this position for approximately 30 minutes.

After the animal was freed, it was stunned using a captive bolt device and I allowed production to resume.

9CFR Part 313 Section 5(b)(2) states: "The ability of anesthetizing equipment to perform with maximum efficiency is dependent on its proper design and efficient mechanical operation. Pathways, compartments, gas chambers, and all other equipment used must be designed to accommodate properly the species of animals being anesthetized. They shall be free from pain-producing restraining devices. Injury of animals must be prevented by the elimination of sharp projections or exposed wheels or gears. There shall be no unnecessary holes, spaces or openings where feet or legs of animals may be injured..."

This document serves as written notification that your failure to comply with regulatory requirements could result in additional regulatory or administrative action.

s.(b)(6)

s.(b)(7)(C)

U.S. DEPARTMENT OF AGRICULTURE
FOOD SAFETY AND INSPECTION SERVICE

NONCOMPLIANCE RECORD

TYPE OF NONCOMPLIANCE: [X] Food Safety [X] Other Consumer Protection

1. DATE	2. RECORD NO.	3. ESTABLISHMENT NO.
5/27/2004	5-2004-6547	06208 M 1

4. TO (Name and Title): Aster Ramos, Production Manager

5. PERSONNEL NOTIFIED:

6. RELEVANT REGULATION(S): 313.30(a)(4); (b)(3)

7. RELEVANT SECTION/PAGE OF ESTABLISHMENT PROCEDURE/PLAN	HACCP	SSOP	OTHER

8. ISP CODE: 04C02

9. NONCOMPLIANCE CLASSIFICATION INDICATORS

PLANT PROCESS	A. [ ] SSOP	[ ] Monitoring	[ ] Corrective Action	[X] Recordkeeping	[ ] Implementation
	B. [ ] HACCP	[ ] Monitoring	[X] Corrective Action	[ ] Recordkeeping	[ ] Plant Verification
C. [X] PRODUCT	[ ] Economic	[ ] Misbranding	[X] Protocol		
D. [ ] FACILITY	[ ] Lighting	[ ] Structural	[ ] Outside Premises	[ ] Product Based
E. [ ] E. COLI	[ ] Other			

10. DESCRIPTION OF NONCOMPLIANCE

On this date at approximately 1520 hours, during swine slaughter operations, I heard a hog vocalize loudly. From my inspection station, I could see the stunner looking toward the bleeding and scalder/dehairing areas and smiling. I immediately walked over to investigate and realized that the animal was already in the scald tank, no more than 15 seconds from when I heard the vocalization. There were no other animals on the line, as this was the last hog to be slaughtered this day. It became apparent that the animal had been vocalizing after having been stunned with electrical current, hoisted, and bled. When the carcass arrived at the post-mortem inspection station, I observed

11. SIGNATURE OF INSPECTION PROGRAM EMPLOYEE

You are hereby advised of your right to appeal this decision as delineated by 306.5 and/or 381.35 of 9 CFR.

12. PLANT MANAGEMENT RESPONSE *(Immediate actions(s))*:

No corrective measures implemented as the hog was already at the scalding tank.

13. PLANT MANAGEMENT RESPONSE *(Further planned actions(s))*:

See Preventive measures at the next addendum page

This document serves as written notification that your failure to comply with regulatory requirement(s) could result in additional regulatory or administrative action.

14. SIGNATURE OF PLANT MANAGEMENT

15. DATE 5-28-04

16. VERIFICATION SIGNATURE OF INSPECTION PROGRAM EMPLOYEE

17. DATE

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s.(b)(6)

s.(b)(7)(C)

U.S. DEPARTMENT OF AGRICULTURE
FOOD SAFETY AND INSPECTION SERVICE

TYPE OF NONCOMPLIANCE: [ ] Food Safety [X] Other Consumer Protection

NONCOMPLIANCE RECORD CONTINUATION SHEET

1. DATE	2. RECORD NO.	3. ESTABLISHMENT NO.
5/27/2004	5-2004-6547	06208 M 1

4. TO (Name and Title)	5. PERSONNEL NOTIFIED
Aster Ramos, Production Manager	

6. RELEVANT REGULATION(S)			
313.30(a)(4), (b)(3)			
7. RELEVANT SECTION/PAGE OF ESTABLISHMENT PROCEDURE/PLAN	HACCP	SSOP	OTHER

8. ISP CODE	9. NONCOMPLIANCE INDICATOR
04C02	Product Protocol

10. DESCRIPTION OF NONCOMPLIANCE

that the lungs had areas that appeared to be "cooked" and the air passageways contained large amounts of water, indicating that the animal was still breathing when it entered the scalding tank. I took no regulatory control action at the time of occurrence because it was the final animal of the day.

This incident constitutes a failure by the establishment to comply with federal regulations governing humane slaughter of livestock.

I immediately notified [redacted] lead person, of the incident.

9 CFR Part 313.30(a)(4) states: ""Administration of electric current, required effect, handling. The stunned animal shall remain in a state of surgical anesthesia through shackling, sticking, and bleeding.

9 CFR Part 313.30(b)(3) states: ""Facilities and procedures, operator - Electric current. Each animal shall be given a sufficient application of electric current to ensure surgical anesthesia throughout the bleeding operation. Suitable timing, voltage and current control devices shall be used to ensure that each animal receives the necessary electrical charge to produce immediate unconsciousness."

It appears that the animal was inadequately stunned and/or bled and that the scalding tank operator failed to allow enough time for the animal to die after being stunned and bled.

This document serves as written notification that your failure to comply with regulatory requirements could result in additional regulatory or administrative action.

s.(b)(6)
s.(b)(7)(C)

U.S. DEPARTMENT OF AGRICULTURE
FOOD SAFETY AND INSPECTION SERVICE

NONCOMPLIANCE RECORD

TYPE OF NONCOMPLIANCE: ☐ Food Safety ☒ Other Consumer Protection

1. DATE	2. RECORD NO.	3. ESTABLISHMENT NO.
7/14/03	108-2003-1129	13597 M / 2

4. TO (*Name and Title*): Ken Wilson, Operations Manager

5. PERSONNEL NOTIFIED:

6. RELEVANT REGULATION(S): CFR 9 Part 313.30(2)Directive 6900.1 Part 2 1.A.i

7. RELEVANT SECTION/PAGE OF ESTABLISHMENT PROCEDURE/PLAN	HACCP	SSOP	OTHER
			64 d and page 5

8. ISP CODE: 04C02

9. NONCOMPLIANCE CLASSIFICATION INDICATORS

PLANT PROCESS	A. ☐ SSOP	☐ Monitoring	☐ Corrective Action	☐ Recordkeeping	☐ Implementation	
	B. ☐ HACCP	☐ Monitoring	☐ Corrective Action	☐ Recordkeeping	☐ Plant Verification	
C.	☒ PRODUCT	☐ Economic	☐ Misbranding	☒ Protocol		
D.	☐ FACILITY	☐ Lighting	☐ Structural	☐ Outside Premises	☐ Product Based	
E.	☐ E COLI	☐ Other				

10. DESCRIPTION OF NONCOMPLIANCE:

At approximately 8:00 PM I was on my way out to perform A/M inspection. As I passed through the bleed area I looked through the window to the room where the "stress hogs" are brought up on a trailer prior to their being slaughtered. I noticed there were hogs on the trailer. I went into the room which is not significantly larger than the trailer. The room has no ventilation and was very warm. There were 13 hogs on the trailer and they were panting with the heat and very uncomfortable. The sticking crew had just gone on break and would not be back for about 30 minutes. So these hogs could not begin to be slaughtered for at least 30 minutes. There was not a supervisor available .

11. SIGNATURE OF INSPECTION PROGRAM EMPLOYEE

You are hereby advised of your right to appeal this decision as delineated by 306.5 and/or 381.35 of 9 CFR.

12. PLANT MANAGEMENT RESPONSE *(immediate actions(s))*:

All hogs were slaughtered. Management had a maintenance install a spray bar over the hog trailer.

13. PLANT MANAGEMENT RESPONSE *(further planned actions(s))*:

A meeting was held with all senior management, it was determined that all stressor hogs in the stick area will be killed prior to going to break.

This document serves as written notification that your failure to comply with regulatory requirement(s) could result in additional regulatory or administrative action.

14. SIGNATURE OF PLANT MANAGEMENT	15. DATE
Michael M. Senne, Ph. D.	7/16/2003
16. VERIFICATION SIGNATURE OF INSPECTION PROGRAM EMPLOYEE	17. DATE
	7/22/03

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s.(b)(6)
s.(b)(7)(C)

U.S. DEPARTMENT OF AGRICULTURE
FOOD SAFETY AND INSPECTION SERVICE

NONCOMPLIANCE RECORD CONTINUATION SHEET

TYPE OF NONCOMPLIANCE
☐ Food Safety ☒ Other Consumer Protection

DATE	2. RECORD NO.	3. ESTABLISHMENT NO
7/14/03	108-2003-1129	13597 M / 2

4 TO (*Name and Title*)
Ken Wilson, Operations Manager

5. PERSONNEL NOTIFIED

6. RELEVANT REGULATION(S)
CFR 9 Part 313.30(2)Directive 6900.1 Part 2 1.A.i

7. RELEVANT SECTION/PAGE OF ESTABLISHMENT PROCEDURE/PLAN	HACCP	SSOP	OTHER
			64 d and page 5

8. ISP CODE	9. NONCOMPLIANCE INDICATOR
04C02	Product Protocol

10. DESCRIPTION OF NONCOMPLIANCE:

I saw the plant person who does the HACCP "inhumane handling". I asked [redacted] to call some one on the radio to do something with the hogs .....or the were going to die . I did not put a tag on the hogs or the room because the plant wouldn't be able to move them to a cooler environment if that's how they decided to handle the situation.
I proceeded on with the A/M inspection. When I got to the Scale House [redacted] and [redacted] were both there and assured me the situation was being taken care of.
After finishing A/M I proceeded back to the bleeding area to check on the hogs. I hadn't seen or heard the "stress trailer" go by, so I assumed the plant had opted to water the hogs to cool them down.
At approximately 8:30 I looked in on the hogs to find their situation had not changed. They had not put water in the trailer or moved them to a cooler area. Now two (2) of the 13 were dead. I again had someone call [redacted] and [redacted] to the trailer of hogs. The overhead door was opened and water put in the trailer for the hogs to lay in.
The "bleed crew" came back from dinner at 8:30 so the remainder of the hogs were slaughter rapidly and effectively .
313.30(2) states "Delivery of calm animals to the place of application is essential to ensure rapid and effective insensibility." CFR9 Part 313.30(2)i also states Ensure that any disabled livestock are protected from adverse weather conditions after they enter official establishment premises.

 s.(b)(6) s.(b)(7)(C)

U.S. DEPARTMENT OF AGRICULTURE
FOOD SAFETY AND INSPECTION SERVICE

NONCOMPLIANCE RECORD

TYPE OF NONCOMPLIANCE: [ ] Food Safety [X] Other Consumer Protecti

1. DATE	2. RECORD NO.	3. ESTABLISHMENT NO.
11/24/2004	138-2004-7851	13597 M / 1

4. TO (*Name and Title*): Stan Scott, President/GM

5. PERSONNEL NOTIFIED:

6. RELEVANT REGULATION(S): 313.2

7. RELEVANT SECTION/PAGE OF ESTABLISHMENT PROCEDURE/PLAN | HACCP | SSOP | OTHER: Page 1

8. ISP CODE: 04C02

9. NONCOMPLIANCE CLASSIFICATION INDICATORS

PLANT PROCESS	A. [ ] SSOP	[ ] Monitoring	[ ] Corrective Action	[ ] Recordkeeping	[ ] Implementation
	B. [ ] HACCP	[ ] Monitoring	[ ] Corrective Action	[ ] Recordkeeping	[ ] Plant Verification
C.	[X] PRODUCT	[ ] Economic	[ ] Misbranding	[X] Protocol	
D.	[ ] FACILITY	[ ] Lighting	[ ] Structural	[ ] Outside Premises	[ ] Product Based
E.	[ ] E. COLI	[ ] Other			

10. DESCRIPTION OF NONCOMPLIANCE:

At 0725, while going to give post mortem inspectors breaks, I observed a hog railed out by the GS-7 rail inspector. The hog was retained with retain tag number 335978. The left ham of this hog had 25 prod marks from very dark brown to light colored. These marks were round and about half the size of a dime. A small piece of this skin was saved by the plant. The piece saved had 18 prod marks on it. When I ask the supervisor in the area if had shown the SVMO shrugged shoulders and said "we have seen them before". The suffering of even one animal should not be met with callous disregard even if it does occur at other times. Since I observed this one

11. SIGNATURE OF INSPECTION PROGRAM EMPLOYEE

000052 ...n as delineated by 306.5 and/or 381.35 of 9 CFR

12. PLANT MANAGEMENT RESPONSE (Immediate actions(s)):

 s.(b)(6) s.(b)(7)(C)

U.S. DEPARTMENT OF AGRICULTURE
FOOD SAFETY AND INSPECTION SERVICE

NONCOMPLIANCE RECORD CONTINUATION SHEET

TYPE OF NONCOMPLIANCE: ☐ Food Safety ☒ Other Consumer Protection

1. DATE	2. RECORD NO.	3. ESTABLISHMENT NO.
11/24/2004	138-2004-7851	13597 M / 1

4 TO (*Name and Title*): Stan Scott, President/GM

5. PERSONNEL NOTIFIED:

6. RELEVANT REGULATION(S): 313.2

7. RELEVANT SECTION/PAGE OF ESTABLISHMENT PROCEDURE/PLAN	HACCP	SSOP	OTHER
			Page 1

8. ISP CODE	9. NONCOMPLIANCE INDICATOR
04C02	Product Protocol

10. DESCRIPTION OF NONCOMPLIANCE:

what ever had caused the injuries to the others that the supervisor had seen had not been corrected. The plants humane handling procedure states: Electric prods may be used in the staging area and the irons, but only sparingly. Since no one saw this hog abused it is impossible to say exactly when it was abused. The pen card show this hog was a Seaboard hog from a Seaboard farm. The SVMO said that the wounds were less than 12 hours old. The supervisor where the hogs are driven, stunned and stuck said that the hogs were driving hard today. said that didn't think the prod marks were caused by the prods used in the staging area.

9 CFR 313.2(a) states: Electric prods, camas sappers, or other implements employed to drive animals shall be used as little as possible in or to minimize excitement and injury. Any use of such implements which, in the opinion of he inspector, is excessive, is prohibited.

This document serves as written notification that your failure to comply with regulatory requirement(s) could result in additional regulatory or administrative action.

you are hereby advised of your right to appeal this decision as delineated by 306.5(a) and/or 381.35 of 9 CFR.

11. SIGNATURE OF INSPECTION PROGRAM EMPLOYEE	15. DATE

FSIS FORM 5400-4 (7/98) Replaces FSIS Form 5400-4 (9/97), which may be used until exhausted.(7/98) DISTRIBUTION: Original & 1 copy - Establishmer 1 copy - Inspector

s.(b)(6)
s.(b)(7)(C)

SEABOARD FARMS INC.

December 6, 2004

[redacted]

FSIS Inspector In Charge
Establishment #13597
Guymon, Oklahoma 73942

Re: Appeal of Non-Compliance Report # 138-2004-7851

Seaboard Farms, Inc., Establishment #13597, respectfully appeals Non-Compliance Report #138-2004-7851, to the Inspector-In-Charge of the Establishment. The reasons and support for our appeals include, but are not limited to, the explanations and documentation described below.

Appeal of NR#138-2004-7851

1. The Establishment does not feel a non-compliance occurred.
2. The NR #138-2004-7851 was written in response to lesions or marks on the skin surface of a carcass. These marks as described by the inspector were round and approximately half the size of a dime. The violation as stated in the NR in question was that an inhumane act had occurred by use of Electric prods. Skin samples collected from the carcass in question were examined. All gross pathology indicates that the lesions identified were not from prod use but from other causes. The lesions were of mild occurrence with no abrasion permeating through the dermal layer. Possibly, a result of an insect bite or from a mild form of Tinea infection of the skin that becomes darkened from the scalding process. Review of CFR 313.2(a) the Establishment would conclude no violation occurred.
3. Investigations completed with handling personnel revealed no deviations had occurred throughout the handling process. Also, investigations conducted on the live side program concluded that use of prods, electric or not, are not used in the normal handling procedures and were not used on the group of animals that were delivered to the Guymon Plant.

In summary the Establishment would like to state that procedures were followed to maintain each animal is handled in a humane manner compliant with the CFR.

Thank you for your time and consideration of this appeal.

Respectfully submitted

[redacted]

Food Safety Manager
Seaboard Farms, Inc.

s.(b)(6)
s.(b)(7)(C)

USDA United States Department of Agriculture
Food Safety and Inspection Service
2700 Northeast 26th Street
Guymon, OK
73942

December 17, 2004

To: [redacted]
Food Safety Manager

From: [redacted], D.V.M.

IIC, Est. 13597 M

Subject: Appeal of Noncompliance Record 138-2004-7851 on November 24, 2004.

After reviewing the Non-Compliance Record 138-2004-7851, dated November 24, 2004, reasons stated in your appeal, and laboratory findings, the appeal of said Non-Compliance is granted. The reasons stated in your appeal are consistent with FSIS determinations.

Respectfully

[redacted]
DVM

s.(b)(6)
s.(b)(7)(C)

US Department of Agriculture
FOOD SAFETY AND INSPECTION SERVICE
NONCOMPLIANCE RECORD

TYPE OF NONCOMPLIANCE
☐ Food Safety ☒ Other Consumer Protection

1. DATE	2. RECORD NO.	3. ESTABLISHMENT NO.
05/04/2005	0034-2005-7851	13597 M / 1

4. TO (Name and Title)
Stan Scott, President/GM

5. PERSONNEL NOTIFIED

6. RELEVANT REGULATION(S)
313.2 (e)

7. SECTION/PAGE OF EST. PROCEDURE PLAN	HACCP	SSOP	OTHER

8. ISP CODE	9. NONCOMPLIANCE CLASSIFICATION INDICATORS
04C02	PRODUCT - Protocol

10. DESCRIPTION OF NONCOMPLIANCE

District Veterinary Medical Specialist, observed the lack of water available in the receiving pens when the pens are used to hold swine until other holding pens become available. The swine received are sometimes held for an extended time in the receiving pens. The duality of purpose of the receiving pens would require that water be made available during the time the swine are held in those pens for an extended length of time. Regulation 313.2 (e): Animal shall have access to water in all holding pens and, if held longer than 24 hours, access to feed. There shall be sufficient room in the holding pen for animals held overnight to lie down. This document serves as written notification that your failure to comply with regulatory requirements could result in additional regulatory or administrative action. You are hereby advised of your right to appeal this decision as described in Regulation 306.5

11. SIGNATURE OF INSPECTION PROGRAM EMPLOYEE

You are hereby advised of y *.35 of 9 CFR.*

12. PLANT MANAGEMENT RESPONSE (Immediate action(s)):

Two water hoses were immediately put in each receiving alley, constantly running.

13. PLANT MANAGEMENT RESPONSE (further planned action(s)):

Water nipples were installed in the drive alleys to ensure hogs have access to water in the event these areas are used as holding pens.

This document serves as written notification that your failure to comply with regulatory requirement(s) could result in additional regulatory or administrative action.

14. SIGNATURE OF PLANT MANAGEMENT

15. DATE
6/15/05

16. E

17. DATE
09/01/05

FSI
Re

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Page 1 of 1

s.(b)(6)
s.(b)(7)(C)

Request for this information is Voluntary. It is needed to monitor defects found in this inspection system. It is used by FSIS to determine whether establishments are in compliance. 9CFR 301 and 9CFR 381. FORM APPROVED OMB NO. 0583-0089. OMB DISCLOSURE STATEMENT: Public reporting burden for this collection of information is estimated to average 7 minutes per response, including the time for reviewing instructions, searching existing data soures, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Department of Agriculture, Clearance Officer, OIRM, Room 404-W, Washington, D.C. 20250; and to the Office of Information and Regulatory Affairs, Office of Management and Budget.

U.S. DEPARTMENT OF AGRICULTURE
FOOD SAFETY AND INSPECTION SERVICE

NONCOMPLIANCE RECORD

TYPE OF NONCOMPLIANCE: [ ] Food Safety [X] Other Consumer Protection

1. DATE	2. RECORD NO.	3. ESTABLISHMENT NO.
11/19/03	145-2003-1043	02325 M / 1

4. TO (*Name and Title*): Brad Davis, President/GM

5. PERSONNEL NOTIFIED: Brad Davis

6. RELEVANT REGULATION(S): 313.15

7. RELEVANT SECTION/PAGE OF ESTABLISHMENT PROCEDURE/PLAN	HACCP	SSOP	OTHER
			N/A

8. ISP CODE: 04C02

9. NONCOMPLIANCE CLASSIFICATION INDICATORS

PLANT PROCESS	A. [ ] SSOP	[ ] Monitoring	[ ] Corrective Action	[ ] Recordkeeping	[ ] Implementation	
	B. [ ] HACCP	[ ] Monitoring	[ ] Corrective Action	[ ] Recordkeeping	[ ] Plant Verification	
C.	[X] PRODUCT	[ ] Economic	[ ] Misbranding	[X] Protocol		
D.	[ ] FACILITY	[ ] Lighting	[ ] Structural	[ ] Outside Premises	[ ] Product Based	
E.	[ ] E. COLI	[ ] Other				

10. DESCRIPTION OF NONCOMPLIANCE:

At approximately 6:25 while watching a employee stun a boar hog with a mechanical captive bolt stunner. One employee hit the hog from the floor and it did not stun the hog, then another employee that was not trained hit it from on top of the chute with the mechanical captive bolt stunner and it did not stun the animal. The third employee was trained but the stunner missed fired two times and then it hit but the animal went to its front knees and was not completely stunned then the employee got on the floor and hit the animal again this time it stunned the animal. There was a tag placed on the stunning booth at approximately 6:30 a.m. tag # B36374415 and a verbal preventive measure

11. SIGNATURE OF INS[redacted]

You are hereby advised of [redacted] *.35 of 9 CFR*

12. PLANT MANAGEM[redacted]

See Attached

13. PLANT MANAGEMENT RESPONSE (*further planned actions(s)*):

This document serves as written notification that your failure to comply with regulatory requirement(s) could result in additional regulatory or administrative action.

14. SIGNATURE OF PLANT MANAGEMENT [redacted]

15. DATE: 11/19/03

[redacted] RAM EMPLOYEE

17. DATE: 11/19/03

es FSIS Form 5400-4 (9/97), which may be used until exhausted.(7/98)

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U.S. DEPARTMENT OF AGRICULTURE
FOOD SAFETY AND INSPECTION SERVICE

NONCOMPLIANCE RECORD CONTINUATION SHEET

TYPE OF NONCOMPLIANCE
☐ Food Safety ☒ Other Consumer Protection

1. DATE	2. RECORD NO.	3. ESTABLISHMENT NO.
11/19/03	145-2003-1043	02325 M / 1

4. TO (*Name and Title*)	5. PERSONNEL NOTIFIED
Brad Davis, President/GM	Brad Davis

6. RELEVANT REGULATION(S)
313.15

7. RELEVANT SECTION/PAGE OF ESTABLISHMENT PROCEDURE/PLAN	HACCP	SSOP	OTHER
			N/A

8. ISP CODE	9. NONCOMPLIANCE INDICATOR
04C02	Product Protocol

10. DESCRIPTION OF NONCOMPLIANCE:

was given immediately followed with a written preventive action and tag was removed at approximately 6:45 AM. There is no previous NR written with the same cause. This is a failure to comply with FSIS regulation 313.15 (a)(1) which states. The captive bolt stunner shall be applied to the livestock in accordance with this section so as to produce immediate unconsciousness in the animals before they are shackled, hoisted, thrown, cast, or cut. The animals shall be stunned in such a manner that they will be rendered unconscious with a minimum of excitement and discomfort. Continued failure to meet these regulatory requirements could result in additional regulatory or administrative action. The ineffectiveness of the preventive measures in preventing recurrence of non-compliance will be discussed with plant management in weekly meeting held this week. I also notified establishment management that continued failure to meet regulatory requirements could result in further enforcement actions.

11. SIGNATURE OF INSPECTION PROGRAM EMPLOYEE	15. DATE
Katherine Paz	11-19-03

FSIS FORM 5400-4 (7/98) Replaces FSIS Form 5400-4 (9/97), which may be used until exhausted (7/98)

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Berry Packing, Inc.
Crossett, AR

On Wednesday 11/19/03 at approximately 6:25am, we were notified of inhumane slaughter procedures. We were notified that a large hog required 4 shots with the captive bolt gun to properly kill it. The killing procedure was stopped by FSIS officials. For an immediate corrective action, we stopped using the captive bolt gun and started using an electric stunner. Our preventative measure will be for any animal which has been knocked twice with the captive bolt gun and is still conscious; we will then use a live fire weapon to kill the animal. Before our next use of the captive bolt gun, we will disassemble it to make sure all parts are functioning properly. We will also clean the gun and check the firing of it on a plastic barrel to make sure it is working properly. We will at least monthly inspect and clean all parts of the captive bolt gun to ensure proper operation. This will be monitored on a SPS monitoring form. Also, Brad Davis will retrain all kill floor employees on the proper stunning method and techniques on Friday, 11/21/03.

000059Jason Boyd
Est. 02325

s.(b)(6)
s.(b)(7)(C)

...nis information is Voluntary. It is needed to monitor defects found in this inspection system. ... is used by ... is determined ... 9CFR 301 and 9CFR 381. FORM APPR ...ED OMB NO. 0583-0089. OMB DISCLOSURE STATEMENT: Public reporting burden for this collection of information is ... average 7 minutes per response, includi... e time for reviewing instructions, searching existing data so ... gathering and maintaining the data needed, and ... pleting and reviewing the collection of information. Send comments regarding this burden estimate or any other as... of this collection of information, including suggestions for reducing this burden, to Department of Agriculture, Clearance Officer, OIRM, Room 404-W, Washington, D.C. 20250; and to the Office of Information and Regulatory Affairs, Office of Management and Budget.

U.S. DEPARTMENT OF AGRICULTURE
FOOD SAFETY AND INSPECTION SERVICE

NONCOMPLIANCE RECORD

TYPE OF NONCOMPLIANCE: ☐ Food Safety ☒ Other Consumer Protection

1. DATE	2. RECORD NO.	3. ESTABLISHMENT NO.
11/20/03	147-2003-1043	02325 M / 1

4. TO (*Name and Title*)	5. PERSONNEL NOTIFIED
Brad Davis, President/GM	Brad Davis

6. RELEVANT REGULATION(S)
313.30(A) (1)(4)

7. RELEVANT SECTION/PAGE OF ESTABLISHMENT PROCEDURE/PLAN	HACCP	SSOP	OTHER
			N/A

8. ISP CODE 04C02

9. NONCOMPLIANCE CLASSIFICATION INDICATORS

PLANT PROCESS	A. ☐ SSOP	☐ Monitoring	☐ Corrective Action	☐ Recordkeeping	☐ Implementation
	B. ☐ HACCP	☐ Monitoring	☐ Corrective Action	☐ Recordkeeping	☐ Plant Verification
C.	☒ PRODUCT	☐ Economic	☐ Misbranding	☒ Protocol	
D.	☐ FACILITY	☐ Lighting	☐ Structural	☐ Outside Premises	☐ Product Based
E.	☐ E. COLI	☐ Other			

10. DESCRIPTION OF NONCOMPLIANCE:

At approximately 7:35 AM while watching a employee stunning hog with a commercial electrical stunner. I observed a hog lifting the front half of his body up and making grunting noises. I went and got the IIC [redacted] and we both observed the next one stunned and stuck this hog also lifted the front half of his body and grunted. I tagged the stunning booth with tag # B38327071. And when I received a verbal corrective and preventive action. Then removed tag at approximately 8:05 AM. I notified Brad Davis and [redacted] of the non-compliance. This is a failure to comply with FSIS regulation 313.30 which states, "The electric current shall be administered so as to produce, at a

11. SIGNATURE OF INSPECT[redacted]

You are hereby advised of your r[redacted] of 9 CFR.

12. PLANT MANAGEMENT R[redacted]

See Attached

13. PLANT MANAGEMENT RESPONSE *(further planned actions(s))*:

This document serves as written notification that your failure to comply with regulatory requirement(s) could result in additional regulatory or administrative action.

14. SIGNATURE OF PLANT MANAGEMENT	15. DATE
[redacted]	11/20/03
16. [redacted]EE	17. DATE 11/20/03

FSIS [redacted] 00-4 (9/97), which may be used until exhausted.(7/98)

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U.S. DEPARTMENT OF AGRICULTURE
FOOD SAFETY AND INSPECTION SERVICE

NONCOMPLIANCE RECORD CONTINUATION SHEET

TYPE OF NONCOMPLIANCE: ☐ Food Safety ☒ Other Consumer Protection

1. DATE	2. RECORD NO.	3. ESTABLISHMENT NO.
11/20/03	147-2003-1043	02325 M / 1

4. TO (*Name and Title*)	5. PERSONNEL NOTIFIED
Brad Davis, President/GM	Brad Davis

6. RELEVANT REGULATION(S)
313.30(A) (1)(4)

7. RELEVANT SECTION/PAGE OF ESTABLISHMENT PROCEDURE/PLAN	HACCP	SSOP	OTHER
			N/A

8. ISP CODE	9. NONCOMPLIANCE INDICATOR
04C02	Product Protocol

10. DESCRIPTION OF NONCOMPLIANCE:

minimum, surgical anesthesia, i.e. a state where the animals shall be either stunned or killed before they are shackled, hoisted, thrown, cast, or cut. They shall be exposed to the electric current in a way that will accomplish the desired result quickly and effectively, with a minimum of excitement and discomfort," and FSIS regulation 313.30(A)(4) which states, "The stunned animal shall remain in a state of surgical anesthesia through shackling, sticking, and bleeding. Continued failure to meet these regulatory requirements could result in additional regulatory or administrative action. The ineffectiveness of preventive measures in preventing recurrence of noncompliance was discussed with plant management in the weekly meeting held this week on 11/19/03. I also notified establishment management that continued failure to meet regulatory requirements could result in further enforcement actions.

Past Similar NRs - Previous Ineffective Plant Actions: Retraining employees and checking equipment.

NR: 145-2003 dated 11/19/03

11. SIGNATURE OF INSPECTION [redacted]

15. DATE 11-20-03

FSIS FORM 5400-4 (7/98) [redacted] ed until

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Berry Packing, Inc.
Crossett, AR

On Thursday 11/20/03 at approximately 7:35am, we were notified of inhumane slaughter procedures. We were notified that two hogs were not stunned properly and started regaining consciousness and were moving vigorously and making noise. The killing procedure was stopped and Brad Davis and I were notified. Our immediate corrective action is that we will use the captive bolt gun to kill for the rest of the day. Our preventive measure is that we will have both electric stunners serviced by our electrician before they are put back into use. Brad Davis or [redacted] will make sure proper killing procedure is used when using electricity to stun livestock.

000062 [redacted]
Est. 02325

s.(b)(6)
s.(b)(7)(C)

U.S. DEPARTMENT OF AGRICULTURE
FOOD SAFETY AND INSPECTION SERVICE

NONCOMPLIANCE RECORD

TYPE OF NONCOMPLIANCE: ☐ Food Safety ☒ Other Consumer Protection

1. DATE	2. RECORD NO.	3. ESTABLISHMENT NO.
11/21/03	149-2003-1043	02325 M / 1

4. TO (*Name and Title*)	5. PERSONNEL NOTIFIED
Brad Davis, President/GM	Brad Davis

6. RELEVANT REGULATION(S)
313.1(b) 313.2(e)

7. RELEVANT SECTION/PAGE OF ESTABLISHMENT PROCEDURE/PLAN	HACCP	SSOP	OTHER
			N/A

8. ISP CODE 04C02

9. NONCOMPLIANCE CLASSIFICATION INDICATORS

PLANT PROCESS	A. ☐ SSOP	☐ Monitoring	☐ Corrective Action	☐ Recordkeeping	☐ Implementation
	B. ☐ HACCP	☐ Monitoring	☐ Corrective Action	☐ Recordkeeping	☐ Plant Verification
C.	☒ PRODUCT	☐ Economic	☐ Misbranding	☒ Protocol	
D.	☐ FACILITY	☐ Lighting	☐ Structural	☐ Outside Premises	☐ Product Based
E.	☐ E. COLI	☐ Other			

10. DESCRIPTION OF NONCOMPLIANCE:

At approximately 6:05 AM while performing ante-mortem inspection on the outside of the pens. I observed five heifer in a live holding pen. When a plant employee and myself walked by the pen one of the heifer slipped on the smooth concrete surface and lost it's footing and fell to the floor on its side and fell into two other heifers and they fell to their knees. This incident was observed by myself, IIC [redacted] and [redacted] QA Manager. Continued ante-mortem on the other animals and I observed three swine that weighed approximately [redacted] pounds a piece over crowed in a 3 foot by 8 foot pen without water, five sows in another pen without water. Informed Jason Boyd of the

11. SIGNATURE OF IN[redacted]

You are hereby advised of your right to appeal this decision as delineated by 306.5 and/or 381.35 of 9 CFR

12. PLANT MANAGEMENT RESPONSE *(Immediate actions(s))*:

See Attached

13. PLANT MANAGEMENT RESPONSE *(further planned actions(s))*:

This document serves as written notification that your failure to comply with regulatory requirement(s) could result in additional regulatory or administrative action.

14. SIGNATURE OF PLANT MANAGEMENT [redacted]

15. DATE 11/26/03

17. DATE 11/26/03

FSIS Form 5400-4 (7/98) Replaces FSIS Form 5400-4 (2/97), which may be used until exhausted.(7/98)

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FOOD SAFETY AND INSPECTION SERVICE

NONCOMPLIANCE RECORD CONTINUATION SHEET

TYPE OF NONCOMPLIANCE: ☐ Food Safety ☒ Other Consumer Protection

1. DATE	2. RECORD NO.	3. ESTABLISHMENT NO.
11/21/03	149-2003-1043	02325 M / 1

4. TO (*Name and Title*)	5. PERSONNEL NOTIFIED
Brad Davis, President/GM	Brad Davis

6. RELEVANT REGULATION(S)
313.1(b) 313.2(e)

7. RELEVANT SECTION/PAGE OF ESTABLISHMENT PROCEDURE/PLAN	HACCP	SSOP	OTHER
			N/A

8. ISP CODE	9. NONCOMPLIANCE INDICATOR
04C02	Product Protocol

10. DESCRIPTION OF NONCOMPLIANCE:

noncompliance of reg. 313.1(b) which states, " Floors of livestock pens, ramps and driveways shall be constructed and maintained so as to provide good footing for livestock. Slip resistant or waffled floor surfaces, cleated ramps and the use of sand, as appropriate, during winter months are examples of acceptable construction and maintenance. Reg. 313. 2 (e) which states, " Animals shall have access to water in all holding pens and if held longer than 24 hours, access to feed. There shall be sufficient room in the holding pen for animals held overnight to lie down.

At approximately 11:50 hours IIC [redacted] and myself observed three swine over crowed in a 3 foot by 8 foot pen without water. Immediately informed [redacted] he kill floor supervisor of the noncompliance. Swine were removed from the pen and water was supplied inthe new pen.
Continued failure to meet these regulatory requirements can lead to the enforcement actions described in 9 CFR 500. 3(b) which states, "FSIS may impose a suspension without providing the establishment prior notification because the establishment is handling or slaughtering animals inhumanely". The ineffectiveness of the further plan actions in preventing recurrence of noncompliance was discussed with plant management on 11/19/03 and 11/21/03.

11. SIGNATURE OF INSPECTION PROGRAM EMPLOYEE	15. DATE
[redacted]	11-21-03

FS exhausted.(7/98) TRIBUTION: Original & 1 copy - Establishment 1 copy - Inspector

Berry Packing Inc.
Crossett, AR

November 21, 2003

I understand the agency concern for cattle slipping in the pens. I have contacted two separate concrete contractors to help us make the best informed decision on how to handle this problem. I don't want to cause two problems by hastily trying to fix one problem. I realize that there are some temporary measures which can be taken to better promote animal safety. If any more cattle are scheduled to come in we will place and adequate amount of sand in the pens to make sure the livestock are able to maintain a secure footing. We will try out best to avoid purposely harming any livestock. Thank you for your consideration in this matter. We will give you in writing by Wednesday, November 26, 2003, what our permanent solution to this problem will be.

Sincerely,

Brad Davis
Owner/ Manager
Est. 02325

s.(b)(6)
s.(b)(7)(C)

...st for this information is Voluntary. It is nec... monitor defects found in this inspection system. It is used ... SIS to determine whether establishments ... co... 9CFR 301 and 9CFR 381. FORM APPR... D OMB NO. 0583-0089. OMB DISCLOSURE STATEMENT ...blic reporting burden for this collection of information is es... average 7 minutes per response, including the time for reviewing instructions, searching existing data soures, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, inluding suggestions for reducing this burden, to Department of Agriculture, Clearance Officer, OIRM, Room 404-W, Washington, D.C. 20250; and to the Office of Information and Regulatory Affairs, Office of Management and Budget.

U.S. DEPARTMENT OF AGRICULTURE
FOOD SAFETY AND INSPECTION SERVICE

NONCOMPLIANCE RECORD

TYPE OF NONCOMPLIANCE: [ ] Food Safety [X] Other Consumer Protection

1. DATE	2. RECORD NO.	3. ESTABLISHMENT NO.
11/24/03	153-2003-1043	02325 M / 1

4. TO (*Name and Title*): Brad Davis, President/GM

5. PERSONNEL NOTIFIED: Brad Davis

6. RELEVANT REGULATION(S): 313.30(a)(4) 313.1(a) 500.3(b)

7. RELEVANT SECTION/PAGE OF ESTABLISHMENT PROCEDURE/PLAN	HACCP	SSOP	OTHER
			N/A

8. ISP CODE: 04C02

9. NONCOMPLIANCE CLASSIFICATION INDICATORS

PLANT PROCESS A. [ ] SSOP	[ ] Monitoring	[ ] Corrective Action	[ ] Recordkeeping	[ ] Implementation
PLANT PROCESS B. [ ] HACCP	[ ] Monitoring	[ ] Corrective Action	[ ] Recordkeeping	[ ] Plant Verification
C. [X] PRODUCT	[ ] Economic	[ ] Misbranding	[X] Protocol	
D. [ ] FACILITY	[ ] Lighting	[ ] Structural	[ ] Outside Premises	[ ] Product Based
E. [ ] E. COLI	[ ] Other			

10. DESCRIPTION OF NONCOMPLIANCE:

At approximately 9:32 AM while on the kill floor waiting for the next hog to be ready for me to inspect. I observed a employee that was stunning the animals had stunned with the electric stunner and stated hoisting the hog, it kicked out of the chain. Then the employee used a captive bolt to stun the hog and that worked. Between the first hog that was stunned and the last two hogs being stunned I asked the IIC [redacted] to verify the stunning was being done inhumanely. Then they stunned two more hogs with the electric stunner and started to hoist them and they kicked out of the chain then they used the captive bolt on them also. Placed reject tag # B38 327072 on the stunning booth. I

11. SIGNATURE OF INSPE[redacted]

You are hereby advised of yo[redacted]

12. PLANT MANAGEMENT RESPONSE *(immediate actions(s))*:

13. PLANT MANAGEMENT RESPONSE *(further planned actions(s))*:

This document serves as written notification that your failure to comply with regulatory requirement(s) could result in additional regulatory or administrative action.

14. SIGNATURE OF PLANT MANAGEMENT

15. DATE: 11/24/03

[redacted] OYEE

17. DATE: 11/24/03

5400-4 (9/97), which may be used until exhausted.(7/98)

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s.(b)(6)
s.(b)(7)(C)

U.S. DEPARTMENT OF AGRICULTURE
FOOD SAFETY AND INSPECTION SERVICE

NONCOMPLIANCE RECORD CONTINUATION SHEET

TYPE OF NONCOMPLIANCE: [ ] Food Safety [X] Other Consumer Protection

1. DATE	2. RECORD NO.	3. ESTABLISHMENT NO.
11/24/03	153-2003-1043	02325 M / 1

4. TO (*Name and Title*)	5. PERSONNEL NOTIFIED
Brad Davis, President/GM	Brad Davis

6. RELEVANT REGULATION(S)
313.30(a)(4) 313.1(a) 500.3(b)

7. RELEVANT SECTION/PAGE OF ESTABLISHMENT PROCEDURE/PLAN	HACCP	SSOP	OTHER
			N/A

8. ISP CODE	9. NONCOMPLIANCE INDICATOR
04C02	Product Protocol

10. DESCRIPTION OF NONCOMPLIANCE:

notified Mr. Brad Davis the plant manger of the non-compliance to comply with FSIS regulation 313.30(a)(4) which states(The stunned animal shall remain in state of surgical anesthesia through shackling, sticking, and bleed.

And there has been burns on the hips of the hogs. I investigated further and discovered there wasa steam pipe inside the holding pen that was getting hot and burning the hogs. Placed reject tag # B38 327079 on the holding pen. Mr. Brad Davis was notified of the failure to comply with FSIS regulation 313.1(a) which states (Livestock pens, driveways and ramps shall be maintained in good repair. They shall be free from sharp or protruding objects which may, in the opinion of the inspector, cause injury or pain to the animals.

Similar noncompliance was documented on NR # 147-03 dated 11/20/03. The further plan action of "We will have both electric stunners serviced by our electrician before they are put back in use. Brad Davis or [redacted] will make sure proper killing procedure is used when using electricity to stun livestock" were not implemented or were ineffective in preventing recurrence of the noncompliance. Continued failure to meet these regulatory requirements can lead to the enforcement actions described in 9 CFR 500.3(b) which states, " FSIS may impose a suspension without providing the establishment prior notification because the establishment is handling or slaughtering animals inhumanely. " The ineffectiveness of the further plan actions in preventing recurrence of noncompliance was discussed with plant management on 11/19/03, 11/21/03 and 11/24/03.

After receiving immediate corrective actions and further plan actions in writing, I released the stunning booth at approximately 10:15 AM

11. SIGNATURE OF INSP[redacted]	15. DATE
	11-24-03

FSIS FORM 5400-4 (7/98) may be used until DISTRIBUTION: Original & 1 copy - Establishmen
1 copy - Inspector

Berry Packing, Inc.
Crossett, AR

On Tuesday 11/24/03 at approximately 9:32am, we were notified of inhumane slaughter procedures. We were notified that a hog was stunned and then chained. While it was being lifted it kicked free from the chain. At this point, it was knocked with the captive bolt gun. Then a second hog was stunned and raised. While being raised the chain slipped and the animal was lowered and knocked with the captive bolt gun. For our corrective action we will use the captive bolt gun for the rest of the day. To prevent this from happening again, we will not use the electric stunner until it is verified to be working properly by a certified electrician or replaced.

 s.(b)(6) s.(b)(7)(C)

U.S. DEPARTMENT OF AGRICULTURE
FOOD SAFETY AND INSPECTION SERVICE

NONCOMPLIANCE RECORD

TYPE OF NONCOMPLIANCE: ☐ Food Safety ☒ Other Consumer Protection

1. DATE	2. RECORD NO.	3. ESTABLISHMENT NO.
12/30/03	76-2003-1147	06544A M / I

4. TO (*Name and Title*): Mr. Jim McConnell, Plant Manager

5. PERSONNEL NOTIFIED: Mr. Jim McConnell

6. RELEVANT REGULATION(S): 313.15(a)(1)

7. RELEVANT SECTION/PAGE OF ESTABLISHMENT PROCEDURE/PLAN | HACCP | SSOP | OTHER: Humane Handling

8. ISP CODE: 04C02

9. NONCOMPLIANCE CLASSIFICATION INDICATORS

PLANT PROCESS	A. ☐ SSOP	☐ Monitoring	☐ Corrective Action	☐ Recordkeeping	☐ Implementation	
	B. ☐ HACCP	☐ Monitoring	☐ Corrective Action	☐ Recordkeeping	☐ Hazard Verification	
C.	☒ PRODUCT	☐ Economic	☐ Mislabeling	☒ Pathogen		
D.	☐ FACILITY	☐ Lighting	☐ Structural	☐ Outside Premises	☐ Product Dated	
E.	☐ E. COLI	☐ Other				

10. DESCRIPTION OF NONCOMPLIANCE:

At 0630, 30 December 2003, while performing ante-mortem and humane handling procedures in the receiving area of the hog pens a sow was presented non-ambulatory caused by split-out condition. Examination showed the sow fit for slaughter. The captive bolt used to stun the sow was not in good repair or operating condition. Unconsciousness was not established with the first stun and had to be followed by another stun. In accordance with 313.15(a) (1), the captive bolt stunners shall be applied to the livestock in accordance with the section so as to produce immediate unconsciousness...

[redacted] 9 CFR

12. PLANT MANAGEMENT RESPONSE (*Immediate actions(s)*):

See attached

13. PLANT MANAGEMENT RESPONSE (*further planned actions(s)*):

See attached

This document serves as written notification that your failure to comply with regulatory requirement(s) could result in additional regulatory or administrative action.

14. SIGNATURE OF PLANT MANAGEMENT: Craig Adam | 15. DATE: 1/06/04

[redacted] SIGNATURE OF INSPECTION PROGRAM PERSONNEL | 17. DATE

[redacted] Form 9540-1 (9/97), which may be used until exhausted (7/08)

DISTRIBUTION: Original & 1 copy - Establishment 1 copy - Inspector

U.S. DEPARTMENT OF AGRICULTURE
FOOD SAFETY AND INSPECTION SERVICE

NONCOMPLIANCE RECORD CONTINUATION SHEET

TYPE OF NONCOMPLIANCE
☐ Food Safety ☒ Other Consumer Protection

1. DATE	2. RECORD NO.	3. ESTABLISHMENT NO.
12/30/03	76-2003-1147	06544A M / I

4. TO (Name and Title)	5. PERSONNEL NOTIFIED
Mr. Jim McConnell, Plant Manager	Mr. Jim McConnell

6. RELEVANT REGULATION(S)
313.15(a)(1)

7. RELEVANT SECTION/PAGE OF ESTABLISHMENT PROCEDURE/PLAN	HACCP	SSOP	OTHER
			Humane Handling

8. ISP CODE	9. NONCOMPLIANCE INDICATOR
04C02	Product Protocol

10. DESCRIPTION OF NONCOMPLIANCE:

Failure to comply with regulatory requirements as set forth in Reg. 313.15(a)(1) will result in further regulatory/administrative actions.

11. SIGNATURE OF INSPECTION PROGRAM EMPLOYEE	12. DATE
[redacted]	12-30-03

FSIS FORM 5400-4 (7/98) Replaces FSIS Form 5400-4 (9/97), which may be used until exhausted.(7/98)

DISTRIBUTION: Original & 1 copy - Establishment
1 copy - Inspector

s.(b)(6)
s.(b)(7)(C)

RESPONSE TO NR-76-2003-1147

Immediate action:

The captive bolt stunner was taken to maintenance to be cleaned and repaired.

Further planned action:

- Preventive maintenance procedures for the captive bolt stunner were put into place.
- Two new captive bolt stunners were ordered.
- New firing caps for the stunner were ordered also.

Craig Adams

s.(b)(6)
s.(b)(7)(C)

U.S. DEPARTMENT OF AGRICULTURE
FOOD SAFETY AND INSPECTION SERVICE

NONCOMPLIANCE RECORD

TYPE OF NONCOMPLIANCE: ☐ Food Safety ☒ Other Consumer Protection

1. DATE	2. RECORD NO.	3. ESTABLISHMENT NO.
1/12/04	4-2004-1147	06544A M / 1

4. TO (Name and Title)	5. PERSONNEL NOTIFIED
Mr. Jim McConnell, Plant Manager	Mr. Jim McConnell

6. RELEVANT REGULATION(S)
313.15(a)(1)

7. RELEVANT SECTION/PAGE OF ESTABLISHMENT PROCEDURE/PLAN	HACCP	SSOP	OTHER
			Humane Handling

8. ESP CODE 04C02

9. NONCOMPLIANCE CLASSIFICATION INDICATORS

PLANT PROCESS	A. ☐ SSOP	☐ Monitoring	☐ Corrective Action	☐ Recordkeeping	☐ Implementation	
	B. ☐ HACCP	☐ Monitoring	☐ Corrective Action	☐ Recordkeeping	☐ Plant Verification	
C.	☒ PRODUCT	☐ Economic	☐ Misbranding	☒ Protocol		
D.	☐ FACILITY	☐ Lighting	☐ Sanitation	☐ Outside Premises	☐ Product Breed	
E.	☐ E. COLI	☐ Other				

10. DESCRIPTION OF NONCOMPLIANCE:

At 0710, 12 January 2004, while performing ante-mortem and humane handling procedures in the receiving area of the hog pens a sow was presented non-ambulatory due to an injured right back leg. Examination showed the sow fit for slaughter. The captive bolt used to stun the sow was not in good repair or operating condition. Unconsciousness was not established with the first stun and had to be followed by another stun. In accordance with 313.15(a)(1), the captive bolt stunners shall be applied to the livestock in accordance with the section so as to produce immediate unconsciousness...

11. SIGNATURE OF INSPECTION [redacted] EMPLOYEE

You are hereby advised of your right to appeal this decision as delineated by 306.5 and/or 381.35 of 9 CFR

12. PLANT MANAGEMENT RESPONSE *(Immediate action(s))*:

See attached

13. PLANT MANAGEMENT RESPONSE *(further planned action(s))*:

See attached

This document serves as written notification that your failure to comply with regulatory requirement(s) could result in additional regulatory or administrative action.

14. SIGNATURE OF PLANT MANAGEMENT Craig Adam — 15. DATE 1/16/04

16. VERIFICATION SIGNATURE OF INSPECTION PROGRAM EMPLOYEE [redacted] — 17. DATE 1-19-04

FSIS FORM 5400-4 (7/98) Replaces FSIS Form 5400-4 (6/97), which may be used until exhausted. (7/98)

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s.(b)(6)
s.(b)(7)(C)

U.S. DEPARTMENT OF AGRICULTURE
FOOD SAFETY AND INSPECTION SERVICE

NONCOMPLIANCE RECORD CONTINUATION SHEET

TYPE OF NONCOMPLIANCE
☐ Food Safety ☒ Other Consumer Protection

1. DATE	2. RECORD NO.	3. ESTABLISHMENT NO.
1/12/04	4-2004-1147	06544A M / 1

4. TO (*Name and Title*)	5. PERSONNEL NOTIFIED
Mr. Jim McConnell, Plant Manager	Mr. Jim McConnell

6. RELEVANT REGULATION(S)
313.15(a)(1)

7. RELEVANT SECTION/PAGE OF ESTABLISHMENT PROCEDURE/PLAN	HACCP	SSOP	OTHER
			Humane Handling

8. INSP CODE	9. NONCOMPLIANCE INDICATOR
04C02	Product Protocol

10. DESCRIPTION OF NONCOMPLIANCE:

This is a repeat of NR 76-2003-1147, dated 12/30/03
Failure to comply with regulatory requirements as set forth in Reg. 313.15(a)(1) will result in further regulatory/administrative actions.

11. SIGNATURE OF INSPECTION PROGRAM EMPLOYEE	15. DATE
[redacted]	1-12-04

FSIS FORM 5400-4 (7/98) Replaces FSIS Form 5400-4 (9/97), which may be used until exhausted (7/98) DISTRIBUTION: Original & 1 copy - Establishment 1 copy - Inspector

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s.(b)(7)(C)

RESPONSE TO NR-04-2004-1147

Immediate action:

After an investigation it was determined that the firing caps had absorbed moisture, which reduced there firing power.

Further planned action:

- The firing caps in the pen office were thrown away.
- An airtight container was purchased to hold the firing caps.
- Two new captive bolt stunners were received 1/13/04 and put into service.

Craig Adam

s.(b)(6)
s.(b)(7)(C)

The request for this information is voluntary. It is needed to monitor defects found in this inspection system. It is used by FSIS to determine whether establishments are in compliance 9CFR 301 and 9CFR 381. FORM APPROVED OMB NO. 0583-0089. OMB DISCLOSURE STATEMENT: Public reporting burden for this collection of information is estimated to average 7 minutes per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Department of Agriculture, Clearance Officer, OIRM, Room 404-W, Washington, D.C. 20250; and to the Office of Information and Regulatory Affairs, Office of Management and Budget.

U.S. DEPARTMENT OF AGRICULTURE
FOOD SAFETY AND INSPECTION SERVICE

NONCOMPLIANCE RECORD

TYPE OF NONCOMPLIANCE: ☐ Food Safety ☒ Other Consumer Protection

1. DATE	2. RECORD NO.	3. ESTABLISHMENT NO.
4/22/04	23-2004-1147	06544A M / 1

4. TO (*Name and Title*)	5. PERSONNEL NOTIFIED
Mr. Jim McConnell, Plant Manager	Mr. Jim McConnell

6. RELEVANT REGULATION(S): 313.15(a)(1)

7. RELEVANT SECTION/PAGE OF ESTABLISHMENT PROCEDURE/PLAN	HACCP	SSOP	OTHER

8. ISP CODE: 04C02

9. NONCOMPLIANCE CLASSIFICATION INDICATORS

PLANT PROCESS						
	A. ☐ SSOP	☐ Monitoring	☐ Corrective Action	☐ Recordkeeping	☐ Implementation
	B. ☐ HACCP	☐ Monitoring	☐ Corrective Action	☐ Recordkeeping	☐ Plant Verification
C.	☒ PRODUCT	☐ Economic	☐ Misbranding	☒ Protocol	
D.	☐ FACILITY	☐ Lighting	☐ Structural	☐ Outside Premises	☐ Product Dated
E.	☐ E. COLI	☐ Other			

10. DESCRIPTION OF NONCOMPLIANCE:

At 1000, 22 April 2004, while performing Ante-mortem and humane handling procedures in the receiving area of the hog pens a sow was presented non-ambulatory. Examination revealed the sow to be in a moribund condition and unfit for slaughter. The captive bolt used to stun the sow did not establish unconsciousness on the first shot. A second captive bolt was obtained and a second shot did not establish unconsciousness. The third shot did render the sow unconscious. This document serves as written notification that your failure to comply with regulatory requirement(s) could result in additional regulatory or administrative action.

11. SIGNATURE OF INSPECTION PROGRAM EM[redacted]

You are hereby advised of your right to appeal this decision as delineated by 306.5 and/or 381.35 of 9 CFR.

12. PLANT MANAGEMENT RESPONSE *(Immediate action(s))*:

13. PLANT MANAGEMENT RESPONSE *(further planned action(s))*:

This document serves as written notification that your failure to comply with regulatory requirement(s) could result in additional regulatory or administrative action.

14. SIGNATURE OF PLANT MANAGEMENT: [redacted] Russell

15. DATE: 4/29/04

16. VERIFICATION SIGNATURE O[redacted]

17. DATE: 04/30/04

FSIS FORM 5400-4 (7/98) Replaces FSIS Form 5400-4 (9/97), which may be used until exhausted (7/98)

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s.(b)(6)
s.(b)(7)(C)

4/30/2004

RESPONSE TO NR 23-2004-1147

Immediate Actions:

The sow was finally rendered unconscious on third stun.

Further planned Action:

The electric stunner that uses a generator will be used starting 4/23/04.

Regina Russell 4/29/04

Regina Russell

U.S. DEPARTMENT OF AGRICULTURE
FOOD SAFETY AND INSPECTION SERVICE

NONCOMPLIANCE RECORD

TYPE OF NONCOMPLIANCE: [ ] Food Safety [X] Other Consumer Protection

1. DATE	2. RECORD NO.	3. ESTABLISHMENT NO.
5/11/04	28-2004-2097	06544A M / 1

4. TO (*Name and Title*): Mr. Jim McConnell, Plant Manager

5. PERSONNEL NOTIFIED: Mr. Jim McConnell

6. RELEVANT REGULATION(S): 313.2(a)

7. RELEVANT SECTION/PAGE OF ESTABLISHMENT PROCEDURE/PLAN	HACCP	SSOP	OTHER

8. ISP CODE: 04C02

9. NONCOMPLIANCE CLASSIFICATION INDICATORS

PLANT PROCESS	A. [ ] SSOP	[ ] Monitoring	[ ] Corrective Action	[ ] Recordkeeping	[ ] Implementation	
	B. [ ] HACCP	[ ] Monitoring	[ ] Corrective Action	[ ] Recordkeeping	[ ] Plant Verification	
C.	[X] PRODUCT	[ ] Economic	[ ] Mislabeling	[X] Protocol		
D.	[ ] FACILITY	[ ] Lighting	[ ] Structural	[ ] Outside Premises	[ ] Product Based	
E.	[ ] E. COLI	[ ] Other				

10. DESCRIPTION OF NONCOMPLIANCE:

At 0820 I was standing alongside of the unloading ramp in the hog pen area to do antemortem inspection on a load of hogs from [redacted] (Driver: [redacted] Assistant: [redacted]. I observed that Plant Employee [redacted] was on the hog pen side of the door at the bottom of the ramp. The door at the bottom of the ramp was closed and [redacted] was at the top of the ramp at the area of the door on the rear of the trailer. I observed [redacted] motion to [redacted] asking if [redacted] could start unloading and [redacted] responsed by holding up [redacted] hand and arm in a stop or do not proceed motion. As [redacted] turned to get the hog pen that [redacted] wanted to use ready to receive the hogs, I observed 6 to

11. SIGNATURE OF INSPECTION PROGRAM EMPLOYEE: [redacted]

You are hereby advised of your right to appeal this decision as delineated by 306.5 and/or 381.35 of 9 CFR.

12. PLANT MANAGEMENT RESPONSE *(Immediate actions(s))*:

13. PLANT MANAGEMENT RESPONSE *(further planned actions(s))*:

This document serves as written notification that your failure to comply with regulatory requirement(s) could result in additional regulatory or administrative action.

14. SIGNATURE OF PLANT MANAGEMENT: [redacted]

15. DATE: 5/11/04

16. VERIFICATION SIGNATURE OF INSPECTION PROGRAM EMPLOYEE: [redacted]

17. DATE: 05/09/04

FSIS FORM 5400-4 (7/98) Replaces FSIS Form 5400-4 (2/97) which may be used until exhausted.(7/98)

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s.(b)(6)
s.(b)(7)(C)

U.S. DEPARTMENT OF AGRICULTURE
FOOD SAFETY AND INSPECTION SERVICE

NONCOMPLIANCE RECORD CONTINUATION SHEET

TYPE OF NONCOMPLIANCE
☐ Food Safety ☒ Other Consumer Protection

1. DATE	2. RECORD NO.	3. ESTABLISHMENT NO.
5/11/04	28-2004-2097	06544A M / I

4. TO (Name and Title)	5. PERSONNEL NOTIFIED
Mr. Jim McConnell, Plant Manager	Mr. Jim McConnell

6. RELEVANT REGULATION(S)
313.2(a)

7. RELEVANT SECTION/PAGE OF ESTABLISHMENT PROCEDURE/PLAN	HACCP	SSOP	OTHER

8. ISP CODE	9. NONCOMPLIANCE INDICATOR
04C02	Product Protocol

10. DESCRIPTION OF NONCOMPLIANCE:

8 hogs start down the ramp with the gate at the bottom of the ramp still closed and barred. When the hogs arrived at the bottom of the ramp they panicked looking for an escape and went into an excited screaming attitude and attempted to go over the closed gate. One of the hogs almost made it over the closed gate while standing on top of one of the other hogs. Several of the hogs were knocked to the floor in the frenzy. When the hogs finally settled down to where [redacted] could open the gate one hog was still on the floor and was trampled by the other hogs as they exited the ramp and actually rolled her over in the process.
I immediately stopped everything until it could be communicated to [redacted] that this was a serious noncompliance with humane handling regulations.
[redacted] (a plant supervisor) was notified and took immediate control. [redacted] admitted that it may have been [redacted] that released the hogs as [redacted] was outside along side of the trailer and could not see [redacted] motion to not start unloading.

This document serves as written notification that your failure to comply with regulatory requirement(s) could result in additional regulatory or administrative action.

11. SIGNATURE OF INSPECTION PROGRAM E[redacted] 12. DATE 05/11/04

FSIS 8080-4 (7/98) Replaces FSIS Form 8400-4 (9/97), which may be used until exhausted (7/98) DISTRIBUTION: Original & 1 copy - Establishment 1 copy - Inspector

 s.(b)(7)(C) s.(b)(6)

RESPONSE TO NR 28-2004-1147

Immediate Actions:

The gate was open and hogs were released into a pen.

Further planned Action:

All drivers and assistance drivers are required to understand and apply Humane Handling practices from the farm until the plant.

Regina Russell

Regina Russell 7/1/14

s.(b)(6)
s.(b)(7)(C)

U.S. DEPARTMENT OF AGRICULTURE
FOOD SAFETY AND INSPECTION SERVICE

NONCOMPLIANCE RECORD

TYPE OF NONCOMPLIANCE: ☐ Food Safety ☒ Other Consumer Protect

1. DATE	2. RECORD NO.	3. ESTABLISHMENT NO.
7/22/2004	47-2004-7726	06544A M / 1

4. TO (*Name and Title*): Mr. Jim McConnell, Plant Manager

5. PERSONNEL NOTIFIED: Mr. Jim McConnell

6. RELEVANT REGULATION(S): 313.15

7. RELEVANT SECTION/PAGE OF ESTABLISHMENT PROCEDURE/PLAN: HACCP | SSOP | OTHER

8. ISP CODE: 04C02

9. NONCOMPLIANCE CLASSIFICATION INDICATORS

PLANT PROCESS	A. ☐ SSOP	☐ Monitoring	☐ Corrective Action	☐ Recordkeeping	☐ Implementation	
	B. ☐ HACCP	☐ Monitoring	☐ Corrective Action	☐ Recordkeeping	☐ Plant Verification	
C.	☒ PRODUCT	☐ Economic	☐ Misbranding	☒ Protocol		
D.	☐ FACILITY	☐ Lighting	☐ Structural	☐ Outside Premises	☐ Product Based	
E.	☐ E. COLI	☐ Other				

10. DESCRIPTION OF NONCOMPLIANCE:

At 0700 while in the hog pen area I observed a hog in pen 4 being stunned with a captive bolt. After the initial stunning attempt the hog was still making purposeful movement with head and forelegs, and licking snout with tongue. The hog also had a temporary palpebral reflex. Paul Whitfield was immediately notified and both the captive bolt and caps were tagged with Retain Tag B34568055 as it appeared to be a malfunction of either the captive bolt or the caps.

11. SIGNATURE OF INSPECTION PROGRAM EMPLOYEE: [redacted]

You are hereby advised of your right to appeal this decision as delineated by 306.5 and/or 381.35 of 9 CFR.

12. PLANT MANAGEMENT RESPONSE (*Immediate action(s)*):

13. PLANT MANAGEMENT RESPONSE (*further planned action(s)*):

This document serves as written notification that your failure to comply with regulatory requirement(s) could result in additional regulatory or administrative action.

14. SIGNATURE OF PLANT MANAGEMENT: Deana Russell — 15. DATE: 10/4/04

16. VERIFICATION SIGNATURE OF INSPECTION [redacted] — 17. DATE: 10/05/04

FSIS FORM 5400-4 (7/98) — Replaces [illegible] may be used until exhausted. (7/96) — DISTRIBUTION: Original & 1 copy - Establishment, 1 copy - Inspector

U.S. DEPARTMENT OF AGRICULTURE FOOD SAFETY AND INSPECTION SERVICE **NONCOMPLIANCE RECORD CONTINUATION SHEET**		TYPE OF NONCOMPLIANCE ☐ Food Safety ☒ Other Consumer Protection
1. DATE 7/22/2004	2. RECORD NO. 47-2004-7726	3. ESTABLISHMENT NO. 06544A M / I
4. TO (*Name and Title*) Mr. Jim McConnell, Plant Manager		5. PERSONNEL NOTIFIED Mr. Jim McConnell
6. RELEVANT REGULATION(S) 313.15		
7. RELEVANT SECTION/PAGE OF ESTABLISHMENT PROCEDURE/PLAN	HACCP	SSOP / OTHER
8. ISP CODE 04C02		9. NONCOMPLIANCE INDICATOR Product Protocol

10. DESCRIPTION OF NONCOMPLIANCE:

This document serves as written notification that your failure to comply with regulatory requirement(s) could result in additional regulatory or administrative action.

11. SIGNATURE OF INSPECTION PROGR [redacted]	15. DATE 07/22/04

FSIS FORM 5400-4 (7/98) Replaces FSIS Form 5400-4 (9/97), which may be used until exhausted (7/98) DISTRIBUTION: Original & 1 copy - Establishment 1 copy - Inspector

s.(b)(6)
s.(b)(7)(C)

RESPONSE TO NR 47-2004-7726

Immediate Actions:

The hog was rendered unconscious.

Further planned Action:

The caps for the captive bolt are now being stored in sealed container.

000082

Regina Russell

s.(b)(6)
s.(b)(7)(C)

The request for this information is Voluntary. It is needed to monitor defects found in this inspection system. It is used by FSIS to determine whether establishments are in compliance. 9CFR 301 and 9CFR 381. FORM APPROVED OMB NO. 0583-0089. OMB DISCLOSURE STATEMENT: Public reporting burden for this collection of information is estimated to average 7 minutes per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Department of Agriculture, Clearance Officer, OIRM, Room 404-W, Washington, D.C. 20250; and to the Office of Information and Regulatory Affairs, Office of Management and Budget.

U.S. DEPARTMENT OF AGRICULTURE
FOOD SAFETY AND INSPECTION SERVICE

NONCOMPLIANCE RECORD

TYPE OF NONCOMPLIANCE: ☐ Food Safety ☒ Other Consumer Protecti

1. DATE	2. RECORD NO.	3. ESTABLISHMENT NO.
7/27/2004	48-2004-7726	06544A M / 1

4. TO (*Name and Title*): Mr. Jim McConnell, Plant Manager

5. PERSONNEL NOTIFIED: Mr. Jim McConnell

6. RELEVANT REGULATION(S): 313.15

7. RELEVANT SECTION/PAGE OF ESTABLISHMENT PROCEDURES/PLAN	HACCP	SSOP	OTHER

8. ISP CODE: 04C02

9. NONCOMPLIANCE CLASSIFICATION INDICATORS

PLANT PROCESS	A. ☐ SSOP	☐ Monitoring	☐ Corrective Action	☐ Recordkeeping	☐ Implementation	
	B. ☐ HACCP	☐ Monitoring	☐ Corrective Action	☐ Recordkeeping	☐ Plant Verification	
C.	☒ PRODUCT	☐ Economic	☐ Misbranding	☒ Protocol		
D.	☐ FACILITY	☐ Lighting	☐ Structural	☐ Outside Premises	☐ Product Dwell	
E.	☐ E. COLI	☐ Other				

10. DESCRIPTION OF NONCOMPLIANCE:

At 0638 while performing antemortem inspection in the hog pen area, I observed a hog on a truck being stunned using a captive bolt. The first shot from the captive bolt appeared to misfire and the hog vocalized and remained conscious. [redacted] obtained a new package of caps for the captive bolt and a second shot using the new caps rendered the hog unconscious instantly at 0647.
This document serves as written notification that your failure to comply with regulatory requirement(s) could result in additional regulatory or administrative action.

11. SIGNATURE OF INSPECTION PROC[redacted]

You are hereby advised of your right to appeal this decision as provided by 9 CFR Part 500 of 9 CFR.

12. PLANT MANAGEMENT RESPONSE (*Immediate action(s)*):

13. PLANT MANAGEMENT RESPONSE (*further planned action(s)*):

This document serves as written notification that your failure to comply with regulatory requirement(s) could result in additional regulatory or administrative action.

14. SIGNATURE OF PLANT MANAGEMENT: Keana Russell — 15. DATE: 7-29-09

16. VERIFICATION SIGNATURE OF INSPECTIC[redacted] — 17. DATE: 10/26/09

FSIS FORM 5400-4 (7/98) — Replaces FSIS Form 5400-4 (9/97), which may be used until exhausted (7/99) — DISTRIBUTION: Original & 1 copy - Establishment, 1 copy - Inspector

 s.(b)(6) s.(b)(7)(C)

RESPONSE TO NR 48-2004-7726

Immediate Actions:

The hog was rendered unconscious.

Further planned Action:

The caps for the captive bolt are now being stored in sealed container.

000084 *Regina Russell*

s.(b)(6)
s.(b)(7)(C)

U.S. DEPARTMENT OF AGRICULTURE
FOOD SAFETY AND INSPECTION SERVICE

NONCOMPLIANCE RECORD

TYPE OF NONCOMPLIANCE: ☐ Food Safety ☒ Other Consumer Protecti

1. DATE	2. RECORD NO.	3. ESTABLISHMENT NO.
11/29/2004	82-2004-7726	06544A M / 1

4. TO (*Name and Title*): Mr. Jim McConnell, Plant Manager

5. PERSONNEL NOTIFIED: Mr. Jim McConnell

6. RELEVANT REGULATION(S): 313.30(a)(4), 313.30(b)(3)

7. RELEVANT SECTION/PAGE OF ESTABLISHMENT PROCEDURE/PLAN	HACCP	SSOP	OTHER

8. ISP CODE: 04C02

9. NONCOMPLIANCE CLASSIFICATION INDICATORS

PLANT PROCESS	A. ☐ SSOP	☐ Monitoring	☐ Corrective Action	☐ Recordkeeping	☐ Implementation	
	B. ☐ HACCP	☐ Monitoring	☐ Corrective Action	☐ Recordkeeping	☐ Plant Verification	
C. ☒ PRODUCT		☐ Economic	☐ Misbranding	☒ Process		
D. ☐ FACILITY		☐ Lighting	☐ Structural	☐ Outside Premises	☐ Product Breed	
E. ☐ E. COLI		☐ Other				

10. DESCRIPTION OF NONCOMPLIANCE:

At 0615 at the base of the unloading ramp in the hog pen, I observed [redacted] (plant employee) stunning a downer hog with a portable generator and stunning equipment. After stunning, [redacted] stuck the hog which initiated the bleeding process. During the bleeding I observed the hog blink. On closer examination I observed purposeful movement of the hog's tongue and a palpebral reflex, both indicators of consciousness. This is non-compliance with 9 CFR 313.30(a)(4) which states, "The stunned animal will remain in a state of surgical anesthesia through shackling, sticking, and bleeding. It is also in non-compliance with 9 CFR 313.30(b)(3) which states, "Each animal

11. SIGNATURE OF INSPECTION PROGRAM EMPLOYEE: [redacted]

You are hereby advised of your right to appeal this decision as delineated by 306.5 and/or 381.35 of 9 CFR.

12. PLANT MANAGEMENT RESPONSE (*Immediate action(s)*):

13. PLANT MANAGEMENT RESPONSE (*further planned action(s)*):

This document serves as written notification that your failure to comply with regulatory requirement(s) could result in additional regulatory or administrative action.

14. SIGNATURE OF PLANT MANAGEMENT: [redacted] 15. DATE: 12/10/04

16. VERIFICATION SIGNATURE OF: [redacted] 17. DATE: 1/19/05

FSIS FORM 5400-4 (7/98) Replaces FSIS Form 5400-4 (9/97), which may be used until exhausted. (7/98) DISTRIBUTION: Original & 1 copy - Establishment 1 copy - Inspector

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s.(b)(7)(C)

U.S. DEPARTMENT OF AGRICULTURE
FOOD SAFETY AND INSPECTION SERVICE

NONCOMPLIANCE RECORD CONTINUATION SHEET

TYPE OF NONCOMPLIANCE
☐ Food Safety ☒ Other Consumer Protection

1. DATE	2. RECORD NO.	3. ESTABLISHMENT NO.
11/29/2004	82-2004-7726	06544A M / 1

4. TO (Name and Title)	5. PERSONNEL NOTIFIED
Mr. Jim McConnell, Plant Manager	Mr. Jim McConnell

6. RELEVANT REGULATION(S)
313.30(a)(4), 313.30(b)(3)

7. RELEVANT SECTION/PAGE OF ESTABLISHMENT PROCEDURE/PLAN	HACCP	SSOP	OTHER

8. INP CODE	9. NONCOMPLIANCE INDICATOR
04C02	Product Protocol

10. DESCRIPTION OF NONCOMPLIANCE:

shall be given a sufficient application of electrical current to ensure surgical anesthesia throughout the bleeding operation." I applied U.S. Rejected tag No. B27 615553 to the stunner box and immediately notified [redacted] (both plant employees).

This document serves as written notification that your failure to comply with regulatory requirement(s) could result in additional regulatory or administrative action.

11. SIGNATURE OF INSPECTION PROGRAM EMPLOYEE [redacted]

15. DATE 11/29/04

PSIS FORM 5400-4 (7/98) Replaces PSIS Form 5400-4 (3/97), which may be exhausted. (7/98)

DISTRIBUTION: Original & 1 copy - Establishment
1 copy - Inspector

s.(b)(4)
s.(b)(6)
s.(b)(7)(C)

1/18/2005

RESPONSE TO NR 82-2004-1147

Immediate Actions:

The hog died.

Further planned Action:

Implement a [redacted] of amp to insure stunner working properly.

000087 *Regina Russell*

This request for this information is Voluntary. It is needed to monitor defects found in Slat Inspection system. It is used by FSIS to determine whether establishments are in compliance. 9CFR 301 and 9CFR 381. FORM APPROVED OMB NO. 0583-0029. OMB DISCLOSURE STATEMENT: Public reporting burden for this collection of information is estimated to average 7 minutes per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Department of Agriculture, Clearance Officer, OIRM, Room 404-W, Washington, D.C. 20250; and to the Office of Information and Regulatory Affairs, Office of Management and Budget.

U.S. DEPARTMENT OF AGRICULTURE
FOOD SAFETY AND INSPECTION SERVICE

NONCOMPLIANCE RECORD

TYPE OF NONCOMPLIANCE: ☐ Food Safety ☒ Other Consumer Protect

1. DATE	2. RECORD NO.	3. ESTABLISHMENT NO.
12/6/2004	90-2004-7726	06544A M / 1

4. TO (*Name and Title*)	5. PERSONNEL NOTIFIED
Mr. Jim McConnell, Plant Manager	Mr. Jim McConnell

6. RELEVANT REGULATION(S)
313.30(a)(3), 313.30(a)(1)

7. RELEVANT SECTION/PAGE OF ESTABLISHMENT PROCEDURES/PLAN	HACCP	SSOP	OTHER

8. ISP CODE 04C02

9. NONCOMPLIANCE CLASSIFICATION INDICATORS

PLANT PROCESS	A. ☐ SSOP	☐ Monitoring	☐ Corrective Action	☐ Recordkeeping	☐ Implementation
	B. ☐ HACCP	☐ Monitoring	☐ Corrective Action	☐ Recordkeeping	☐ Plant Verification
C.	☒ PRODUCT	☐ Exposure	☐ Misbranding	☒ Protocol	
D.	☐ FACILITY	☐ Lighting	☐ Structural	☐ Outside Premises	☐ Product Based
E.	☐ E. COLI	☐ Other			

10. DESCRIPTION OF NONCOMPLIANCE:

At 0925 I was observing stunning, sticking, and bleeding procedures in the V Belt area of the hog pen where the hogs are normally stunned, stuck, and bled. I observed a plant employee apply the stunner electrodes to a hog which instantly vocalized and began throwing her head from side to side and up and down in a purposeful manner. The hog showed blink reflex and purposeful tongue movement after the second stunning. Vocalization, blink reflex, and purposelid movement of the head and or tongue are all signs of consciousness.

11. SIGNATURE OF INSPECTION PROGRAM EMPLOYEE [redacted]

You are hereby apprised of your right to appeal this decision as delineated by 306.5 and/or 381.35 of 9 CFR.

12. PLANT MANAGEMENT RESPONSE *(Immediate actions(s))*:

13. PLANT MANAGEMENT RESPONSE *(further planned actions(s))*:

This document serves as written notification that your failure to comply with regulatory requirement(s) could result in additional regulatory or administrative action.

14. SIGNATURE OF PLANT MANAGEMENT Donna Russell

15. DATE 12-6-05

16. VERIFICATION SIGNATURE O [redacted]

17. DATE 1/13/05

FSIS FORM 5400-4 (7/98) Replaces FSIS Form 5400-4 (9/97), which may be used until exhausted. (7/98)

DISTRIBUTION: Original & 1 copy - Establishment 1 copy - Inspector

s.(b)(6)
s.(b)(7)(C)

U.S. DEPARTMENT OF AGRICULTURE
FOOD SAFETY AND INSPECTION SERVICE

NONCOMPLIANCE RECORD CONTINUATION SHEET

TYPE OF NONCOMPLIANCE: ☐ Food Safety ☒ Other Consumer Protection

1. DATE	2. RECORD NO.	3. ESTABLISHMENT NO.
12/6/2004	90-2004-7726	06544A M / 1

4. TO (Name and Title)	5. PERSONNEL NOTIFIED
Mr. Jim McConnell, Plant Manager	Mr. Jim McConnell

6. RELEVANT REGULATION(S)
313.30(a)(3), 313.30(a)(1)

7. RELEVANT SECTION/PAGE OF ESTABLISHMENT PROCEDURE/PLAN	HACCP	SSOP	OTHER

8. ISP CODE	9. NONCOMPLIANCE INDICATOR
04C02	Product Protocol

10. DESCRIPTION OF NONCOMPLIANCE:

This is non-compliance with 9 CFR 313.30(a)(3) which states, "The quality and location on the electrical shock shall be such as to produce immediate insensibility to pain in the exposed animal."

This is non-compliance with 9 CFR 313.30(a)(1) which states, "The electric current shall be administered so as to produce, at a minimum, surgical anesthesia, i.e., a state where the animal feels no pain sensation." "They shall be exposed to the electric current in a way that will accomplish the desired result quickly and effectively, with a minimum of excitement and discomfort."

The third stunning of the hog rendered her unconscious and in a state of surgical anesthesia at which time she was stuck and the bleeding process began.

I immediately stopped the stunning and notified [redacted] (kill floor supervisor), who immediately took control.

This document serves as written notification that your failure to comply with regulatory requirement(s) could result in additional regulatory or administrative action.

11. SIGNATURE OF INSPECTION PROGRAM E[redacted] 15. DATE: 12/6/04

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 s.(b)(6) s.(b)(7)(C)

RESPONSE TO NR 90-2004-7726

Immediate Actions:

The hog was finally stun and stuck.

Further planned Action:

The electrical stunner has been placed on preventive Maintence to ensure that it works properly.

000090 *Regina Russell*

s.(b)(6)
s.(b)(7)(C)

US Department of Agriculture
FOOD SAFETY AND INSPECTION SERVICE
NONCOMPLIANCE RECORD

TYPE OF NONCOMPLIANCE: ☐ Food Safety ☒ Other Consumer Protection

1. DATE	2. RECORD NO.	3. ESTABLISHMENT NO.
06/29/2005	0096-2005-7726	06541A M / 1

4. TO (Name and Title)	5. PERSONNEL NOTIFIED
Mr. Jim McConnell, Plant Manager	Mr. Jim McConnell

6. RELEVANT REGULATION(S)

313.15(a)

7. SECTION/PAGE OF EST. PROCEDURE PLAN	HACCP	SSOP	OTHER

8. ISP CODE	9. NONCOMPLIANCE CLASSIFICATION INDICATORS
04C02	PRODUCT - Protocol

10. DESCRIPTION OF NONCOMPLIANCE

At 0548 while in the hog pen area doing ante-mortem inspection I observed [redacted] (hog pen manager) use a captive bolt to stun a down hog that was located in the rear of a trailer. The first shot caused the hog to immediately vocalize and thrash her head and front parts around in purposeful movement (signs of consciousness and sensibility). She continuously vocalized and thrashed her front parts around in purposeful movement after the first shot, second shot and third shot. It was the fourth shot (more than 3 minutes from the first shot to the fourth shot) that the hog became unconscious and insensitive. I applied to U.S. Reject Tag No. B 34568472 to the unloading ramp and immediately notified [redacted] (kill floor supervisor) who took charge after which I removed the U.S. Reject Tag. This is regulatory non-compliance with 9 CFR 313.15(a).

Further regulatory noncompliance could lead to more stringent regulatory control action as per Rules of Practice 500.4.

11. SIGNATURE OF INSPECTION PROGRAM EMPLOYEE

[redacted]

You are hereby advised of your right to appeal any decision as provided by 306.5 and/or 381.35 of 9 CFR.

12. PLANT MANAGEMENT RESPONSE (Immediate action(s)):

13. PLANT MANAGEMENT RESPONSE (further planned action(s)):

This document serves as written notification that your failure to comply with regulatory requirement(s) could result in additional regulatory or administrative action.

14. SIGNATURE OF PLANT MANAGEMENT: Regina Russell — 15. DATE: June 30 2005

16. VERIFICATION [redacted] EMPLOYEE — 17. DATE: 7/5/05

FSIS FORM 5400-4 (7/98)
Replaces FSIS Form 5400-4 (9/97), which may be used until exhausted (7/98)

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s.(b)(6)
s.(b)(7)(C)

RESPONSE TO NR 96-2005-7726

Immediate Actions:

We discussed with [redacted] Not to stun any hogs again.

Further planned Action:

A signed copy by [redacted] that [redacted] will no longer use any stunner. A member of management must be notified by hog pen personnel if a hog will need to be stun. Only experience stunner personnel will use the electric stunner. Kill supervisors will use the captive bolt stunner.

000092 Regina Russell

 s.(b)(6) s.(b)(7)(C)

To: [redacted]
IIC, Establishment [illegible]
Odom's Tennessee Pride
4701 Asher Avenue
Little Rock, AR 72204

From: Jim McConnell, plant manager
Odom's Tennessee Pride
4701 Asher Avenue
Little Rock, AR 72204

RE: Clarification of Noncompliance Record No. 0096-2005-7726.

In our response to NR 0096-2005-7726 we stated that [redacted] would not be stunning any hogs again. What we meant to say was that [redacted] would not use the captive bolt stunner, but could continue to use the portable electric stunner. We would also like to have the option to give [redacted] some additional training on the captive bolt stunner and have [redacted] certified to use it in the future. Your immediate response to this request would be greatly appreciated.

Jim McConnell
Plant Manager
Odom's Tennessee Pride

s.(b)(6)
s.(b)(7)(C)

To: [redacted]
II, Establishment 6544A
Odom's Tennessee Pride
4701 Asher Avenue
Little Rock, AR 72204

From: Jim McConnell, Plant Manager
Odom's Tennessee Pride Sausage
4701 Asher Avenue
Little Rock AR 72204

RE: Clarification to Response for Noncompliance Record No. 0096-2005-7726

In our response we stated that I [redacted] would not Stun Hogs again unless he was trained and certified. At this time I would like to clarify the term certified. Our meaning of certified is to have [redacted] trained by our Kill Floor Supervisor and Tested by at least two members of our in-house Humane Handling Committee. At this time we will fill out training documentation signed by [redacted] and the Team members. This documentation would be placed in [redacted] personnel file.

Jim McConnell 5-2-06

Jim McConnell
Plant Manager
Odom's Tennessee Pride Sausage

US Department of Agriculture
FOOD SAFETY AND INSPECTION SERVICE
NONCOMPLIANCE RECORD

TYPE OF NONCOMPLIANCE: ☐ Food Safety ☒ Other Consumer Protection

1. DATE	2. RECORD NO.	3. ESTABLISHMENT NO.
08/16/2005	0134-2005-7726	06544A M / 1

4. TO (Name and Title)	5. PERSONNEL NOTIFIED
Mr. Jim McConnell, Plant Manager	Mr. Jim McConnell

6. RELEVANT REGULATION(S)

313.2(c)

7. SECTION/PAGE OF EST. PROCEDURE PLAN | HACCP | SSOP | OTHER

8. ISP CODE	9. NONCOMPLIANCE CLASSIFICATION INDICATORS
04C02	PRODUCT - Protocol

10. DESCRIPTION OF NONCOMPLIANCE

Prior to 0545 I was in the hog pen area performing routine ante-mortem inspection. I performed ante-mortem inspection on a group of hogs that by 0545 had been placed in HP-1, HP-2, the crowd pen, and the moving v-belt (none of which has water available for drinking by the hogs). These areas are for moving the hogs to the stunning area for stunning which is to begin at 0600. At 0730 the stunning had not yet started and I observed these same hogs still in HP-1, HP-2, the crowd pen, and the moving v-belt and the hogs had no water available to them for drinking. Since these hogs had not moved from these areas in more than 1 1/2 hours, it is reasonable to define the areas they were in as holding pens. This is regulatory non-compliance with 9 CFR 313.2(c). I immediately notified [redacted] (Superintendent). [redacted] (kill floor supervisor) was in the immediate area and took control by moving the hogs out of these areas into an area where water for them to drink could be and was provided.

Further regulatory noncompliance could lead to more stringent regulatory control action as per Rules of Practice 500.4.

11. SIGNATURE OF INSPECTION PROGRAM EMPLOYEE

[redacted]

You are hereby advised of your right to appeal this decision as delineated in 500.5 and/or 381.35 of 9 CFR.

12. PLANT MANAGEMENT RESPONSE (Immediate action(s)):

13. PLANT MANAGEMENT RESPONSE (further planned action(s)):

This document serves as written notification that your failure to comply with regulatory requirement(s) could result in additional regulatory or administrative action.

14. SIGNATURE OF PLANT MANAGEMENT [redacted] 15. DATE 8/31/05

16. VERIFICATION SIGNATURE OF PROGRAM EMPLOYEE [redacted] 17. DATE 9/15/05

FSIS FORM 5400-4 (7/98)
Replaces FSIS Form 5400-4 (9/97), which may be used until exhausted (7/98)

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s.(b)(6)
s.(b)(7)(C)

RESPONSE TO NR 134-2005-7726

Immediate Actions:

Hogs were given water

Further planned Action:

Water is now accessible in HP-1 and Hp-2.

Regina Russell

US Department of Agriculture
FOOD SAFETY AND INSPECTION SERVICE
NONCOMPLIANCE RECORD

TYPE OF NONCOMPLIANCE: ☐ Food Safety ☒ Other Consumer Protection

1. DATE	2. RECORD NO.	3. ESTABLISHMENT NO.
09/13/2005	0151-2005-7726	06544A M / I

4. TO (Name and Title)	5. PERSONNEL NOTIFIED
Mr. Jim McConnell, Plant Manager	Mr. Jim McConnell

6. RELEVANT REGULATION(S)

313.2

7. SECTION/PAGE OF EST. PROCEDURE PLAN | HACCP | SSOP | OTHER

8. ISP CODE	9. NONCOMPLIANCE CLASSIFICATION INDICATORS
04C02	PRODUCT - Protocol

10. DESCRIPTION OF NONCOMPLIANCE

At 1030 while in the hog pen area finishing ante-mortem inspection and performing the daily 04C02 (humane handling) procedure which for today was to make sure drinking water is available, I observed 2 hogs in the crowd pen with no water available and 3 hogs in the restrainer (not the V-belt) with no water available. Since the establishment employees in this area go to lunch break from 1030 to 1100 and had just left for lunch, it is reasonable to assume that the hogs would be without water until 1100, which they were. This is regulatory non-compliance with 9 CFR 313.2(c). I remained in the area until the employees returned at 1100 from lunch at which time I notified [redacted] (kill floor supervisor) of the non-compliance. The hogs were not in distress and were allowed to be slaughtered normally.

This NR links to NR 134-2005, written on 8/16/2005 with the same cause being failure to remove the hogs from the crowd pen and restrainer when the plant is not going to be operating for an extended period of time.

Further regulatory noncompliance could lead to more stringent regulatory control action as per Rules of Practice 500.4.

11. SIGNATURE OF INSPECTION PROGRAM EMPLOYEE

[redacted]

You are hereby advised of your right to appeal this decision as delineated by 306.5 and/or 381.35 of 9 CFR.

12. PLANT MANAGEMENT RESPONSE (Immediate action(s)):

13. PLANT MANAGEMENT RESPONSE (Further planned action(s)):

This document serves as written notification that your failure to comply with regulatory requirement(s) could result in additional regulatory or administrative action.

14. SIGNATURE OF PLANT MANAGEMENT [redacted] 15. DATE 9-8-05

16. VERIFICATION SIGNATURE [redacted] UPLOYEE 17. DATE 13/8/05

FSIS FORM 5400-4 (7/98)
Replaces FSIS Form 5400-4 (9/97), which may be used until exhausted (7/00)

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Page 1 of 1

 s.(b)(6) s.(b)(7)(C)

RESPONSE TO NR 151-2005-TT26

Immediate Actions:

The hogs had access to water prior being in area with out water. The hog were resting during this time. According to NR written the hogs were not distress.

Further planned Action:

No hogs will be in the restrainer during lunch break. The hogs will either be killed out or back out of the restrainer during lunch time. According to NR written the hogs were not distress

Regina Russell

US Department of Agriculture
FOOD SAFETY AND INSPECTION SERVICE
NONCOMPLIANCE RECORD

TYPE OF NONCOMPLIANCE: ☐ Food Safety ☒ Other Consumer Protection

1. DATE	2. RECORD NO.	3. ESTABLISHMENT NO.
03/16/2006	0025-2006-9184	06544A M / 1

4. TO (Name and Title)	5. PERSONNEL NOTIFIED
Mr. Jim McConnell, Plant Manager	Mr. Jim McConnell

6. RELEVANT REGULATION(S)

313.15

7. SECTION/PAGE OF EST. PROCEDURE PLAN	HACCP	SSOP	OTHER

8. ISP CODE	9. NONCOMPLIANCE CLASSIFICATION INDICATORS
04C02	PRODUCT - Protocol

10. DESCRIPTION OF NONCOMPLIANCE

At approximately 0600 hours while in the hog pen area performing ante-mortem inspection, [redacted] (kill floor supervisor) advised me that a downer hog that had been previously stunned with a captive bolt stunner was going to require a second stunning. I observed the hog that had been previously stunned sitting upright and fully conscious. A second shot with the captive bolt stunner caused the hog to vocalize and failed to render the animal unconscious and insensitive. This is regulatory noncompliance with 9 CFR 313.15(a)(1) and 9 CFR 313.15(a)(3). I immediately applied U. S. Reject Tag Number B27834700 to the captive bolt stunner and the hog was stunned a third time with a portable electric stunner which immediately rendered the hog unconscious and insensitive. [redacted] later assured me that it was a misplacement of the captive bolt and not a failure of the devise at which time I removed the reject tag.

This document serves as written notification that your failure to comply with regulatory requirement(s) could result in additional regulatory or administrative action.

11. SIGNATURE OF INSPECTION PROGRAM EMPLOYEE

[redacted]

You are hereby advised of your right to appeal this decision as delineated by 306.5 and/or 381.35 of 9 CFR.

12. PLANT MANAGEMENT RESPONSE (Immediate action(s)):

13. PLANT MANAGEMENT RESPONSE (further planned action(s)):

This document serves as written notification that your failure to comply with regulatory requirement(s) could result in additional regulatory or administrative action.

14. SIGNATURE OF PLANT MANAGEMENT [redacted] 15. DATE 4/20/06

16. VERIFICATION SIGNATURE OF INSPECTION PROGRAM EMPLOYEE [redacted] 17. DATE 4/21/06

FSIS FORM 5400-4 (7/98)
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s.(b)(6)
s.(b)(7)(C)

RESPONSE TO NR 25-2006-9184

Immediate Actions:

Hog was stunned and rendered unconscious.

Further planned Action:

Supervisor admitted that he misplaced the captive bolt.

Regina Russell

US Department of Agriculture
FOOD SAFETY AND INSPECTION SERVICE
NONCOMPLIANCE RECORD

TYPE OF NONCOMPLIANCE: [ ] Food Safety [X] Other Consumer Protection

1. DATE	2. RECORD NO.	3. ESTABLISHMENT NO.
12/27/2005	0021-2005-9213	10650 M / 1

4. TO (Name and Title)	5. PERSONNEL NOTIFIED
Darren Garner, Foreman	Darren Garner

6. RELEVANT REGULATION(S)

313.2

7. SECTION/PAGE OF EST. PROCEDURE PLAN	[ ] HACCP	[ ] SSOP	[ ] OTHER

8. ISP CODE	9. NONCOMPLIANCE CLASSIFICATION INDICATORS
04C02	PRODUCT - Protocol

10. DESCRIPTION OF NONCOMPLIANCE

At approx. 0745 hrs. while performing AM inspection I observed a pen with approx. 20 hogs that did not have any water available. The hogs had been delivered on the previous day. An empty water tub was in the pen and the pen is on a nipple water system, but it had been shut off. I notified Darren of the noncompliance. 313.2(e) states in part, "animals shall have access to water in all holding pens." The plant had received a Letter Of Warning ,9/22/05, for humane slaughter noncompliances which included animals not having access to water.

Darren went out and turned on the water system, but there was a leak. He moved the hogs to another pen with water in tubs.

Similar NR 15-2005, 7/25/05. Previous plant actions to be sure pens are supplied with water and installing water system were either not implemented or were ineffective in preventing the noncompliance.

11. SIGNATURE OF INSPECTION PROGRAM EMPLOYEE

[redacted]

You are hereby advised of your right to appeal this decision as determined by 306.5 and/or 381.35 of 9 CFR.

12. PLANT MANAGEMENT RESPONSE (immediate action(s)):

Turned on water system, it was leaking. Move hogs to pens with tubs of water.

13. PLANT MANAGEMENT RESPONSE (further planned action(s)):

If water system isn't working tell supplyer to make sure plenty of tubs of water for amount of hogs.

This document serves as written notification that your failure to comply with regulatory requirement(s) could result in additional regulatory or administrative action.

14. SIGNATURE OF PLANT MANAGEMENT	15. DATE
D Garner	12-28-05
16. VERIFICATION SIGNATURE OF INSPECTION PROGRAM EMPLOYEE	17. DATE
[redacted]	1/6/06

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Page 1 of 1

s.(b)(6)

U.S. DEPARTMENT OF AGRICULTURE
FOOD SAFETY AND INSPECTION SERVICE

NONCOMPLIANCE RECORD

TYPE OF NONCOMPLIANCE s.(b)(7)(C)

☐ Food Safety ☒ Other Consumer Protection

1. DATE	2. RECORD NO.	3. ESTABLISHMENT NO.
1/23/03	2-2003-2055	20560 M / 1

4. TO (*Name and Title*)	5. PERSONNEL NOTIFIED
Martin Ziegler, President/GM	Martin Ziegler

6. RELEVANT REGULATION(S)
313.15, 313.30, 313.1, 313.2 e

7. RELEVANT SECTION/PAGE OF ESTABLISHMENT PROCEDURE/PLAN	HACCP	SSOP	OTHER

8. ISP CODE 04C02

9. NONCOMPLIANCE CLASSIFICATION INDICATORS

PLANT PROCESS	A. ☐ SSOP	☐ Monitoring	☐ Corrective Action	☐ Recordkeeping	☐ Implementation
	B. ☐ HACCP	☐ Monitoring	☐ Corrective Action	☐ Recordkeeping	☐ Plant Verification
C.	☒ PRODUCT	☐ Economic	☐ Misbranding	☒ Protocol	
D.	☐ FACILITY	☐ Lighting	☐ Structural	☐ Outside Premises	☐ Product Based
E.	☐ E. COLI	☐ Other			

10. DESCRIPTION OF NONCOMPLIANCE:

At approximately 0730 hours, while performing 04C02 procedure, I observed the following deficiencies. The animal holding pens do not have sufficient water supply for all the animals that are brought into the plant for slaughter. There is a water bowl located on the south east wall that is in working condition but it is to high for the swine to make use of it. There is also a water bowl located on the north wall that does not work at this time. All the other holding pens do not currently have a water supply for the animals. 313.2e of the regulations states that, (animals shall have access to water in all holding pens).

[redacted]

You are hereby advised of your right to appeal this decision as delineated in 306.5 and/or 381.35 of 9 CFR.

12. PLANT MANAGEMENT RESPONSE *(Immediate actions(s))*:

See attached Sheet

13. PLANT MANAGEMENT RESPONSE *(further planned actions(s))*:

See attached Sheet

This document serves as written notification that your failure to comply with regulatory requirement(s) could result in additional regulatory or administrative action.

14. SIGNATURE OF PLANT MANAGEMENT	15. DATE
[redacted]	02.09.03
16. [redacted] GRAM EMPLOYEE	17. DATE 06-19-03

FSIS FORM 5400-4 (7/98) Replaces FSIS Form 5400-4 (9/97), which may be used until exhausted.(7/98) DISTRIBUTION: Original & 1 copy - Establishment, 1 copy - Inspector

s.(b)(4)
s.(b)(6)
s.(b)(7)(C)

Deutschland Meats Inc.

141 S. Main St.
PO Box 52
Sanborn, MN 56083
Redwood County

Phone (507) 648-3388
Fax (507)648-3381

February 13, 2003

IIC USDA/FSIS
EST. 20560
Sanborn, MN 56083

This is in reply to your NR # 2-2002-2055 from 01.23.03.
This additional reply will address the stunning issues better than the original reply.
After my conversation with Professor from Colorado State University, on 02.13.03, about these issues I am more clear about how misunderstandings can happen.
In our case we will continue using the with its loads according to instructions on the load packages. The loads are color-coded and are used accordingly to the weights of the animals.
Heavy animals will be stunned with a black load from now on. The proper storage of the loads was explained to me by Prof. as to be in a dry area (front office). also suggested the frequent cleaning and maintenance of the stun gun to assure proper function. We will have a sheet available which will show the maintenance and cleaning performed on the gun (see attached copy). Lighter animals may be (according to stunned with different colored loads.
The Elk stunning will be
According to Prof. this load should be plenty sufficient to knock any Elk. The area in which the Elk will be stunned will be

According to Prof. from Colorado State University, and Prof. from Minnesota State University, animal science, the electric stunner used at our facilities should be sufficient enough to stun the hogs. We will assure proper maintenance of the electric stunner, as well as restraining the animals between a gate and the wall. The proper method of stunning (described in attached prints will be followed.
We tested the output of our electric stunner and found the electric current to correspond with the numbers on the stun box, and the amperage of the current flow showed According to Prof. (verbally) 5 seconds of stun time should be plenty enough, but the problem we might experience results from the time delay between stunning and sticking. The time between stunning and sticking should not exceed 20 or the most 30 seconds. (Referenced in attached copies).
The blinking as mentioned in the NR, is a common thing to happen at electric stunning (according to , Referencing to HOW TO DETERMINE INSENSIBILITY by I cannot see how our stunning methods would not have been acceptable.
The reason the hogs were on their way back to sensibility was because we had to wait for to watch for a possible blinking for an extended period. According to , the hogs need to be stuck within 20 and under no circumstances after 30 seconds from the stun. If that would happen the animal needs to be stunned immediately again, to assure humane handling.
Attached please find supportive documentation from PHD as well as PHD.

1. Fax from PHD DVM (5 pages)
2. Web site Downloads from referred by in my phone conversation on 02.13.03) (70 pages)

s.(b)(6)
s.(b)(7)(C)

Sincerely,

Martin Ziegler

cc: File 2-2003-2055 USDA 2nd
cc:
cc: Inspector [redacted] HC Est: 20560

s.(b)(6)
s.(b)(7)(C)

Deutschland Meats Inc.

141 S. Main St.
PO Box 52
Sanborn, MN 56083
Redwood County

Phone (507) 648-3388
Fax (507)648-3381

February 9, 2003

IIC USDA/FSIS
EST. 20560
Sanborn, MN 56083

This is in reply to your NR # 2-2002-2055 from 01.23.03.
There are 6 areas in the holding facility which animals can be stored. One area, which is behind the wall, used for hogs, has a water cup on the west wall mounted and is functional. The water cup, I believe, is not too high up from the ground and I believe that it is accessible to the animals. But according to your request we will lower that cup a few inches to make it easier for the animals to drink. (this project should be completed by March 1st 2003).
The two larger holding areas are also equipped with a cup, which was recently destroyed by the hogs. The repair of that cup is also scheduled to be completed by March 1st. 2003. In the mean time we will supply the animals with water through buckets or other means of portable water containers to assure that the animals have water according to the regulations. The other 3 shoots are considered drive shoots and after the regulations do not need to be equipped with water fountains for the animals.
To prevent slipping and falling, we added cattle mats to the unloading area and the holding areas.
To correct the stunning mishap on the cattle, we will use a stronger load in the captive bolt at large animals and we will store the loads in a dry place to prevent the powder from getting moist through the clean up humidity.
The Elk was stunned after the first shot, but (?) wanted me to shoot the animal a second time. The animal seemed to get back to live after the second shot. To correct the stunning problems on the hogs we will not follow the suggested method of we will not have a person hold on to the animal while a second person stuns it with the electric stunner. The current of the stunner would electrocute the person that would hold on to the animal. In this case the person would die and the hog would not be stunned. Electricity will always travel to the last point and from there leave to ground. OSHA would not agree with that method.
We will restrain the animals and stun them behind the ears. The stunner will be checked for performance every so often.
"A blink" or heavy breathing does not mean that the animal is not stunned properly. Sometimes the nerves can cause " A BLINK ", as long as the tongue hangs out of the mouth and the eyes are open and not moving around the animal is considered stunned.
Stunning does not mean KILLING the animal. The animal will die through blood loss. In that process the animal will breath and you may be able to hear the breathing. Sometimes it may even sound like a cough or similar noises. This is not considered vocalization, it is just normal noise caused by breathing under being stunned.
The stress level of the animal has a lot to do in that matter. If an animal is more stressed at the time it gets stunned, there will be heavier breathing than if the animal was calm before the stunning.
I hope these measures are acceptable to the USDA. If not please let me know right away so we can take action to correct them.

cc: 2-2003-2055 USDA

00085B M.NR Summary
For Period: 12/10/2004 to 12/10/2005

s.(b)(6)
s.(b)(7)(C)

Date	Procedure	Result	NR#	Insp.	Shift	Appeal (Yes)	Open (Yes)	Reported To
11/18/2005	*04C02*	*I*	*0091-2005-5471*					*i*

At 1345, while observing swine carcasses on the bleed chain that had completed the stunning and sticking process, I observed one shackled swine exhibiting the following signs: regular respiration, sporadic blinking and occasional foreleg movements. These signs were observed as the affected animal moved along the bleed chain immediately prior to the stair step rails past the second establishment suspect pen. I further investigated the animal's signs by touching its eyelids and determined the animal had an intact blink reflex. I then determined that this animal was exhibiting signs of consciousness and needed immediate corrective actions to assure humane slaughter. Since I did not observe any establishment employees taking corrective actions at this time I took the regulatory control actions of shutting off the bleed chain at 1346, pointing out the affected animal to an establishment employee for further stunning, and stopping the stunning process by tagging the entrances to the butinas with USDA Retain tags #'s B35521474 and 75. After notifying the front line supervisor I held a meeting with establishment officials who provided me with acceptable corrective and preventive measures to assure humane slaughter. I returned production to establishment control at approximately 1405.

s.(b)(6)
s.(b)(7)(C)

Date	Procedure	Result	NR#	Insp.	Shift	Appeal (Yes)	Open (Yes)	Reported To
2/15/2005	*04C02*	*I*	*0035-2005-6264*		*1*			

On 2/15/05 at approximately 1220 hours while was performing ante-mortem inspection the following was observed. A non-ambulatory animal was located in the main drive way between the tattoo station and the holding pens. A group of hogs was on the scales, waiting to be driven through the tattoo station for identification and then on to their respective holding pen. The plant employee, that was going to apply the tattoos, took a "rattle" and prodded the down animal which then attempted to get up and walk but was unable to move. This same employee then resumed his place at the tattoo station ready to apply the tattoos to the animals that would be coming off the scales. Another plant employee then motioned for a third employee to open the gate to the scales and allow the animals to proceed down the alley way past the tattoo station and on to their holding pen. This would have caused the hogs to walk over the non- ambulatory pig. As soon as the gate to the scales, was opened and hogs were allowed on the alley way surface, as required by 9CFR 313.50(b), placed a U.S. REJECTED TAG NO. B21667365 on the alleyway of the tattoo station and the plant employees were instructed to return the animals to the scale area and the gate was closed. was notified that regulatory action had been taken and that the alleyway had been "REJECTED". The situation was explained to and instructed a plant employee to use the bobcat to remove the "downer" animal to a separate, appropriate holding area. Once the down animal was removed and the alleyway was found to be clear, the rejected notice was removed and the plant was allowed to continue daily functions. This was a noncompliance with 9CFR 313.2(d) (1). This is similar to NR 0019-2005-6264. Failure to comply with regulatory requirements could result in additional regulatory or administrative action.

3/31/2005	*04C02*	*I*	*0048-2005-6264*		*1*			

At approximately 0700, I went to check the non-ambulatory hogs that had been placed in the suspect pen for Veterinary disposition. I noticed that one of the pigs had its left hind foot cut almost off, with just the skin attaching it to the body. Also the pig had two lacerations on the medial side of the same leg . The near amputation of the hind extremity appeared to be the result of some type of shearing force like that produced by the bucket of the skid steer loader. Plant management was notified of the inhumane handling issue and I took regulatory action per 500.2(a)(4), and refused to let them start the slaughter operation (AM had been performed, already prior to start up of operations). (Operations Manager) informed me upon viewing said animal that they would humanely put the hog down and start an investigation as to the cause of the inhumane action.

3/31/2005	*04C02*	*I*	*0050-2005-6264*		*2*			

At approximately 1900 hours on 3/31/2005 was performing procedure 04C02. noticed a sharp cut wound (with fresh clean blood) approximately 2 inches above the claw on the right hind foot, of more than one hog. The injured hogs were observed on the shackle table just after the stunning process. notified Supervisor of the injury to the hogs and acknowledged the wound was there. stopped the stunning operation and took a regulatory control action by placing US Reject Tag #B345944805 on the drive alley immediately after the circle pen. notified Supervisor and Superintendent verbally and in writing with this NR of the noncompliance for the inhumane treatment of animals.

On March 29th notified I that had observed a similar injury on a hog on the right hind foot in the same location of the plant. On March 30th during the weekly USDA/Tyson meeting stated that found the reason the animals were injured and had it corrected. On March 31st (IIC) observed the same type of injury on a hog notified the day shift plant management and requested they correct the problem.

At approximately 2002 hours notified the problem had been found in the circle pen and was corrected. removed the tag and the slaughter process resumed. The establishment has the responsibility to keep all equipment including drive allies, floors, gates in good repair in order to prevent injuries to the animals.

7/7/2005	*04C02*	*I*	*0096-2005-6264*		*2*			

On 07/07/2005, at approximately 1845 hours I was performing procedure 04C02. I noticed a sharp cut wound (fresh blood) above the claw on the right hind foot of several carcasses. The injured hogs were observed after they had been stunned and shackled. I notified Supervisor and Superintendent of one of the injured hogs and they

Date	Procedure	Result	NR#	Insp.	Shift	Appeal (Yes)	Open (Yes)	Reported To
7/7/2005	04C02	I	0096-2005-6264 (continued)					

acknowledged the wound was there. I stopped the stunning operation. All the hogs slaughtered prior to the operation stoppage were dressed, processed and prepared as usual. I notified Supervisor and Superintendent verbally and in writing with this NR of the noncompliance for inhumane treatment of animals. notified me that the problem had been identified and corrected. The stunning operation was allowed to resume, I performed another 04C02 procedure in the same area and agreed the cause for the injuries to the animals appeared to corrected at that time.

7/8/2005 04C02 I 0097-2005-6264 2

On 07/08/05 at approximately 1753 hours, I was performing procedure 04C02 on the kill floor. I noticed a sharp cut wound (fresh blood) at the claws on the right hind feet of several carcasses. The injured hogs were observed after they had been stunned and shackled. I stopped the stunning operation and notified Superintendent observed the injured foot of the animal and acknowledged the wound was present. All of the hogs slaughtered prior to the operation being stopped were dressed and processed as routine daily operation. asked for more time to search for the reason the injuries were occurring. He notified the maintenance crew who started to work in the area to locate the problem. request for more time to work on finding the cause was granted and the stunning operation resumed. I notified erbally and in writing with this NR of the noncompliance for the inhumane treatment of animals. A similar NR#96-2005-6264 was written on 07/07/2005 after similar wounds were found on carcasses in this area. has been notified that the establishment's further planned action to prevent injury to the hogs was not effective. Continued failure to meet regulatory requirements can lead to enforcement action.

7/11/2005 04C02 I 0099-2005-6264 2

At approximately 2000 hours Inspector was performing procedure 04C02 in the stunning area of the kill floor. Inspector noticed a carcass that had a clean cut (fresh blood) on it's right hind foot. This hog was observed immediately after being stunned. Inspector stopped the stunning operation by placing U.S. Reject Tag #B35945926 on the stunner control box, but allowed all carcasses that were slaughtered prior to the stoppage to be processed as normal. Supervisor and Superintendent were notified and were given an opportunity to examine the wound on the carcass. Inspector Adams informed that the stunning operation was suspended pending release approval from and Maintenance Supervisor proposed a plan to try find the cause of the injuries. The plan was accepted by and Inspector eleased the stunning operation at 2040 hours and removed previous mentioned tag. Only the north side of the drive alley was used until 2047 hours when an injured hog was observed. Then the south side was utilized from 2047 hours until an injured hog was observed at 2103 hours. At this point the establishment stopped the stunning operation sent their employees to lunch. While the operation was off the skid plate underneath the squeeze chute was replaced. Since the plate has been replaced there has been no injured hogs reported. was notified verbally and in writing with this NR of the failure to comply with regulatory requirements concerning the humane treatment of animals. A similar NR #0097-2005-6264 was written on 07/08/2005 when a similar wound was observed on a carcass in this area of the plant. Preventative measures were either not implemented or not effective to prevent a reoccurrence. Continued failure to comply with regulatory requirements could result in additional regulatory or administrative action.

9/14/2005 04C02 I 0129-2005-6264 2

At approximately 1745 hours, while performing procedure code 04C02, heard a hog vocalizing (loud screams). observed a plant employee pulling on the ears of a strained, conscious hog. The hog appeared to be disabled (not moving legs, unwilling or unable to move) and blocking the path to the stunning machine. The production line was shut off by the establishment. The plant employee was trying to take the hog out the side door by pulling on its ears in an unsuccessful attempt to remove it from the drive way. asked the employee to stop what he was doing and also asked the lead person to humanly dispose of the hog. After the lead person rendered the hog insensible and he removed it from the area production was allowed to continue. Supervisor and Superintendent were notified verbally and in writing with this NR of the failure to comply with regulatory requirements.

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s.(b)(6)

s.(b)(7)(C)

06785 M NR Summary
For Period: 12/10/2004 to 12/10/2005

Date	Procedure	Result	NR#	Insp.	Shift	Appeal (Yes)	Open (Yes)	Reported To
6/7/2005	*04C02*	*I*	*0003-2005-5499*		*1*			

While performing ante-mortem inspection at 0530 this morning, I observed that there was an open floor drain at the entrance/exit of pen #4. The cover was broken and knocked out of place, creating a potential for injury, in violation of the Federal Humane Slaughter Act. I placed U.S. Rejected Tag no. B22841453 on the pen and informed of the situation. Maintenance was notified immediately and repaired the cover later in the morning, at which time the pen was released for use.

11/14/2005 *04C02* *I* *0006-2005-6467* *1*

While performing antemortem at 05:30, I observed that holding pens 1, 2, 3, and 4 did not have water. There were hogs in the pens at this time. I then notified the slaughter foreman and tagged the area using U.S. Rejected tag number 142592.

then contacted maintenance and discovered that the water had been turned off to fix a water leak. then informed me that the water was turned back on. I then went back and verified that all the holding pens now had sufficient water. At 0600 I removed the U.S. Reject tag and operations resumed.

A check of plant records reveals no recent, similar NRs.

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s.(b)(6)
s.(b)(7)(C)

17496 M NR Summary
For Period: 12/10/2004 to 12/10/2005

Date	Procedure	Result	NR#	Insp.	Shift	Appeal (Yes)	Open (Yes)	Reported To
12/29/2004	*04C02*	*I*	*0085-2004-5262*		*1*			

At approximately 15:00 hours there was a skip in the slaughter line due to the probes on the electrical stunner being broken. After the probes were fixed and before the carcasses were exiting the scald tank Consumer Safety Inspector observed the following non-compliance with the Human Slaughter regulations: The employee stunning the hogs was banging the probe into the back of the hog's head, applying electrical current and pulling the probe away from the hog's head then reapplying the probe for the remainder of the current. CSI stopped production and notified that there was a Humane Slaughter non-compliance and that production was stopped for the day. CSI call and notified of the non-compliance. Also a copy of this NR is being sent to District Veterinary Medical Specialist, Front Line Supervisor Elkhart Circuit Chicago District.

Regulation 313.3(b)(3) states
(3) "Electric current. Each animal shall be given a sufficient application of electric current to ensure surgical anesthesia throughout the bleeding operation. Suitable timing, voltage and current control devices shall be used to ensure that each animal receives the necessary electrical charge to produce immediate unconsciousness. The current shall be applied so as to avoid the production of hemorrhages or other tissue changes which could interfere with inspection procedures."

Regulation 313.30(a)(1) states "The electric current shall be administered so as to produce, at the minimum, surgical anesthesia,

Regulation 313.30(a)(3) states "The quality and location of the electrical shock shall be such as to produce immediate insensibility to pain in the exposed animal."

Regulation 313.30(b)(1) states " General requirements for operator. It is necessary that the operator of electric current application equipment be skilled attentive, and aware of his responsibility."

This is a repeat NR as documented by NR 8-2003-2482 dated 3/26/2 00 3.This document serves as written notification that your failure to comply with regulatory requirement(s) could result in additional regulatory or administrative action.

s.(b)(6)
s.(b)(7)(C)

21332 M NR Summary
For Period: 12/10/2004 to 12/10/2005

Date	Procedure	Result	NR#	Insp.	Shift	Appeal (Yes)	Open (Yes)	Reported To
9/27/2005	*04C02*	*I*	*0013-2005-7030*		*1*			

Arriving at approximately 07:45 hours to perform PHV duties at the establishment I was alerted by Inspector that at about 07:30 hours, while was observing the handling of animals during ante-mortem inspection, he encountered a stockyard employee, dragging a conscious disabled hog by the ears in the alleyway leading to the slaughter holding area. immediately stopped operations and verbally notified the employee that actions represent a noncompliance with the requirement in 9CFR 313.2 (d) (2), which states: "the dragging of disabled animals and other animals unable to move, while conscious, is prohibited." Assistant Plant Manager, was also notified in regards to this observation. The firm's management took immediate corrective action by using a bucket lift to move the disabled hog to a segregated spot at the animal holding area and the operations were allowed to resume.

The clinical examination of the implicated animal revealed a female "downer" hog in a moribund state with pyrexia -- rectal temperature of 106.5 F. Based on the above findings it was tagged with US Condemned tag Z 4395500, humanely destroyed and denatured.

This document serves as written notification that the a faliure to comply with the regulations could lead to regulatory and/or administrative action, including suspension without prior notification.

31559 M NR Summary
For Period: 12/10/2004 to 12/10/2005

s.(b)(6)
s.(b)(7)(C)

Date	Procedure	Result	NR#	Insp.	Shift	Appeal (Yes)	Open (Yes)	Reported To
1/12/2005	*04C02*	*I*	*0003-2005-6384*		*1*			

At approximately 1240, I was performing the above task and observing the electric prod/alternative object use for Humane Activity Tracking. I noticed an employee was using excessive force at the circle pen to drive the pigs into the single file chute. I stopped production and would not allow any more pigs to enter the single file chute. I notified a supervisor of the infraction and that production was stopped. Downtime from this action was approximately 7 minutes. The supervisor explained to me a plan to prevent this from recurring and I allowed production to resume.

3/9/2005 *04C02* *I* *0011-2005-6384* *1*

At approximately 1125, while verifying HAT component Category V - Handling of Suspect and Disabled of the above cited task, I observed a truck driver driving ambulatory cull hogs over disabled, conscious hogs. The cull hogs were located in pen 3 (approximately 20 -25 hogs). Pen 1 was being used as the US Suspect pen, which is where the disabled hogs were located (6 hogs). Pen 1 and pen 3 connect by passing through pen 2. The truck driver that was going to haul the cull hogs away walked through pen 1, opened the gate to pen 2 then proceeded to open the gate to pen 3. The truck driver then proceeded to drive the hogs out of pen 3 through pen 2 and through pen 1. Two of the disabled hogs were laying perpendicular to the travel path of the ambulatory cull hogs. There was approximately a clear path by the disabled hogs of about a foot in width. The ambulatory hogs did not proceed to the clear path and went straight over the two disabled hogs. No protection was given to the disabled hogs. No attempt was made to move the disabled hogs out of the path of the ambulatory hogs. I stopped the progression of the ambulatory hogs and notified the supervisor of the noncompliance. This is in violation of 9 CFR Ch.III 313.2(d)(1) which says, "Disabled animals and other animals unable to move shall be separated from normal ambulatory animals and placed in the covered pen provided for in 313.1(c)." No production was lost but I did detain slaughter of the disabled livestock until the supervisor could give me verbal assurance of how this would be prevented in the future.

8/17/2005 *04C02* *I* *0028-2005-6384* *1*

At approximately 1304 while performing Humane Activity Tracking under the category of truck unloading, I observed a truck driver unloading pigs into the establishment. The driver repetitively hit a pig with a plastic bat with maximum force and when that did not achieve the desired results then kicked the pig repeatedly. I told to stop and informed a company employee to stop I then proceeded to the stun area and informed the assistant supervisor to stop stunning. I applied a USDA reject tag no. B36117931 to the alley leading to the stunning device. I then notified the plant manager of the regulation violation. The plant manager then came to me and gave me a verbal description of the plan the establishment would follow to correct the situation and prevent this from occurring. I then removed the USDA reject tag and allowed operations to begin. The establishment experienced approximately ten minutes of no production.

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s.(b)(4)

s.(b)(6)
s.(b)(7)(C)

00244I M NR Summary
For Period: 12/10/2005 to 05/23/2006

Date	Procedure	Result	NR#	Insp.	Shift	Appeal (Yes)	Open (Yes)	Reported To
1/26/2006	*04C02*	*1*	*0029-2006-6264*		*1*			

On 1-26-06 at approximately 1228 hours was performing ante mortem duties and saw the rear leg of a hog protruding beneath a trailer. The hog had fallen through the open drain of the trailer. notified the truck driver(who drives for) of the incident. The trailer number was and the truck was from The license number was also informed and showed (Barn Manager), and Mr. (Yard Supervisor). When prompted the hog was able to free itself from the drain and appeared to have no apparent injuries from the incident. The driver was instructed to replace the drain plugs properly. The driver explained to that the drain plugs had fallen out before because they are held in with bungee cords and the hogs pull them loose. The remaining hogs were unloaded without incident. notified and verbally and in writing with this NR of the failure to comply with regulatory humane handling requirements. Previous discussions with the plant about possible complications and problems with open drain plugs resulted in the plant sending out informative letters to all haulers. Also signs were posted around the barns stating that all drain plugs on trailers must be closed. Once a vehicle carrying livestock enters an official slaughter establishment's premises, the vehicle is considered to be a part of that establishment's premises. Regulation 313.1(a) states in part " unnecessary openings where the head, feet, or legs of an animal may be injured shall be repaired." Corrective actions included: the establishment called the trucking company and informed them of the incident. They were also informed the drain plugs should be inspected and repaired prior to hauling any more livestock. The driver was instructed to have the drain plugs in this trailer fixed before hauling more hogs. Preventive measures will be outlined in the answer to this NR. Failure to comply with regulatory requirements may lead to further regulatory or administrative action.

s.(b)(6)
s.(b)(7)(C)

00818 M NR Summary
For Period: 12/10/2005 to 05/23/2006

Date	Procedure	Result	NR#	Insp.	Shift	Appeal (Yes)	Open (Yes)	Reported To
1/25/2006	*04C02*	*1*	*0014-2006-6146*		*1*			*David Stearns, Executive VP/CO*

This afternoon at approximately 14:15, while performing regular daily verification of the humane handling requirements at the establishment's stunning area, I observed a market hog showing signs of downer. The animal layed prostrated in the chute in front of the stunning belt displaying spread hindquarters. It was breathing forcefully and unable to stand and walk. To move it the animal was been excessively prodded with an electric prod by company staff. I questioned the staff how the animal had reached the chute, but the answers sounded evasive and non-convincing. I discontinued the use of excessive force and directed the staff to push the hog gently from the chute and then electrically stun it. The stunned hog was then returned to the chute. At 14:25 the Kill Foremen and were alerted in regards to the situation in the stunning area. It was brought to their attention that the case is in noncompliance with 9CFR 313.2 and constitutes inhumane treatment.

000114

17564 M NR Summary
For Period: 12/10/2005 to 05/23/2006

s.(b)(6)
s.(b)(7)(C)

Date	Procedure	Result	NR#	Insp.	Shift	Appeal (Yes)	Open (Yes)	Reported To
3/17/2006	*04C02*	*I*	*0013-2006-8870*		*1*			

As ante mortem veterinarian, was signing for downed pigs in the large subject pen at 11:25 Friday morning. Directly in front of her view was the bobcat. An IPC employee had just finished loading a pig into the bucket. There were approximately 8 pigs scattered along three sides of the bobcat. The driver, an IPC employee, was backing up to exit the subject pen. observed him run over the front leg of a downed subject hog with the right rear tire of the bobcat.

The pig reacted by attempting to pull away. After the incident was over, the driver shut down the bobcat. He immediately admitted to the accident and took full responsibility. explained his actions to satisfaction. was then informed of the incident and the impending non-compliance. After talking with both felt assured no further action on her behalf was needed at that time (9 CFR 313.50 (b)).

s.(b)(6)

s.(b)(7)(C)

31559 M NR Summary
For Period: 12/10/2005 to 05/23/2006

Date	Procedure	Result	NR#	Insp.	Shift	Appeal (Yes)	Open (Yes)	Reported To
12/30/2005	*04C02*	*1*	*0042-2005-6384*		*1*			

At approximately 0720, I was performing humane activity tracking, checking animals for consciousness on the rail. I found a hog that was blinking and trying to right itself while it was hanging upside down from a shackle. I shut off the bleed chain to stop forward progression and turned to look for the employee who was supposed to monitor animals for regaining consciousness. I could not find the employee. I saw the assistant supervisor was working at the sticking station. I got his attention, he ran down to me, grabbed the captive bolt pistol and rendered the animal unconscious. I then went to the stunning equipment and applied US Reject tag #B26117847 to the stunning equipment. I informed the assistant supervisor in that area of what I did and why. The supervisor came to me and we discussed what had happened. then gave me verbal reassurance of a new procedure to prevent this from occurring in the future. I removed my tag from the stunning equipment. Approximate time of loss production, due to my tag, was 11 minutes and 12 seconds.

4/12/2006	*04C02*	*1*	*0011-2006-6384*		*1*			

At approximately 1400, while I was verifying the HAT category, handling during ante mortem, I observed the US Suspect pen (pen 01) had been opened and combined with pens 02 and 03 to make one big pen. There were 4 non-ambulatory hogs which had been identified by the establishment as non-ambulatory by paint on their backs. The 4 non-ambulatory hogs were mixed in with 91 ambulatory hogs in this pen. 9 CFR Ch. III 313.2(d)(1) says, "Disabled animals and other animals unable to move shall be separated from normal ambulatory animals and placed in the covered pen provided for in 313.1(c). I stopped production at the stun area by applying US Reject tag no. B36117735 to the stunner. The establishment gave me a written reassurance that non-ambulatory and ambulatory hogs would be segregated by only housing non-ambulatory hogs in the US Suspect pen (pen 01). I removed my tag and allowed operations to resume. The approximate amount of time in loss production was 30 minutes.

U.S. DEPARTMENT OF AGRICULTURE
FOOD SAFETY AND INSPECTION SERVICE

NONCOMPLIANCE RECORD

TYPE OF NONCOMPLIANCE: [ ] Food Safety [X] Other Consumer Protecti

1. DATE	2. RECORD NO.	3. ESTABLISHMENT NO.
12/4/2003	153-2003-6173	00244I M / 1 s.(b)(6) s.(b)(7)(C)

4. TO (*Name and Title*): Darrell Schmidt, Plant Manager

5. PERSONNEL NOTIFIED: [redacted]

6. RELEVANT REGULATION(S): 9CFR313.30 (b)(1); HMSA sec. 1901

7. RELEVANT SECTION/PAGE OF ESTABLISHMENT PROCEDURE/PLAN	HACCP	SSOP	OTHER
			XX

8. ISP CODE: 04C02

9. NONCOMPLIANCE CLASSIFICATION INDICATORS

PLANT PROCESS	A. [ ] SSOP	[ ] Monitoring	[ ] Corrective Action	[ ] Recordkeeping	[ ] Implementation
	B. [ ] HACCP	[ ] Monitoring	[ ] Corrective Action	[ ] Recordkeeping	[ ] Plant Verification
C.	[X] PRODUCT	[ ] Economic	[ ] Misbranding	[X] Protocol	
D.	[ ] FACILITY	[ ] Lighting	[ ] Structural	[ ] Outside Premises	[ ] Product Based
E.	[ ] E. COLI	[ ] Other			

10. DESCRIPTION OF NONCOMPLIANCE:

On December 4 at approximately 1000 hours, while performing a 04C02 procedure, [redacted] observed a S Suspect hog had *condemned on antemortem* being stunned. Immediately adjacent to the condemned hog was a group of approximately 8 hogs passed for slaughter that were piled on top of one another. One hog within the pile was lying on the hip of the condemned hog. When the condemned hog was stunned, the pile of 8 hogs immediately began vocalizing using loud high-pitched squeals while jumping up and attempting to move off of each other. The operator of the stunner immediately stopped stunning, whereupon the vocalizations and

11. SIGNATURE OF INSPECTIO [redacted] DVM, MS

You are hereby advised of your rig *d/or 381.35 of 9 CFR*

12. PLANT MANAGEMENT RES [redacted]

13. PLANT MANAGEMENT RESPONSE *(further planned actions(s))*:

This document serves as written notification that your failure to comply with regulatory requirement(s) could result in additional regulatory or administrative action.

14. SIGNATURE OF PLANT MANAGEMENT	15. DATE
16. VERIFICATION SIGNATURE OF INSPECTION PROGRAM EMPLOYEE	17. DATE

FSIS FORM 5400-4 (7/98) Replaces FSIS Form 5400-4 (9/97), which may be used until exhausted.(7/98) DISTRIBUTION: Original & 1 copy - Establishment 1 copy - Inspector

s.(b)(6)
s.(b)(7)(C)

U.S. DEPARTMENT OF AGRICULTURE
FOOD SAFETY AND INSPECTION SERVICE

NONCOMPLIANCE RECORD CONTINUATION SHEET

TYPE OF NONCOMPLIANCE: [ ] Food Safety [X] Other Consumer Protection

1. DATE	2. RECORD NO.	3. ESTABLISHMENT NO.
12/4/2003	153-2003-6173	00244I M / 1

4. TO (*Name and Title*): Darrell Schmidt, Plant Manager

5. PERSONNEL NOTIFIED:

6. RELEVANT REGULATION(S): 9CFR313.30 (b)(1); HMSA sec. 1901

7. RELEVANT SECTION/PAGE OF ESTABLISHMENT PROCEDURE/PLAN	HACCP	SSOP	OTHER
			XX

8. ISP CODE	9. NONCOMPLIANCE INDICATOR
04C02	Product Protocol

10. DESCRIPTION OF NONCOMPLIANCE:

movements of the 8 hogs also stopped. The condemned hog was rendered insensible by the cardiac stunning method; allowed the hog to be shackled and humanely slaughtered. The US Suspect Pen was rejected (Tag No. B35944924). Yard Supervisor (who was present during the stunning) and Procurement Manager were immediately notified verbally of the noncompliance with humane handling requirements. The plant's immediate action was to discontinue the electrical (cardiac) stunning of suspect hogs. Instead, hogs would be stunned via captive bolt. The US Suspect Pen was released and the tag removed at the time of the response (approximately 1245 hours).

9 CFR 313.30 (b)(1) states: "It is necessary that the operator of electric current application equipment be skilled, attentive, and aware of his or her responsibility." Humane Methods of Slaughter Act of 1978, Sec. 1901 states: "...It is therefore declared to be the policy of the United States that the slaughtering of livestock and the handling of livestock in connection with slaughter shall be carried out only by humane methods."

The operator stunned the condemned hog without segregating the other hogs from it, thus causing the other hogs pain and/or discomfort as evidenced by the increased vocalizations and movement.

Failure to comply with regulatory requirements could result in additional regulatory or administrative action.

11. SIGNATURE OF INSPECTION: DVM, MS

15. DATE: 12-6-03

FSIS FORM 5400-4 (7/98)

-4 (9/97), which may be used until usted.(7/98)

DISTRIBUTION: Original & 1 copy - Establishment
1 copy - Inspector

s.(b)(6)
s.(b)(7)(C)

U.S. DEPARTMENT OF AGRICULTURE
FOOD SAFETY AND INSPECTION SERVICE

NONCOMPLIANCE RECORD

TYPE OF NONCOMPLIANCE: ☐ Food Safety ☒ Other Consumer Protecti

1. DATE	2. RECORD NO.	3. ESTABLISHMENT NO.
12/3/2003	195-2003-5471	00085B M / 1

4. TO (*Name and Title*): Larry Corbin, Regulatory Superintendent

5. PERSONNEL NOTIFIED:

6. RELEVANT REGULATION(S): 313.2

7. RELEVANT SECTION/PAGE OF ESTABLISHMENT PROCEDURE/PLAN	HACCP	SSOP	OTHER

8. ISF CODE: 04C02

9. NONCOMPLIANCE CLASSIFICATION INDICATORS

PLANT PROCESS	A. ☐ SSOP	☐ Monitoring	☐ Corrective Action	☐ Recordkeeping	☐ Implementation
	B. ☐ HACCP	☐ Monitoring	☐ Corrective Action	☐ Recordkeeping	☐ Plant Verification
C.	☒ PRODUCT	☐ Economic	☐ Misbranding	☒ Protocol	
D.	☐ FACILITY	☐ Lighting	☐ Structural	☐ Outside Premises	☐ Product Based
E.	☐ E. COLI	☐ Other			

10. DESCRIPTION OF NONCOMPLIANCE:

At approximately 1500 hours while performing HIMP antemortem verification procedures I observed approximately 50-60 hogs in the nonambulatory pen in the livestock barn awaiting stunning. I walked around the corner to the FS-3 suspect pen and observed approximately 15-20 hogs in the pen. The kill for the shift had ended. Supervisor was in the stunning area, and I asked why there were a large number of suspects left unprocessed at the end of the 10 hour shift. nformed me that they had been " short handed" and had only been able to kill 1 1/2 pens of suspects during the shift. Supervisor left the area after our

11. SIGNATURE OF INSPECTION PROGRAM EMPLOYEE

You are hereby advised of your right to appeal this decision as delineat

12. PLANT MANAGEMENT RESPONSE (*Immediate actions(s)*):

13. PLANT MANAGEMENT RESPONSE (*further planned actions(s)*):

This document serves as written notification that your failure to comply with regulatory requirement(s) could result in additional regulatory or administrative action.

14. SIGNATURE OF PLANT MANAGEMENT	15. DATE
16. VERIFICATION SIGNATURE OF INSPECTION PROGRAM EMPLOYEE	17. DATE

FSIS FORM 5400-6 (7/98) — Replaces FSIS Form 5400-6 (9/97), which may be used until exhausted.(7/98) — DISTRIBUTION: Original & 1 copy - Establishm 1 copy - Inspector

U.S. DEPARTMENT OF AGRICULTURE
FOOD SAFETY AND INSPECTION SERVICE

NONCOMPLIANCE RECORD CONTINUATION SHEET

TYPE OF NONCOMPLIANCE: ☐ Food Safety ☒ Other Consumer Protection

1. DATE	2. RECORD NO.	3. ESTABLISHMENT NO.
12/3/2003	195-2003-5471	00085B M / 1

4. TO (*Name and Title*): Larry Corbin, Regulatory Superintendent

5. PERSONNEL NOTIFIED:

6. RELEVANT REGULATION(S): 313.2

7. RELEVANT SECTION/PAGE OF ESTABLISHMENT PROCEDURE/PLAN	HACCP	SSOP	OTHER

8. ISP CODE	9. NONCOMPLIANCE INDICATOR
04C02	Product Protocol

10. DESCRIPTION OF NONCOMPLIANCE:

conversation. After left, I turned and observed a nonambulatory hog a short distance from where we had talked in the area between the irons leading to the CO2 chamber. I walked up to the area and observed approximately 6 hogs lying in the area. One hog was dead and the remainder were alive. One hog was in an agonal condition. It was cyanotic as evidenced by skin and mouth parts being a bluish purple color. It was lying on its side with its mouth open gasping for air as it breathed. The dying hog in this area had been left by the first shift supervisors and company employees at the end of their shift. The hogs had no water available to drink. I called on the radio to ask inspection personnel to locate Supervisor came to the area, and I showed the dying hog and informed of the noncompliance. Supervisor returned to thearea and stunned the agonal, dying hog with an electrical stunning device. Official regulatory control action was taken by application of FSIS Forms 6502-1, numbers B35521457 and B35521458, to the entrance of the CO2 chambers so that no more animals could be stunned. The establishment was allowed to stun and process the remainder of the suspect hogs subject to routine antemortem inspection procedures. At approximately 1735 I informed Plant Manager Steve Pirkle that I was suspending the assignment of inspectors for slaughter at 00085B M due to violations of the Humane Methods Of Slaughter Act. Since the notice of suspension held in abeyance, due to violations of the Humane Methods Of Slaughter Act, dated August 28, 2003, your establishment has been issued notification of noncompliance with the Humane Methods Of Slaughter Act on NR # 103-2003-5471and NR # 88-2003-5.

11. SIGNATURE OF INSPECTOR	12. DATE
	12-3-03

s.(b)(4)
s.(b)(6)
s.(b)(7)(C)

EXCEL
A Cargill Foods Company

December 4, 2003

This is Est. 85B's response to Noncompliance Record # 195-2003-5471:

Corrective Action: *(Immediate actions:)*

The dying animal was humanely killed and the two dead animals were properly disposed of through Excel's inedible dead animal handling procedures. The four remaining animals were humanely slaughtered at the beginning of second shift.

The two first shift Excel Supervisors, who are accountable for the processes in this area, were deemed negligent in their duties and are being disciplined in accordance with Excel policies.

Preventive Action: *(Further planned action (s)*

The area between the irons will not be considered as a live animal holding pen. The area between the irons will be void of unattended animals. This is inclusive of break time, lunchtime, and between the shifts. The animals intentionally removed from the irons and placed in this area will have their disposition initiated immediately and completed timely. The reason that water was not available in this area is that it is NOT a designated animal holding area, rather a drive alley area.

These procedures are effective December 4, 2003.

A designated management person will be assigned to patrol duty during operation's break time, lunchtime and between shifts time in the livestock area. The specific area of patrol will be in areas not designated as holding pens. This procedure is to assure the comfort of all the animals that are in the facility that are not specifically identified in our previously submitted humane handling verification plan and to assure all animals are being handled in accordance with the Humane Methods of Slaughter Act. Any deviation identified will be corrected immediately and the deviation will be documented on the sheet. If no deviations are identified during the patrol assignment period i.e. break time, or lunch time, or between shifts, the will be signed by the designated person as no deviations identified or corrected during that period of their tour duty. A verification function will be performed by Technical Services personnel at a minimum of

This procedure will be effective December 4, 2003.

The Humane-handling plan presented and implemented on August 28, 2003 has been effective in handling animals humanely with the exception of two incidents. One of the incidents is in the appeals process and the second incident has reached a resolution and has been incorporated into the humane handling plan. The failure to prevent inhumane handling of the animal on December 3, 2003 was not the result of plan failure, rather it was the result of improper execution of the plan by two employees. The individuals who failed in the execution of the plan have been removed from any animal handling responsibilities and are subject to further disciplinary action, pending an immediate investigation.

NR# 103-2003-5471 was noted in this Noncompliance Report has not been resolved and is in the appeal process beyond the IIC.

NR# 88-2003-5471 was noted in this Noncompliance has been resolved and the resolution signed off on by the IIC. No further NR's have been issued regarding the corrective action, therefore preventative measures have been effective.

Humane handling of livestock is a top priority and we are committed to meeting the regulatory standards.

Sincerely,

[redacted]

000122

General Manager

s.(b)(6)

s.(b)(7)(C)

compliance. 9CFR 304 and 9CFR 381. FORM APPROVED OMB NO. 0583-0089. OMB DISCLOSURE STATEMENT: Public reporting burden for this collection of information is estimated to average 7 minutes per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Department of Agriculture, Clearance Officer, OIRM, Room 404-W, Washington, D.C. 20250; and to the Office of Information and Regulatory Affairs, Office of Management and Budget.

U.S. DEPARTMENT OF AGRICULTURE
FOOD SAFETY AND INSPECTION SERVICE

NONCOMPLIANCE RECORD

TYPE OF NONCOMPLIANCE: ☐ Food Safety ☒ Other Consumer Protecti

1. DATE	2. RECORD NO.	3. ESTABLISHMENT NO.
11/24/2003	150-2003-6173	00244I M / 1

4. TO (*Name and Title*): Darrell Schmidt, Plant Manager

5. PERSONNEL NOTIFIED:

6. RELEVANT REGULATION(S): 9 CFR 313.2(b)

7. RELEVANT SECTION/PAGE OF ESTABLISHMENT PROCEDURE/PLAN	HACCP	SSOP	OTHER
			XX

8. ISP CODE: 04C02

9. NONCOMPLIANCE CLASSIFICATION INDICATORS

PLANT PROCESS	A. ☐ SSOP	☐ Monitoring	☐ Corrective Action	☐ Recordkeeping	☐ Implementation
	B. ☐ HACCP	☐ Monitoring	☐ Corrective Action	☐ Recordkeeping	☐ Plant Verification
C.	☒ PRODUCT	☐ Economic	☐ Misbranding	☒ Protocol	
D.	☐ FACILITY	☐ Lighting	☐ Structural	☐ Outside Premises	☐ Product Based
E.	☐ E. COLI	☐ Other			

10. DESCRIPTION OF NONCOMPLIANCE:

At approximately 1615 hours, while performing a 04C02 procedure, witnessed an animal handler strike a hog three times using a plastic "shaker" paddle brought down from just above shoulder height. The hog and animal handler were both standing on the south side of the tattoo chute within a group of approximately fifteen hogs, thus the hog being struck was unable to move. heard an increase in vocalization within the group of hogs at the time of the incident. had the handlers temporarily stop the driving of hogs through the tattoo chute and immediately notified Night Yard Supervisor of the inhumane

11. SIGNATURE OF INSPECTION PROG: DVM, MS

You are hereby advised of your right to appe *9 CFR*

12. PLANT MANAGEMENT RESPONSE (

13. PLANT MANAGEMENT RESPONSE *(further planned actions(s))*:

This document serves as written notification that your failure to comply with regulatory requirement(s) could result in additional regulatory or administrative action.

14. SIGNATURE OF PLANT MANAGEMENT	15. DATE
16. VERIFICATION SIGNATURE OF INSPECTION PROGRAM EMPLOYEE	17. DATE

FSIS FORM 5400-4 (7/98) — Replaces FSIS Form 5400-4 (9/97), which may be used until exhausted.(7/98) — DISTRIBUTION: Original & 1 copy - Establishment, 1 copy - Inspector

s.(b)(6)
s.(b)(7)(C)

U.S. DEPARTMENT OF AGRICULTURE
FOOD SAFETY AND INSPECTION SERVICE

NONCOMPLIANCE RECORD CONTINUATION SHEET

TYPE OF NONCOMPLIANCE: ☐ Food Safety ☒ Other Consumer Protection

1. DATE	2. RECORD NO.	3. ESTABLISHMENT NO.
11/24/2003	150-2003-6173	00244I M / 1

4. TO (*Name and Title*): Darrell Schmidt, Plant Manager

5. PERSONNEL NOTIFIED:

6. RELEVANT REGULATION(S): 9 CFR 313.2(b)

7. RELEVANT SECTION/PAGE OF ESTABLISHMENT PROCEDURE/PLAN	HACCP	SSOP	OTHER
			XX

8. ISP CODE	9. NONCOMPLIANCE INDICATOR
04C02	Product Protocol

10. DESCRIPTION OF NONCOMPLIANCE:

handling incident. When asked by [redacted] why the animal handler had struck the hog, the handler replied that "the hog was standing on [his] foot". [redacted] counseled the handler that "this was not a reason for hitting a hog hard" and that, should such an incident recur, the handler was to use other methods to move the hog (e.g. manually push the hog off) and/or call for assistance. [redacted] then allowed the handlers to resume moving hogs through the tattoo chute. The total time the tattoo chute was unavailable for use was approximately three minutes.

9 CFR 313.2 (b) states: "Electric prods, canvas slappers, or other implements employed to drive animals shall be used as little as possible in order to minimize excitement and injury. Any use of such implements which, in the opinion of the inspector, is excessive, is prohibited."

[redacted] was notified verbally and in writing of the failure to follow humane handling regulations. Failure to comply with regulatory requirements could result in additional regulatory or administrative action.

11. SIGNATURE OF INSPECTI [redacted] DVM, MS

15. DATE: 11-25-03

FSIS FORM 5400-4 (7/98) ...hich may be used until

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Chicago District

U.S. DEPARTMENT OF AGRICULTURE
FOOD SAFETY AND INSPECTION SERVICE

NONCOMPLIANCE RECORD

TYPE OF NONCOMPLIANCE: ☐ Food Safety ☒ Other Consumer Protecti

1. DATE	2. RECORD NO.	3. ESTABLISHMENT NO.
11/19/2003	2-2003-6150	07763 M / 1

4. TO (*Name and Title*): David A. Swanson, President/GM

5. PERSONNEL NOTIFIED:

6. RELEVANT REGULATION(S): 9 CFR Parts 313.1(a) and 313.2 (d)(1)

7. RELEVANT SECTION/PAGE OF ESTABLISHMENT PROCEDURE/PLAN	HACCP	SSOP	OTHER

8. ISP CODE: 04C02

9. NONCOMPLIANCE CLASSIFICATION INDICATORS

PLANT PROCESS A. ☐ SSOP	☐ Monitoring	☐ Corrective Action	☐ Recordkeeping	☐ Implementation
B. ☐ HACCP	☐ Monitoring	☐ Corrective Action	☐ Recordkeeping	☐ Plant Verification
C. ☒ PRODUCT	☐ Economic	☐ Misbranding	☒ Protocol	
D. ☐ FACILITY	☐ Lighting	☐ Structural	☐ Outside Premises	☐ Product Based
E. ☐ E. COLI	☐ Other			

10. DESCRIPTION OF NONCOMPLIANCE:

At approximately 8:30 am, I observed two non-ambulatory sows down in the unloading alleyway. Normal ambulatory sows were then unloaded directly into the alleyway with the two non-ambulatory (disabled) sows. The ambulatory sows were allowed to walk on and over one of the non-ambulatory sows that was lying in the middle of the alleyway. was notified and he immediately drove the normal ambulatory sows into a separate pen. Per CFR 313.2(d)(1), disabled animals shall be separated from normal ambulatory animals.

11. SIGNATURE OF INSPECT

You are hereby advised of your right to appeal this decision as delineated by 306.5 and/or 381.35 of 9 CFR

12. PLANT MANAGEMENT RESPONSE (*Immediate actions(s)*): PART #1 - SOWS WERE MOVED TO SUSPECT PEN ONE WENT UP THE CHUTE, #2 WAS KNOCKED AND STUCK IN PEN. PART #2 HOLES WERE REPAIRED WITH SHEET METAL.

13. PLANT MANAGEMENT RESPONSE (*further planned actions(s)*): SLAUGHTER FOREMAN AND QA REVIEWED CFR 313.2 ALL DISABLED ANIMALS WILL BE SEGREGATED IMMEDIATELY OR ROCKED AND STUCK BEFORE THE REMAINDER OF THE LOAD OR ANY LOADS THEREAFTER, ARE UNLOADED

This document serves as written notification that your failure to comply with regulatory requirement(s) could result in additional regulatory or administrative action.

14. SIGNATURE OF PLANT MANAGEMENT	15. DATE
Brian O Rollins	11-19-03
16. PROGRAM EMPLOYEE	17. DATE 11-20-03

FSIS ... previous editions FSIS Form 5400-4 (9/97), which may be used until exhausted.(7/98)

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s.(b)(6)
s.(b)(7)(C)

U.S. DEPARTMENT OF AGRICULTURE
FOOD SAFETY AND INSPECTION SERVICE

NONCOMPLIANCE RECORD CONTINUATION SHEET

TYPE OF NONCOMPLIANCE: ☐ Food Safety ☒ Other Consumer Protection

1. DATE	2. RECORD NO.	3. ESTABLISHMENT NO.
11/19/2003	2-2003-6150	07763 M / 1

4. TO (*Name and Title*): David A. Swanson, President/GM

5. PERSONNEL NOTIFIED:

6. RELEVANT REGULATION(S): 9 CFR Parts 313.1(a) and 313.2 (d)(1)

7. RELEVANT SECTION/PAGE OF ESTABLISHMENT PROCEDURE/PLAN	HACCP	SSOP	OTHER

8. ISP CODE	9. NONCOMPLIANCE INDICATOR
04C02	Product Protocol

10. DESCRIPTION OF NONCOMPLIANCE:

Additionally, a round hole with sharp jagged edges, approximately 10 inches in diameter, was observed on the lower portion of the metal panel separating the upper and lower unloading ramps. A small hole with jagged edges, approximately 3 inches in diameter was also observed in the lower portion of the right metal panel of the right lower unloading ramp

11. SIGNATURE OF INSPECTION PROGRAM EMPLOYEE	15. DATE
	11-19-03

FSIS FORM 5400-4 (7/98) Replaces FSIS Form 5400-4 (9/97), which may be used until exhausted.(7/98) DISTRIBUTION: Original & 1 copy - Establishment 1 copy - Inspector

s.(b)(6)

U.S. DEPARTMENT OF AGRICULTURE
FOOD SAFETY AND INSPECTION SERVICE

NONCOMPLIANCE RECORD

TYPE OF NONCOMPLIANCE s.(b)(7)(C)

☐ Food Safety ☒ Other Consumer Protection

1. DATE	2. RECORD NO.	3. ESTABLISHMENT NO.
10/17/03	130-2003-2602	00244I M / 1

4. TO (*Name and Title*)
Darrell Schmidt, Plant Manager

5. PERSONNEL NOTIFIED

6. RELEVANT REGULATION(S)
9 CFR 313.1(a)

7. RELEVANT SECTION/PAGE OF ESTABLISHMENT PROCEDURE/PLAN	HACCP	SSOP	OTHER
			n

8. ISP CODE 04C02

9. NONCOMPLIANCE CLASSIFICATION INDICATORS

PLANT PROCESS	A. ☐ SSOP	☐ Monitoring	☐ Corrective Action	☐ Recordkeeping	☐ Implementation
	B. ☐ HACCP	☐ Monitoring	☐ Corrective Action	☐ Recordkeeping	☐ Plant Verification
C.	☒ PRODUCT	☐ Economic	☐ Misbranding	☒ Protocol	
D.	☐ FACILITY	☐ Lighting	☐ Structural	☐ Outside Premises	☐ Product Based
E.	☐ E. COLI	☐ Other			

10. DESCRIPTION OF NONCOMPLIANCE:

At approximately 1130 hours, while performing an 04C02 procedure, [redacted] watched as an animal handler was attempting to remove a stressed hog from the North side of the "irons" drive chute. The handler opened the gate and the hog took several steps forward, whereupon its right rear leg dropped into an approximately 1.5 - 2 ft uncovered section of the floor gutter. This resulted in a 1.0 - 1.5 inch cut across the top of the right foot. Immediately after its leg fell into the gutter, the hog collapsed. The animal handler's immediate response was to retrieve spare grating and cover that portion of the gutter. [redacted] supervised the replacement of the grating; the gate was

11. SIGNATURE OF INSPECTION PR[redacted] DVM, MS

You are hereby advised of your right to appeal this decision as delineated by 306.5 and/or 381.35 of 9 CFR.

12. PLANT MANAGEMENT RESPONSE (*Immediate action(s)*):

13. PLANT MANAGEMENT RESPONSE (*further planned actions(s)*):

This document serves as written notification that your failure to comply with regulatory requirement(s) could result in additional regulatory or administrative action.

14. SIGNATURE OF PLANT MANAGEMENT	15. DATE
16. VERIFICATION SIGNATURE OF INSPECTION PROGRAM EMPLOYEE	17. DATE

FSIS FORM 5400-4 (7/98) Replaces FSIS Form 5400-4 (9/97), which may be used until exhausted.(7/98) DISTRIBUTION: Original & 1 copy - Establishment 1 copy - Inspector

s.(b)(6)
s.(b)(7)(C)

U.S. DEPARTMENT OF AGRICULTURE
FOOD SAFETY AND INSPECTION SERVICE

TYPE OF NONCOMPLIANCE
☐ Food Safety ☒ Other Consumer Protection

NONCOMPLIANCE RECORD CONTINUATION SHEET

1. DATE	2. RECORD NO.	3. ESTABLISHMENT NO.
10/17/03	130-2003-2602	00244I M / 1

4. TO (*Name and Title*)
Darrell Schmidt, Plant Manager

5. PERSONNEL NOTIFIED

6. RELEVANT REGULATION(S)
9 CFR 313.1(a)

7. RELEVANT SECTION/PAGE OF ESTABLISHMENT PROCEDURE/PLAN	HACCP	SSOP	OTHER
			n

8. ISP CODE	9. NONCOMPLIANCE INDICATOR
04C02	Product Protocol

10. DESCRIPTION OF NONCOMPLIANCE:

available for use at approximately 1150 hours.
In accordance with 9 CFR 313.1(a): "Livestock pens, driveways and ramps shall be maintained in good repair. ...unnecessary openings where the head, feet, or legs of an animal may be injured shall be repaired."
was shown the area of gutter and confirmed the deficiency. among others, was verbally informed of the violation of humane handling requirements. Failure to comply with regulatory requirements could result in additional regulatory or administrative action.

Past Similar NRs - Previous Ineffective Plant Actions: Failure to keep equipment and flooring in proper working order/repair.

NR: 101-2003 dated 8/15/03

11. SIGNATURE OF INSPECTION PRO

DVM, MS

15. DATE
10-18-03

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s.(b)(6)
s.(b)(7)(C)

NONCOMPLIANCE RECORD NUMBER 130-2003-2602

1) Identify and eliminate the cause of the deviation or deficiency.
[redacted] observed a handler remove a stressed hog from the drive chute, after the hog was removed from the drive chute it inadvertently walked one leg into an open drain trench, causing a small cut on the top of the right foot. The handler immediately retrieved a spare grating and installed it to prevent reoccurrence.
2) Establish measures to prevent reoccurrence.
The root cause of the deviation was a grate for the drain trench had broke, and fallen into the drain trench, leaving an open space. The broken grate was immediately replaced. The area supervisor or designee will monitor the area each day prior to start of operations to insure that the grates are intact and functional as intended. A meeting was held with area team members and instructed not release a hog from the drive chutes if grates are broken and or missing.

000129 3) Prevent distribution of product adulterated as a result of the deficiency.
No adulterated product resulted from the deficiencies listed in this NR.

s.(b)(6)
s.(b)(7)(C)

From:
Sent: Friday, October 24, 2003 8:31 PM
To:
Subject: RE: Humane handling NR

Thanks for the email. The hog was humanely slaughtered using captive bolt.

-----Original Message-----
From:
Sent: Wednesday, October 22, 2003 10:13 AM
To:
Subject: Humane handling NR

I received the fax copy of the NR you documented for a humane handling violation on 10/17. Thanks, The NR was very well written. However, what ever happened to the poor injured hog?

U.S. DEPARTMENT OF AGRICULTURE
FOOD SAFETY AND INSPECTION SERVICE

NONCOMPLIANCE RECORD

TYPE OF NONCOMPLIANCE: ☐ Food Safety ☒ Other Consumer Protecti

1. DATE	2. RECORD NO.	3. ESTABLISHMENT NO.
9/17/2003	103-2003-5471	00085B M / 1

4. TO (*Name and Title*): Larry Corbin, Regulatory Superintendent

5. PERSONNEL NOTIFIED:

6. RELEVANT REGULATION(S): 313.5 (a)(1 + 3)

7. RELEVANT SECTION/PAGE OF ESTABLISHMENT PROCEDURE/PLAN	HACCP	SSOP	OTHER

8. ISP CODE: 04C02

9. NONCOMPLIANCE CLASSIFICATION INDICATORS

PLANT PROCESS	A. ☐ SSOP	☐ Monitoring	☐ Corrective Action	☐ Recordkeeping	☐ Implementation	
	B. ☐ HACCP	☐ Monitoring	☐ Corrective Action	☐ Recordkeeping	☐ Plant Verification	
C.	☒ PRODUCT	☐ Economic	☐ Misbranding	☒ Protocol		
D.	☐ FACILITY	☐ Lighting	☐ Structural	☐ Outside Premises	☐ Product Based	
E.	☐ E. COLI	☐ Other				

10. DESCRIPTION OF NONCOMPLIANCE:

At approximately 0745 Inspector was performing inspection procedure 04C02 in the stunning area. observed several hogs kicking and gasping as they exited the CO2 chamber. Supervisor was in the area. notified of the unusual movements. Inspector observed no signs of consciousness such as rhythmic breathing, vocalizing, righting reflex or corneal reflex. returned to the USDA office and informed me of the unusual movements present in the normallymotionless animals. At approximately 0800 I walked to the stunning area. I observed a hog hanging on the bleed chain exhibiting a

11. SIGNATURE OF INSPECTION PROGRAM EMPLOY

You are hereby advised of your right to appeal this decision

12. PLANT MANAGEMENT RESPONSE *(Immediate acti*

13. PLANT MANAGEMENT RESPONSE *(further planned actions(s))*:

This document serves as written notification that your failure to comply with regulatory requirement(s) could result in additional regulatory or administrative action.

14. SIGNATURE OF PLANT MANAGEMENT	15. DATE
16. VERIFICATION SIGNATURE OF INSPECTION PROGRAM EMPLOYEE	17. DATE

FSIS FORM 5400-4 (7/98) Replaces FSIS Form 5400-4 (9/97), which may be used until exhausted.(7/98) DISTRIBUTION: Original & 1 copy - Establishment 1 copy - Inspector

s.(b)(4)
s.(b)(6)
s.(b)(7)(C)

U.S. DEPARTMENT OF AGRICULTURE
FOOD SAFETY AND INSPECTION SERVICE

NONCOMPLIANCE RECORD CONTINUATION SHEET

TYPE OF NONCOMPLIANCE: ☐ Food Safety ☒ Other Consumer Protection

1. DATE	2. RECORD NO.	3. ESTABLISHMENT NO.
9/17/2003	103-2003-5471	00085B M / 1

4. TO (*Name and Title*): Larry Corbin, Regulatory Superintendent

5. PERSONNEL NOTIFIED:

6. RELEVANT REGULATION(S): 313.5

7. RELEVANT SECTION/PAGE OF ESTABLISHMENT PROCEDURE/PLAN	HACCP	SSOP	OTHER

8. ISP CODE	9. NONCOMPLIANCE INDICATOR
04C02	Product Protocol

10. DESCRIPTION OF NONCOMPLIANCE:

righting reflex and gasping. I asked to contact establishment personnel to properly stun the hog. I asked to stop the stunning of hogs by tagging the entrance to the Approximately two minutes later operations manager, arrived at my location. questioned me concerning the hog's state of consciousness, as observed the ho g was only gasping at this point in time. I explained to that at the time of my first observation of the hog, it was exhibiting a righting reflex which is evidence of consciousness. tated that had observed this hog on the bleed chain approximately 20 yards prior to my observation point and saw only a limp unconscious animal. hen instructed the employee standing by to utilize the captive bolt device to stun the hog. I walked to the CO2 chamber area. I was told by Supervisor that the on the west side had not been used for a period of time today because it was not functioning properly. The on the east side was now not functioning properly. informed me that between 0730 and 0800 I became aware of the improperly functioning east as evidence by one hog on the shackle table showing signs of consciousness(i.e. blinking), and one hog on the shackle table that was actually conscious. told me that he stopped the stunning process when became aware of the improperly stunned animals. also told me that the CO2 levels had been at an acceptable level, never falling below . I asked if knew why the hogs were exhibiting signs of consciousness. told me that a hose had come off the manifold inside the unit causing it to function improperly. informed me that it had been repaired and the unit was now ready to be used. I was then contacted by Inspector He informed me that he observed a hung hog with a righting reflex at 0800. I asked Plant Manager Steve Pirkle for a preventative measure. assured me that the company was doing everything possible to correct the problem: however; he told me that because of the nature of machinery there would always be breakdowns. He informed me that he would place company personnel along the shackle table and along the length of the bleed chain to observe for signs of consciousness. He also stationed employees with electrical stunning devices and captive bolt s tunning devices in the area to be utilized if needed. I allowed the stunning process to resume. The first hogs stunned showed signs of consciousness. Company employees stopped the line and promptly stunned the animals with an electric stunner. The line was started and stopped many times due to company initiated restunning of hogs exiting the CO2 chamber. The company stopped stunning at approximately 1040 and did not resume until approximately 1230. At 1230 I observed unconscious hogs being processed.

11. SIGNATURE OF INSPECTION PROGRAM E

15. DATE 9/18/03

FSIS FORM 5400-4 (7/98)

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1 copy - Inspector

s.(b)(6)

The request for this information is Voluntary. It is needed to monitor defects found in the inspection system. It is used by FSIS to determine whether establishments are in compliance. 9CFR 320 and 9CFR 381. FORM APPROVED OMB NO. 0583-0089. OMB DISCLOSURE STATEMENT: Public reporting burden for this collection of information is estimated to average 7 minutes per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Department of Agriculture, Clearance Officer, OIRM, Room 404-W, Washington, D.C. 20250; and to the Office of Information and Regulatory Affairs, Office of Management and Budget.

s.(b)(7)(C)

U.S. DEPARTMENT OF AGRICULTURE
FOOD SAFETY AND INSPECTION SERVICE

NONCOMPLIANCE RECORD

TYPE OF NONCOMPLIANCE: ☐ Food Safety ☒ Other Consumer Protection

1. DATE	2. RECORD NO.	3. ESTABLISHMENT NO.
9/9/03	5-2003-2443	02926 M / 1

4. TO (*Name and Title*)	5. PERSONNEL NOTIFIED
Frank Faso, President/GM	Frank Faso

6. RELEVANT REGULATION(S): 313.30

7. RELEVANT SECTION/PAGE OF ESTABLISHMENT PROCEDURE/PLAN	HACCP	SSOP	OTHER
			64d

8. ISP CODE: 04C02

9. NONCOMPLIANCE CLASSIFICATION INDICATORS

PLANT PROCESS	A. ☐ SSOP	☐ Monitoring	☐ Corrective Action	☐ Recordkeeping	☐ *Implementation*
	B. ☐ HACCP	☐ Monitoring	☐ Corrective Action	☐ Recordkeeping	☐ Plant Verification
C.	☒ PRODUCT	☐ Economic	☐ Misbranding	☒ Protocol	
D.	☐ FACILITY	☐ *Lighting*	☐ Structural	☐ Outside Premises	☐ Product Based
E.	☐ E. COLI	☐ Other			

10. DESCRIPTION OF NONCOMPLIANCE:

While performing 04C02 inspection duties Inspector [redacted] and I observed a hog hanging from its back leg on the chain still conscious (kicking, squeeling and looking around) after it had been through the stunner. I stopped the line and informed Frank Faso.

11. SIGNATURE OF INSPECTION PROGRAM EMPLOYEE

You are hereby advised of your right to appeal this decision as delineated by 306.5 and/or 381.35 of 9 CFR.

12. PLANT MANAGEMENT RESPONSE *(Immediate actions(s))*:

See Attached

13. PLANT MANAGEMENT RESPONSE *(further planned actions(s))*:

See Attached

This document serves as written notification that your failure to comply with regulatory requirement(s) could result in additional regulatory or administrative action.

14. SIGNATURE OF PLANT MANAGEMENT	15. DATE
Frank Faso	9-30-03
[redacted] ION PROGRAM EMPLOYEE	17. DATE 9-30-03

Replaces FSIS Form 5400-4 (9/97), which may be used until exhausted.(7/98)

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s.(b)(4)
s.(b)(6)

Record No. 5-2003-2443

12. PLANT MANAGEMENT RESPONSE (Immediate actions(s)):

At 10:30 AM the employee in charge of sticking the hogs (after they have been stunned) noticed that one of the sows still showed signs of sensibility. The employee had the bleed chain stopped and he shot the sow in the head with a Assuming that the sow was now dead he had the sow shackled on to the bleed chain and had the bleed chain start up again. Before could stick the hog noticed that the hog was still showing signs of sensibility so without stopping the bleed chain the employee once again shot the sow in the head with the Now assuming that the sow was dead proceeded to stick the sow. But once again the own showed signs of sensibility. Without stopping the bleed chain (because the first priority was to render the sow dead to avoid any further suffering) the production manager Frank Faso himself shot the sow two more times in the head with the to finally kill the sow.

13. PLANT MANAGEMENT RESPONSE (Further planned actions(s)):

Afterwards the maintenance man checked the Amps of the stun gun to find out if a lack of Amps could have been the reason that the sow was not insensible after being stunned by the stun gun. The stun gun was producing 1.5 Amps. The criteria for the stun gun's Amps are between Amps. So a lack of Amps was not the reason. This particular sow was simply very difficult to kill. But our employees and plant manager acted accordingly (by our company procedure) to keep the animals suffering to a minimum.

Frank Faso

s.(b)(6)
s.(b)(7)(C)

U.S. DEPARTMENT OF AGRICULTURE
FOOD SAFETY AND INSPECTION SERVICE

NONCOMPLIANCE RECORD

TYPE OF NONCOMPLIANCE: ☐ Food Safety ☒ Other Consumer Protecti

1. DATE	2. RECORD NO.	3. ESTABLISHMENT NO.
8/29/2003	88-2003-5471	00085B M / 2

4. TO (*Name and Title*): Larry Corbin, Regulatory Superintendent

5. PERSONNEL NOTIFIED:

6. RELEVANT REGULATION(S): 313.2, 313.15 (a)(1) + (3)

7. RELEVANT SECTION/PAGE OF ESTABLISHMENT PROCEDURE/PLAN	HACCP	SSOP	OTHER

8. ISP CODE: 04C02

9. NONCOMPLIANCE CLASSIFICATION INDICATORS

PLANT PROCESS A. ☐ SSOP	☐ Monitoring	☐ Corrective Action	☐ Recordkeeping	☐ Implementation
PLANT PROCESS B. ☐ HACCP	☐ Monitoring	☐ Corrective Action	☐ Recordkeeping	☐ Plant Verification
C. ☒ PRODUCT	☐ Economic	☐ Misbranding	☒ Protocol	
D. ☐ FACILITY	☐ Lighting	☐ Structural	☐ Outside Premises	☐ Product Based
E. ☐ E. COLI	☐ Other			

10. DESCRIPTION OF NONCOMPLIANCE:

At approximately 1500 on 08/29/03, inspector and I were in the livestock unloading dock area observing establishment activities. At approximately 1530 we observed establishment employees stun several non-ambulatory hogs in the unloading dock area approximately 15 feet from our location. The employees stunned the animals using a penetrating captive bolt device. At approximately 1545 I walked to the unloading dock area where the hogs had been stunned. I observed the following in that area.1). Two establishment employees were standing, talking casually among several hogs. Some hogs were ambulatory, some hogs were dead. One hog was

11. SIGNATURE OF INSPECTION PROGRAM EMPLOYEE

You are hereby advised of your right to appeal this decision as delineated by 306.5 and/or 381.35 of 9 CFR.

12. PLANT MANAGEMENT RESPONSE (*Immediate actions(s)*):

13. PLANT MANAGEMENT RESPONSE (*further planned actions(s)*):

This document serves as written notification that your failure to comply with regulatory requirement(s) could result in additional regulatory or administrative action.

14. SIGNATURE OF PLANT MANAGEMENT	15. DATE
16. VERIFICATION SIGNATURE OF INSPECTION PROGRAM EMPLOYEE	17. DATE

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s.(b)(6)
s.(b)(7)(C)

U.S. DEPARTMENT OF AGRICULTURE
FOOD SAFETY AND INSPECTION SERVICE

NONCOMPLIANCE RECORD CONTINUATION SHEET

TYPE OF NONCOMPLIANCE
☐ Food Safety ☒ Other Consumer Protection

1. DATE	2. RECORD NO.	3. ESTABLISHMENT NO.
8/29/2003	88-2003-5471	00085B M / 2

4. TO (*Name and Title*)
Larry Corbin, Regulatory Superintendent

5. PERSONNEL NOTIFIED

6. RELEVANT REGULATION(S)
313.2, 313.15

7. RELEVANT SECTION/PAGE OF ESTABLISHMENT PROCEDURE/PLAN	HACCP	SSOP	OTHER

8. ISP CODE	9. NONCOMPLIANCE INDICATOR
04C02	Product Protocol

10. DESCRIPTION OF NONCOMPLIANCE:

down and conscious, as evidenced by blinking and rhythmic breathing. The down hog had blood running from it's nostrils and from it's head behind the right ear. As it lay in lateral recumbency, it's body trembled. Livestock manager [redacted] was in the area. I showed him the hog and asked him to have the hog restunned immediately. There wasn't an employee in the large unloading dock area that had any stunning device in their possession. In approximately 5 minutes, an employee brought a penetrating captive bolt stunning device to the area and I observed him properly stun the conscious animal. Regulatory control action was taken by stopping the stunning process at the butina entrance. Operations manager [redacted] gave the following preventive measures. 1) New penetrating captive bolt stunning devices will be available for use next week. 2) Employees will be trained in recognition of properly stunned animals. They will be instructed to stay with the stunned animals until they are certain that they are dead. 3) Gave assurance that any employee carrying out a stunning procedure will carry a back-up device as previously stated by the establishment. This back-up device will be used in case of malfunction of the first device. [redacted] was hopeful that in the future these preventive measures would prevent both mechanical and operator error. Productionwas allowed to resume. Kill floor down time was 18 minutes.

11. SIGNATURE OF INSPECTION PROGRAM EMPLOYEE	15. DATE
[redacted]	

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s.(b)(7)(C)

compliance. 9CFR 301 and 9CFR 381. FORM APPROVED OMB NO. 0583-0069. OMB DISCLOSURE STATEMENT: Public reporting burden for this collection of information is estimated to average 7 minutes per response, including the time for reviewing instructions, searching existing data soures, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Department of Agriculture, Clearance Officer, OIRM, Room 404-W, Washington, D.C. 20250; and to the Office of Information and Regulatory Affairs, Office of Management and Budget.

U.S. DEPARTMENT OF AGRICULTURE
FOOD SAFETY AND INSPECTION SERVICE

NONCOMPLIANCE RECORD

TYPE OF NONCOMPLIANCE: [ ] Food Safety [X] Other Consumer Protecti

1. DATE	2. RECORD NO.	3. ESTABLISHMENT NO.
8/26/2003	81-2003-5471	00085B M / 2

4. TO (*Name and Title*): Larry Corbin, Regulatory Superintendent

5. PERSONNEL NOTIFIED:

6. RELEVANT REGULATION(S): 313.2(a)

7. RELEVANT SECTION/PAGE OF ESTABLISHMENT PROCEDURE/PLAN	HACCP	SSOP	OTHER

8. ISP CODE: 04C02

9. NONCOMPLIANCE CLASSIFICATION INDICATORS

PLANT PROCESS	A. [ ] SSOP	[ ] Monitoring	[ ] Corrective Action	[ ] Recordkeeping	[ ] Implementation
	B. [ ] HACCP	[ ] Monitoring	[ ] Corrective Action	[ ] Recordkeeping	[ ] Plant Verification
C.	[X] PRODUCT	[ ] Economic	[ ] Misbranding	[X] Protocol	
D.	[ ] FACILITY	[ ] Lighting	[ ] Structural	[ ] Outside Premises	[ ] Product Based
E.	[ ] E. COLI	[ ] Other			

10. DESCRIPTION OF NONCOMPLIANCE:

At approximately 1620 on August 26, 2003 I observed a non-ambulatory hog lying in an unloading dock. Two hogs that had been previously unloaded re-entered the truck. The truck driver was in the truck dragging dead hogs to the side door and pushing them out of the truck. The truck driver saw the two hogs re-enter the truck and he drove the hogs back down the ramp. One of the hogs ran over the non-ambulatory hog as it was being driven from the truck. The truck driver in the adjacent dock ran to stop the hog from being run over.
was unable to stop the hog. I told the truck driver to stop unloading his truck until establishment employees

11. SIGNATURE OF INSPECTION PROGRAM EMPLOYEE

You are hereby advised of your right to appeal this decision as delineated

12. PLANT MANAGEMENT RESPONSE (*Immediate actions(s)*):

13. PLANT MANAGEMENT RESPONSE (*further planned actions(s)*):

This document serves as written notification that your failure to comply with regulatory requirement(s) could result in additional regulatory or administrative action.

14. SIGNATURE OF PLANT MANAGEMENT	15. DATE
16. VERIFICATION SIGNATURE OF INSPECTION PROGRAM EMPLOYEE	17. DATE

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s.(b)(6)
s.(b)(7)(C)

U.S. DEPARTMENT OF AGRICULTURE
FOOD SAFETY AND INSPECTION SERVICE

NONCOMPLIANCE RECORD CONTINUATION SHEET

TYPE OF NONCOMPLIANCE: ☐ Food Safety ☒ Other Consumer Protection

1. DATE	2. RECORD NO.	3. ESTABLISHMENT NO.
8/26/2003	81-2003-5471	00085B M / 2

4. TO (*Name and Title*): Larry Corbin, Regulatory Superintendent

5. PERSONNEL NOTIFIED:

6. RELEVANT REGULATION(S): 313.2(a)

7. RELEVANT SECTION/PAGE OF ESTABLISHMENT PROCEDURE/PLAN	HACCP	SSOP	OTHER

8. ISP CODE	9. NONCOMPLIANCE INDICATOR
04C02	Product Protocol

10. DESCRIPTION OF NONCOMPLIANCE:

removed the non-ambulatory hog from the area. I notified [redacted] of the noncompliance. I told [redacted] that I would suspend stunning at this time. I walked to the stunning area and told the establishment employees to stop driving hogs into the CO2 chambers. The entrances to the CO2 chambers were rejected with tag numbers B35521167 and B355211168 at 1630. The Chicago District Office was notified of the noncompliance. I met with operations manager [redacted] to discuss the noncompliance.
Similar noncompliance was documented on NR 80-2003-5471 dated 8/25/2003.

11. SIGNATURE OF INSPECTION PROGI [redacted]

15. DATE 8/26/03

FSIS FORM 5400-4 (7/98)

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1 copy - Inspector

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Compliance: 9CFR 301 and 9CFR 381. FORM APPROVED OMB NO. 0583-0089. OMB DISCLOSURE STATEMENT: Public reporting burden for this collection of information is estimated to average 7 minutes per response, including the time for reviewing instructions, searching existing data soures, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, inluding suggestions for reducing this burden, to Department of Agriculture, Clearance Officer, OIRM, Room 404-W, Washington, D.C. 20250; and to the Office of Information and Regulatory Affairs, Office of Management and Budget.

U.S. DEPARTMENT OF AGRICULTURE
FOOD SAFETY AND INSPECTION SERVICE

NONCOMPLIANCE RECORD

TYPE OF NONCOMPLIANCE: [ ] Food Safety [X] Other Consumer Protecti

1. DATE	2. RECORD NO.	3. ESTABLISHMENT NO.
8/25/2003	80-2003-5471	00085B M / 1

4. TO (*Name and Title*): Larry Corbin, Regulatory Superintendent

5. PERSONNEL NOTIFIED:

6. RELEVANT REGULATION(S): 313.2(a)

7. RELEVANT SECTION/PAGE OF ESTABLISHMENT PROCEDURE/PLAN	HACCP	SSOP	OTHER

8. ISP CODE: 04C02

9. NONCOMPLIANCE CLASSIFICATION INDICATORS

PLANT PROCESS	A. [ ] SSOP	[ ] Monitoring	[ ] Corrective Action	[ ] Recordkeeping	[ ] Implementation
	B. [ ] HACCP	[ ] Monitoring	[ ] Corrective Action	[ ] Recordkeeping	[ ] Plant Verificatio
C.	[X] PRODUCT	[ ] Economic	[ ] Misbranding	[X] Protocol	
D.	[ ] FACILITY	[ ] Lighting	[ ] Structural	[ ] Outside Premises	[ ] Product Based
E.	[ ] E. COLI	[ ] Other			

10. DESCRIPTION OF NONCOMPLIANCE:

At approximately 0925 on August 25, 2003 I observed a non-ambulatory hog lying in an unloading dock. Hogs were being driven from the truck. Many hogs were walking and running on top of the down hog. I stopped the truck driver from unloading the truck. I notified inspector of the noncompliance and asked to go to the stunning area and stop the stunning process. I notified company supervisor of the noncompliance and of the tagging of the CO2 entrances. A company employee stunned the non-ambulatory hog using a captive bolt gun. Plant manager Steve Pirkle gave the following preventative measures: 1) Install video

11. SIGNATURE OF INSPECTION PROGRAM EMPLOYEE

You are hereby advised of your right to appeal this decision as delineated by 306.

12. PLANT MANAGEMENT RESPONSE *(Immediate actions(s))*:

13. PLANT MANAGEMENT RESPONSE *(further planned actions(s))*:

This document serves as written notification that your failure to comply with regulatory requirement(s) could result in additional regulatory or administrative action.

14. SIGNATURE OF PLANT MANAGEMENT	15. DATE
16. VERIFICATION SIGNATURE OF INSPECTION PROGRAM EMPLOYEE	17. DATE

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U.S. DEPARTMENT OF AGRICULTURE
FOOD SAFETY AND INSPECTION SERVICE

NONCOMPLIANCE RECORD CONTINUATION SHEET

TYPE OF NONCOMPLIANCE
☐ Food Safety ☒ Other Consumer Protecti

1. DATE	2. RECORD NO.	3. ESTABLISHMENT NO.
8/25/2003	80-2003-5471	00085B M / 1

4. TO (*Name and Title*)
Larry Corbin, Regulatory Superintendent

5. PERSONNEL NOTIFIED

6. RELEVANT REGULATION(S)
313.2(a)

7. RELEVANT SECTION/PAGE OF ESTABLISHMENT PROCEDURE/PLAN	HACCP	SSOP	OTHER

8. ISP CODE	9. NONCOMPLIANCE INDI CATOR
04C02	Product Protocol

10. DESCRIPTION OF NONCOMPLIANCE:

cameras in the unloading docks 2) Monitor and verify truck drivers in the unloading process 3) Require a sign off sheet for all truck drivers stating that they understand and have been trained in humane handling practices. 4) Instruct all livestock handling employees to remove or stun any non-ambulatory hogs when they first become aware of their presence. Kill floor down time as a result of this noncompliance was approximately 1 hour.

11. SIGNATURE OF INSPECTION PROGRAM EMPLOYEE	15. DATE

FSIS FORM 5400-4 (7/98) Replaces FSIS Form 5400-4 (9/97), which may be used until exhausted.(7/98)

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FOOD SAFETY AND INSPECTION SERVICE

NONCOMPLIANCE RECORD

TYPE OF NONCOMPLIANCE

☐ Food Safety ☒ Other Consumer Protecti

1. DATE	2. RECORD NO.	3. ESTABLISHMENT NO.
8/20/2003	75-2003-5471	00085B M / 1

4. TO (*Name and Title*)
Larry Corbin, Regulatory Superintendent

5. PERSONNEL NOTIFIED

6. RELEVANT REGULATION(S)
313.1a 313.2

7. RELEVANT SECTION/PAGE OF ESTABLISHMENT PROCEDURE/PLAN	HACCP	SSOP	OTHER

8. ISP CODE 04C02

9. NONCOMPLIANCE CLASSIFICATION INDICATORS

PLANT PROCESS	A. ☐ SSOP	☐ Monitoring	☐ Corrective Action	☐ Recordkeeping	☐ Implementation
	B. ☐ HACCP	☐ Monitoring	☐ Corrective Action	☐ Recordkeeping	☐ Plant Verification
C.	☒ PRODUCT	☐ Economic	☐ Misbranding	☒ Protocol	
D.	☐ FACILITY	☐ Lighting	☐ Structural	☐ Outside Premises	☐ Product Based
E.	☐ E. COLI	☐ Other			

10. DESCRIPTION OF NONCOMPLIANCE:

At 0615 I observed a hog with it's head stuck in an opening of a sorting gate in pen #18 - 22. I notified establishment employee of the problem. stated that there was no easy way to remove the hog from the gate. then proceeded to try forcefully, numerous times, to ram the hogs head back through the gate with his foot. I told o stop. then said was going to get the stunner. While I was waiting for to come back, another employee walked up and grabbed the hog by it's back legs and turned the hog on it's side. This action released the hog's head from the opening in the sorting gate. I notified

11. SIGNATURE OF INSPECTION PROGRAM EMPLOYEE

You are hereby advised of your right to appeal this decision as delineated by 306.5 and/or 381.35 of 9 CFR.

12. PLANT MANAGEMENT RESPONSE *(Immediate actions(s))*:

13. PLANT MANAGEMENT RESPONSE *(further planned actions(s))*:

This document serves as written notification that your failure to comply with regulatory requirement(s) could result in additional regulatory or administrative action.

14. SIGNATURE OF PLANT MANAGEMENT	15. DATE

16. VERIFICATION SIGNATURE OF INSPECTION PROGRAM EMPLOYEE	17. DATE

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U.S. DEPARTMENT OF AGRICULTURE
FOOD SAFETY AND INSPECTION SERVICE

NONCOMPLIANCE RECORD CONTINUATION SHEET

TYPE OF NONCOMPLIANCE
☐ Food Safety ☒ Other Consumer Protection

1. DATE	2. RECORD NO.	3. ESTABLISHMENT NO.
8/20/2003	75-2003-5471	00085B M / 1

4. TO (*Name and Title*)
Larry Corbin, Regulatory Superintendent

5. PERSONNEL NOTIFIED

6. RELEVANT REGULATION(S)
313.1a 313.2

7. RELEVANT SECTION/PAGE OF ESTABLISHMENT PROCEDURE/PLAN	HACCP	SSOP	OTHER

8. ISP CODE	9. NONCOMPLIANCE INDICATOR
04C02	Product Protocol

10. DESCRIPTION OF NONCOMPLIANCE:

of the noncompliance. I returned to the government office and notified and I immediately contacted and met with and to discuss a preventive measure.

11. SIGNATURE OF INSPECTION PROGRAM EMPLOYEE	15. DATE

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U.S. DEPARTMENT OF AGRICULTURE
FOOD SAFETY AND INSPECTION SERVICE

NONCOMPLIANCE RECORD

TYPE OF NONCOMPLIANCE: ☐ Food Safety ☒ Other Consumer Protecti

1. DATE	2. RECORD NO.	3. ESTABLISHMENT NO.
8/19/2003	73-2003-5471	00085B M / 1

4. TO (*Name and Title*): Larry Corbin, Regulatory Superintendent

5. PERSONNEL NOTIFIED:

6. RELEVANT REGULATION(S): 313.30

7. RELEVANT SECTION/PAGE OF ESTABLISHMENT PROCEDURE/PLAN	HACCP	SSOP	OTHER

8. ISP CODE: 04C02

9. NONCOMPLIANCE CLASSIFICATION INDICATORS

PLANT PROCESS	A. ☐ SSOP	☐ Monitoring	☐ Corrective Action	☐ Recordkeeping	☐ Implementation	
	B. ☐ HACCP	☐ Monitoring	☐ Corrective Action	☐ Recordkeeping	☐ Plant Verification	
C.	☒ PRODUCT	☐ Economic	☐ Misbranding	☒ Protocol		
D.	☐ FACILITY	☐ Lighting	☐ Structural	☐ Outside Premises	☐ Product Based	
E.	☐ E. COLI	☐ Other				

10. DESCRIPTION OF NONCOMPLIANCE:

At 10:15 and I observed a plant employee applying an electrical stunning device to a hog. The employee applied the device in such a manner that the quality and location of the electrical shock did not produce immediate insensibility to pain. The hog jumped and squealed upon each incorrect application of the electrical shock. informed supervisor of the non-compliance. Production was stopped by rejecting entrance to the butinas using tags numbered B35521146 and B35521147. During a meeting with and a preventative measure was discussed. The decision was made to properly restrain hogs

11. SIGNATURE OF INSPECTION PROGRAM EMPLOYEE

You are hereby advised of your right to appeal this decision as delineated by 306.5 and/or 381.35 of 9 CFR.

12. PLANT MANAGEMENT RESPONSE *(Immediate actions(s))*:

13. PLANT MANAGEMENT RESPONSE *(further planned actions(s))*:

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14. SIGNATURE OF PLANT MANAGEMENT	15. DATE
16. VERIFICATION SIGNATURE OF INSPECTION PROGRAM EMPLOYEE	17. DATE

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U.S. DEPARTMENT OF AGRICULTURE
FOOD SAFETY AND INSPECTION SERVICE

NONCOMPLIANCE RECORD CONTINUATION SHEET

TYPE OF NONCOMPLIANCE
☐ Food Safety ☒ Other Consumer Protection

1. DATE	2. RECORD NO.	3. ESTABLISHMENT NO.
8/19/2003	73-2003-5471	00085B M / 1

4. TO (*Name and Title*)
Larry Corbin, Regulatory Superintendent

5. PERSONNEL NOTIFIED

6. RELEVANT REGULATION(S)
313.30

7. RELEVANT SECTION/PAGE OF ESTABLISHMENT PROCEDURE/PLAN	HACCP	SSOP	OTHER

8. ISP CODE	9. NONCOMPLIANCE INDICATOR
04C02	Product Protocol

10. DESCRIPTION OF NONCOMPLIANCE:

prior to application of the electrical stunning device. After reviewing the preventative measure, production was allowed to resume. A similar NR numbered 26-2003-4036 was documented on 6/4/03. The previous preventative action has not been effective. Failure to meet regulatory requirements could result in further enforcement actions.

11. SIGNATURE OF INSPECTION PROGRAM EMPLOYEE	15. DATE

FSIS FORM 5400-4 (7/98) Replaces FSIS Form 5400-4 (9/97), which may be used until exhausted.(7/98) DISTRIBUTION: Original & 1 copy - Establishment 1 copy - Inspector

The request for this information is Voluntary. It is needed to monitor defects found in this inspection system. It is used by FSIS to determine whether establishments are in compliance. 9CFR 301 and 9CFR 381. FORM APPROVED OMB NO. 0583-0089. OMB DISCLOSURE STATEMENT: Public reporting burden for this collection of information is estimated to average 7 minutes per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Department of Agriculture, Clearance Officer, OIRM, Room 404-W, Washington, D.C. 20250; and to the Office of Information and Regulatory Affairs, Office of Management and Budget.

U.S. DEPARTMENT OF AGRICULTURE
FOOD SAFETY AND INSPECTION SERVICE

NONCOMPLIANCE RECORD

TYPE OF NONCOMPLIANCE: ☐ Food Safety ☒ Other Consumer Protecti

1. DATE	2. RECORD NO.	3. ESTABLISHMENT NO.
8/18/2003	72-2003-5471	00085B M / 1

4. TO (*Name and Title*): Larry Corbin, Regulatory Superintendent

5. PERSONNEL NOTIFIED:

6. RELEVANT REGULATION(S): 313.2e

7. RELEVANT SECTION/PAGE OF ESTABLISHMENT PROCEDURE/PLAN	HACCP	SSOP	OTHER

8. ISP CODE: 04C02

9. NONCOMPLIANCE CLASSIFICATION INDICATORS

PLANT PROCESS	A. ☐ SSOP	☐ Monitoring	☐ Corrective Action	☐ Recordkeeping	☐ Implementation	
	B. ☐ HACCP	☐ Monitoring	☐ Corrective Action	☐ Recordkeeping	☐ Plant Verification	
C.	☒ PRODUCT	☐ Economic	☐ Misbranding	☒ Protocol		
D.	☐ FACILITY	☐ Lighting	☐ Structural	☐ Outside Premises	☐ Product Based	
E.	☐ E. COLI	☐ Other				

10. DESCRIPTION OF NONCOMPLIANCE:

At 0715, and I observed the suspect pen, full of suspects, without any water available to drink. notified of the problem.

11. SIGNATURE OF INSPECTION PROGRAM EMPLOYEE

You are hereby advised of your right to appeal this decision as delineated by 306.5 and/or 381.35 of 9 CFR.

12. PLANT MANAGEMENT RESPONSE *(Immediate actions(s))*:

13. PLANT MANAGEMENT RESPONSE *(further planned actions(s))*:

This document serves as written notification that your failure to comply with regulatory requirement(s) could result in additional regulatory or administrative action.

14. SIGNATURE OF PLANT MANAGEMENT	15. DATE

16. VERIFICATION SIGNATURE OF INSPECTION PROGRAM EMPLOYEE	17. DATE

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U.S. DEPARTMENT OF AGRICULTURE
FOOD SAFETY AND INSPECTION SERVICE

NONCOMPLIANCE RECORD

TYPE OF NONCOMPLIANCE: ☐ Food Safety ☒ Other Consumer Protection

1. DATE	2. RECORD NO.	3. ESTABLISHMENT NO.
8/15/03	101-2003-2602	00244I M / 1

4. TO (*Name and Title*): Darrell Schmidt, Plant Manager

5. PERSONNEL NOTIFIED:

6. RELEVANT REGULATION(S): 9 CFR 313, 500.2(a)(4), 500.(3)(b)

7. RELEVANT SECTION/PAGE OF ESTABLISHMENT PROCEDURE/PLAN	HACCP	SSOP	OTHER
			XX

8. ISP CODE: 04C02

9. NONCOMPLIANCE CLASSIFICATION INDICATORS

PLANT PROCESS	A. ☐ SSOP	☐ Monitoring	☐ Corrective Action	☐ Recordkeeping	☐ Implementation	
	B. ☐ HACCP	☐ Monitoring	☐ Corrective Action	☐ Recordkeeping	☐ Plant Verification	
C.	☒ PRODUCT	☐ Economic	☐ Misbranding	☒ Protocol		
D.	☐ FACILITY	☐ Lighting	☐ Structural	☐ Outside Premises	☐ Product Based	
E.	☐ E. COLI	☐ Other				

10. DESCRIPTION OF NONCOMPLIANCE:

At approximately 1155 hours while in the stick area, IIC, observed a hog move behind the company person stunning hogs then fall and/or jump from the stun area platform to the cement floor, a distance of approximately 4 vertical feet. Upon falling, the hog's back feet became tangled in a nearby yellow hose. After disentangling itself, it stood and was walked back to the drive alley. Per 9 CFR 500, stopped the stunning of any additional hogs until provided with immediate corrective action and further planned preventive actions. Superintendent, was notified, among others, of the violation of humane handling requirements. Failure to comply with

11. SIGNATURE OF INSPECT: DMM

You are hereby advised of your r... 1.35 of 9 CFR

12. PLANT MANAGEMENT RESPONSE (*Immediate actions(s)*):

13. PLANT MANAGEMENT RESPONSE (*further planned actions(s)*):

This document serves as written notification that your failure to comply with regulatory requirement(s) could result in additional regulatory or administrative action.

14. SIGNATURE OF PLANT MANAGEMENT	15. DATE
16. VERIFICATION SIGNATURE OF INSPECTION PROGRAM EMPLOYEE	17. DATE

FSIS FORM 5400-4 (7/98) Replaces FSIS Form 5400-4 (9/97), which may be used until exhausted.(7/98) DISTRIBUTION: Original & 1 copy - Establishment 1 copy - Inspector

U.S. DEPARTMENT OF AGRICULTURE
FOOD SAFETY AND INSPECTION SERVICE

NONCOMPLIANCE RECORD CONTINUATION SHEET

TYPE OF NONCOMPLIANCE
☐ Food Safety ☒ Other Consumer Protection

1. DATE	2. RECORD NO.	3. ESTABLISHMENT NO.
8/15/03	101-2003-2602	00244I M / I

4. TO (*Name and Title*)
Darrell Schmidt, Plant Manager

5. PERSONNEL NOTIFIED

6. RELEVANT REGULATION(S)
9 CFR 313, 500.2(a)(4), 500.(3)(b)

7. RELEVANT SECTION/PAGE OF ESTABLISHMENT PROCEDURE/PLAN	HACCP	SSOP	OTHER
			XX

8. ISP CODE	9. NONCOMPLIANCE INDICATOR
04C02	Product Protocol

10. DESCRIPTION OF NONCOMPLIANCE:

regulatory requirements could result in additional regulatory or administrative action. (79-2003-2602, 07/03/2003)

11. SIGNATURE OF INSPECTION PROGRAM EMPLOYEE	15. DATE

FSIS FORM 5400-4 (7/98) Replaces FSIS Form 5400-4 (9/97), which may be used until exhausted.(7/98) DISTRIBUTION: Original & 1 copy - Establishment 1 copy - Inspector

NONCOMPLIANCE RECORD NUMBER 101-2003-2602

1. **Identify and eliminate the cause of the deviation.**
   The root cause was identified as a hog entered the drive alley backwards; the drivers opened a side gate to allow the hog out of the drive alley, after which the hog inadvertently jumped from the stunner platform to the floor. The hog was not injured as a result and freely walked the immediate area on its own.
2. **Establish measures to prevent reoccurrence.**
   The gate between the drivers and the stunners was welded shut the same day of the incident to prevent reoccurrence.
3. **Prevent distribution of product adulterated as a result of the deviation.**
   No product was adulterated as a result of the deficiency listed in this NR.

30-620-7599 Copy faxed to [redacted]

The request for this information is Voluntary. It is needed to monitor defects found in this inspection system. It is used by FSIS to determine whether establishments are in compliance. 9CFR 301 and 9CFR 381. FORM APPROVED OMB NO. 0583-0089. OMB DISCLOSURE STATEMENT: Public reporting burden for this collection of information is estimated to average 7 minutes per response, including the time for reviewing instructions, searching existing data soures, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, inluding suggestions for reducing this burden, to Department of Agriculture, Clearance Officer, OIRM, Room 404-W, Washington, D.C. 20250; and to the Office of Information and Regulatory Affairs, Office of Management and Budget.

U.S. DEPARTMENT OF AGRICULTURE
FOOD SAFETY AND INSPECTION SERVICE

NONCOMPLIANCE RECORD

TYPE OF NONCOMPLIANCE: ☐ Food Safety ☒ Other Consumer Protecti

1. DATE	2. RECORD NO.	3. ESTABLISHMENT NO.
7/31/2003	25-2003-5263	01851 M / 1

4. TO (Name and Title)	5. PERSONNEL NOTIFIED
David Follenweider, V.P.	David Follenweider

6. RELEVANT REGULATION(S): 313.1(a)

7. RELEVANT SECTION/PAGE OF ESTABLISHMENT PROCEDURE/PLAN	HACCP	SSOP	OTHER
			MPI Regs. pg 138

8. ISP CODE: 04C02

9. NONCOMPLIANCE CLASSIFICATION INDICATORS

PLANT PROCESS A. ☐ SSOP	☐ Monitoring	☐ Corrective Action	☐ Recordkeeping	☐ Implementation
B. ☐ HACCP	☐ Monitoring	☐ Corrective Action	☐ Recordkeeping	☐ Plant Verification
C. ☒ PRODUCT	☐ Economic	☐ Misbranding	☒ Protocol	
D. ☐ FACILITY	☐ Lighting	☐ Structural	☐ Outside Premises	☐ Product Based
E. ☐ E. COLI	☐ Other			

10. DESCRIPTION OF NONCOMPLIANCE:

While conducting an unscheduled 04C02 on 07/31/03 in the livestock pens I noticed that the concrete curbing in the outdoor pen is broken with jagged edges. This poses an injury hazard to the calves feet and other areas of the body especially if they are forced to lie down on the broken concrete. A U.S. Rejected tag has been applied to the outdoor pen to prevent it's use until it is repaired. As the above Regulation states the livestock pens have to be constructed and maintained in good repair to prevent injury to the animals and maintain compliance with the Humane Slaughter laws.

11. SIGNATURE OF INSPECTION [redacted]

You are hereby advised of your right t[redacted]

12. PLANT MANAGEMENT RESPONSE (Immediate actions(s)): CONCRETE CURBING WILL BE REMOVED

13. PLANT MANAGEMENT RESPONSE (further planned actions(s)): PLANT WILL REVIEW SPACE AND DETERMINE IF NEW CURBING IS NEEDED

This document serves as written notification that your failure to comply with regulatory requirement(s) could result in additional regulatory or administrative action.

14. SIGNATURE OF PLANT MANAGEMENT [redacted] 15. DATE 7-31-03

16. VERIFICATI[redacted] 17. DATE 8/4/03

FSIS FORM 5400 [illegible] used until exhausted.(7/98) DISTRIBUTION: Original & 1 copy - Establishment

s.(b)(6) s.(b)(7)(C)

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U.S. DEPARTMENT OF AGRICULTURE
FOOD SAFETY AND INSPECTION SERVICE

NONCOMPLIANCE RECORD

TYPE OF NONCOMPLIANCE: [ ] Food Safety [X] Other Consumer Protecti

1. DATE	2. RECORD NO.	3. ESTABLISHMENT NO.
7/28/2003	14-2003-5313	18229 M / 1

4. TO (*Name and Title*)	5. PERSONNEL NOTIFIED
Nick Simov, President/GM	Nick Simov

6. RELEVANT REGULATION(S)
390.3

7. RELEVANT SECTION/PAGE OF ESTABLISHMENT PROCEDURE/PLAN	HACCP	SSOP	OTHER

8. ISP CODE 04C02

9. NONCOMPLIANCE CLASSIFICATION INDICATORS

PLANT PROCESS A. [ ] SSOP	[ ] Monitoring	[ ] Corrective Action	[ ] Recordkeeping	[ ] Implementation
PLANT PROCESS B. [ ] HACCP	[ ] Monitoring	[ ] Corrective Action	[ ] Recordkeeping	[ ] Plant Verification
C. [X] PRODUCT	[ ] Economic	[ ] Misbranding	[X] Protocol	
D. [ ] FACILITY	[ ] Lighting	[ ] Structural	[ ] Outside Premises	[ ] Product Based
E. [ ] E. COLI	[ ] Other			

10. DESCRIPTION OF NONCOMPLIANCE:

At approximatly11:05a.m. while performing 04c02 I observed the following deficiency a hog that was hung and stuck but was still breathing. I touched the hogs eye and it blinked. I stopped production notified Nick and of the problem. This is similar in reference to NR# 12-2003-5313 dated 7/24/2003.

11. SIGNATURE OF INSPECTION PROGRAM EMPLOYEE

You are hereby advised of your right to appeal this decision as delineated by 306.5 and/or 381.35 of 9 CFR.

12. PLANT MANAGEMENT RESPONSE *(Immediate actions(s))*:

13. PLANT MANAGEMENT RESPONSE *(further planned actions(s))*:

This document serves as written notification that your failure to comply with regulatory requirement(s) could result in additional regulatory or administrative action.

14. SIGNATURE OF PLANT MANAGEMENT	15. DATE
16. VERIFICATION SIGNATURE OF INSPECTION PROGRAM EMPLOYEE	17. DATE

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compliance. 9CFR 301 and 9CFR 381. FORM APPROVED OMB NO. 0583-0089. OMB DISCLOSURE STATEMENT: Public reporting burden for this collection of information is estimated to average 7 minutes per response, including the time for reviewing instructions, searching existing data soures, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, inluding suggestions for reducing this burden, to Department of Agriculture, Clearance Officer, OIRM, Room 404-W, Washington, D.C. 20250; and to the Office of Information and Regulatory Affairs, Office of Management and Budget.

U.S. DEPARTMENT OF AGRICULTURE
FOOD SAFETY AND INSPECTION SERVICE

NONCOMPLIANCE RECORD

TYPE OF NONCOMPLIANCE: ☐ Food Safety ☒ Other Consumer Protecti

1. DATE	2. RECORD NO.	3. ESTABLISHMENT NO.
7/24/2003	12-2003-5313	18229 M / 1

4. TO (*Name and Title*): Nick Simov, President/GM

5. PERSONNEL NOTIFIED:

6. RELEVANT REGULATION(S): 390.30

7. RELEVANT SECTION/PAGE OF ESTABLISHMENT PROCEDURE/PLAN	HACCP	SSOP	OTHER
			(a)(1)(4)

8. ISP CODE: 04C02

9. NONCOMPLIANCE CLASSIFICATION INDICATORS

PLANT PROCESS	A. ☐ SSOP	☐ Monitoring	☐ Corrective Action	☐ Recordkeeping	☐ Implementation
	B. ☐ HACCP	☐ Monitoring	☐ Corrective Action	☐ Recordkeeping	☐ Plant Verification
C.	☒ PRODUCT	☐ Economic	☐ Misbranding	☒ Protocol	
D.	☐ FACILITY	☐ Lighting	☐ Structural	☐ Outside Premises	☐ Product Based
E.	☐ E. COLI	☐ Other			

10. DESCRIPTION OF NONCOMPLIANCE:

At approximately 11:10 a.m. while performing procedure 04c02 I observed the following deficiency.
A hog that had been stunned, shackled and hung was still breathing. I touched the hogs eye and it blinked. this lead me to believe the hog was still conscious. I stopped production and notified [redacted] increased amperage
of stun wand and stunned hog again. I touched eye of hog again
and it did not blink .

11. SIGNATURE OF INSPECTION PROGRAM EMPLOYEE: [redacted]

You are hereby advised of your right to appeal this decision as delineated by 306.5 and/or 381.35 of 9 CFR.

12. PLANT MANAGEMENT RESPONSE *(Immediate actions(s))*:

13. PLANT MANAGEMENT RESPONSE *(further planned actions(s))*:

This document serves as written notification that your failure to comply with regulatory requirement(s) could result in additional regulatory or administrative action.

14. SIGNATURE OF PLANT MANAGEMENT	15. DATE
16. VERIFICATION SIGNATURE OF INSPECTION PROGRAM EMPLOYEE	17. DATE

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U.S. DEPARTMENT OF AGRICULTURE
FOOD SAFETY AND INSPECTION SERVICE

NONCOMPLIANCE RECORD

TYPE OF NONCOMPLIANCE: ☐ Food Safety ☒ Other Consumer Protection

1. DATE	2. RECORD NO.	3. ESTABLISHMENT NO.
07-24-03	14 - 2003	167 M

4. TO (Name and Title): Mr. Jim SowinsKi, Plant Manager

6. PERSONNEL NOTIFIED: [redacted]

6. RELEVANT REGULATION(S): 313.1

7. RELEVANT SECTION/PAGE OF ESTABLISHMENT PROCEDURE/PLAN ➔ | HACCP | SOP | OTHER

8. ISP CODE: 04C02

9. NONCOMPLIANCE CLASSIFICATION INDICATORS

PLANT PROCESS	A. ☐ SSOP	☐ Monitoring	☐ Corrective Action	☐ Recordkeeping	☐ Implementation
	B. ☐ HACCP	☐ Monitoring	☐ Corrective Action	☐ Recordkeeping	☐ Plant Verification
C. ☒ PRODUCT		☐ Economic	☐ Misbranding	☒ Protocol	
D. ☐ FACILITY		☐ Lighting	☐ Structural	☐ Outside Premises	☐ Product Based
E. ☐ E. COLI		☐ Other			

10. DESCRIPTION OF NONCOMPLIA[redacted] Conducted a humane handling verification On July 24, 2003, and observed the following facility deficiencies: 1 broken pipe next to gate #7, broken jagged metal along the pole to gate #11, broken, jagged metal beneath the gate and along 2 pipes on the inside of the gate in pen #12, broken, jagged metal along a horizontal rung and a broken vertical pipe at the rear of pen #13, broken, jagged metal along a pipe inside pen #21, and broken, jagged metal along both sides of the gate that closes off the Stunning area. Animals could become injured.

11. SIG[redacted], DVM

You are h[redacted] and/or 381.35 of 9 CFR.

12. PLANT MANAGEMENT RESPONSE: *(Immediate action(s))*:
All AREAS ABOVE HAD BEEN Repaired To PREVENT INJURY TO THE ANIMALS OLD PIPES WERE Removed AND REPLACED WITH STAINLESS STEEL PIPE TO PREVAT RUST AND FAILING APART. ALSO OTHER AREAS WERE REPAIRED AND Cleaned up.

13. PLANT MANAGEMENT RESPONSE *(Further planned action(s))*:
MONTHLY INSPECTION will TAKE Place in The Barn TO Keep Barn IN GOOD ORDER. ALSO IF ANY Problem IS Discovered By Forman or Employee working in The Barn. PLANT MANAGER AND MAINTENANCE will Be NOTIFIED A.S.A.P. For REPAIR

This document serves as written notification that your failure to comply with regulatory requirement(s) could result in additional regulatory or administrative action.

14. SIGNATURE OF PLANT MANAGEMENT [redacted] | 15. DATE: 8-6-03

16. VERIFICATIC[redacted] | 17. DATE: 8-6-03

FSIS FORM 5400 [redacted]ich may be used — ORIGINAL - Establishment

s.(b)(6)
s.(b)(7)(C)

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U.S. DEPARTMENT OF AGRICULTURE
FOOD SAFETY AND INSPECTION SERVICE

NONCOMPLIANCE RECORD

TYPE OF NONCOMPLIANCE: ☐ Food Safety ☒ Other Consumer Protecti

1. DATE	2. RECORD NO.	3. ESTABLISHMENT NO.
7/15/2003	8-2003-5313	18229 M / 1

4. TO (*Name and Title*)	5. PERSONNEL NOTIFIED
Nick Simov, President/GM	Nick Simov

6. RELEVANT REGULATION(S)
313.1

7. RELEVANT SECTION/PAGE OF ESTABLISHMENT PROCEDURE/PLAN	HACCP	SSOP	OTHER
			sec.(a) (e)

8. ISP CODE 04C02

9. NONCOMPLIANCE CLASSIFICATION INDICATORS

PLANT PROCESS	A. ☐ SSOP	☐ Monitoring	☐ Corrective Action	☐ Recordkeeping	☐ Implementation
	B. ☐ HACCP	☐ Monitoring	☐ Corrective Action	☐ Recordkeeping	☐ Plant Verification
C. ☒ PRODUCT		☐ Economic	☐ Misbranding	☒ Protocol	
D. ☐ FACILITY		☐ Lighting	☐ Structural	☐ Outside Premises	☐ Product Based
E. ☐ E. COLI		☐ Other			

10. DESCRIPTION OF NONCOMPLIANCE:

While performing 04C02Idiscoveredthefollowingdeficiencies.(1)Holding pens did not have ample amount of water for hogs being held. Also to many hogs in each pen to allow hogs to rest. This is a repeat of NR#00016-01.(2)Stainless steal around doorway leading from holding pens to stunning area and lower walls near floor of stunning area have sharp

11. SIGNATURE OF INSPECTION PROGRAM EMPLOYEE

You are hereby advised of your right to appeal this decision as delineated by 306.5 and/or 381.35 of 9 CFR

12. PLANT MANAGEMENT RESPONSE *(Immediate actions(s))*:

13. PLANT MANAGEMENT RESPONSE *(further planned actions(s))*:

This document serves as written notification that your failure to comply with regulatory requirement(s) could result in additional regulatory or administrative action.

14. SIGNATURE OF PLANT MANAGEMENT	15. DATE
16. VERIFICATION SIGNATURE OF INSPECTION PROGRAM EMPLOYEE	17. DATE

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s.(b)(6)
s.(b)(7)(C)

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FOOD SAFETY AND INSPECTION SERVICE

NONCOMPLIANCE RECORD CONTINUATION SHEET

TYPE OF NONCOMPLIANCE
☐ Food Safety ☒ Other Consumer Protection

1. DATE	2. RECORD NO.	3. ESTABLISHMENT NO.
7/15/2003	8-2003-5313	18229 M / 1

4. TO (*Name and Title*)	5. PERSONNEL NOTIFIED
Nick Simov, President/GM	Nick Simov

6. RELEVANT REGULATION(S)
313.1

7. RELEVANT SECTION/PAGE OF ESTABLISHMENT PROCEDURE/PLAN	HACCP	SSOP	OTHER
			sec.(a) (e)

8. ISP CODE	9. NONCOMPLIANCE INDICATOR
04C02	Product Protocol

10. DESCRIPTION OF NONCOMPLIANCE:

and projecting pieces which may cause injury or pain to animals. Repeat of NR#4-2002-2550

11. SIGNATURE OF INSPECTION PROGRAM EMPLOYEE	15. DATE

FSIS FORM 5400-4 (7/98) Replaces FSIS Form 5400-4 (9/97), which may be used until exhausted.(7/98) DISTRIBUTION: Original & 1 copy - Establishment 1 copy - Inspector

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FOOD SAFETY AND INSPECTION SERVICE

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NONCOMPLIANCE RECORD

TYPE OF NONCOMPLIANCE: ☐ Food Safety ☒ Other Consumer Protection

1. DATE	2. RECORD NO.	3. ESTABLISHMENT NO.
7/3/03	79-2003-2602	00244I M / 1

4. TO (*Name and Title*): Darrell Schmidt, Plant Manager

5. PERSONNEL NOTIFIED: [redacted] Hog Buyer

6. RELEVANT REGULATION(S): 9 CFR 313.50(a), 500.2(a)(4), 500.3(b)

7. RELEVANT SECTION/PAGE OF ESTABLISHMENT PROCEDURE/PLAN	HACCP	SSOP	OTHER
			XX

8. ISP CODE: 04C02

9. NONCOMPLIANCE CLASSIFICATION INDICATORS

PLANT PROCESS	A. ☐ SSOP	☐ Monitoring	☐ Corrective Action	☐ Recordkeeping	☐ Implementation	
	B. ☐ HACCP	☐ Monitoring	☐ Corrective Action	☐ Recordkeeping	☐ Plant Verification	
C.	☒ PRODUCT	☐ Economic	☐ Misbranding	☒ Protocol		
D.	☐ FACILITY	☐ Lighting	☐ Structural	☐ Outside Premises	☐ Product Based	
E.	☐ E. COLI	☐ Other				

10. DESCRIPTION OF NONCOMPLIANCE:

At approximately 0740 hours, while performing antemortem inspection in the barn, [redacted] IIC, heard a loud squeal then observed a "subject" hog fall from the bucket of a [redacted] positioned just past the scales, to the cement floor of the main drive alley, a distance of approximately 4-5 vertical feet. The hog stood, walked several feet down the alleyway, then collapsed. [redacted] immediately rejected the bobcat with USDA Retain/Reject tag #B35944565. [redacted] Hog Buyer, was notified of the violation of humane handling requirements. The incident was also witnessed by 2 maintenance and at least 5 barn personnel. Per 9 CFR 500, [redacted] suspended production without providing prior notification until

11. SIGNATURE OF INSPE[redacted] DVM

You are hereby advised of your right to appeal this decision as outlined in [redacted].35 of 9 CFR

12. PLANT MANAGEMENT RESPONSE *(Immediate actions(s))*:

13. PLANT MANAGEMENT RESPONSE *(further planned actions(s))*:

This document serves as written notification that your failure to comply with regulatory requirement(s) could result in additional regulatory or administrative action.

14. SIGNATURE OF PLANT MANAGEMENT	15. DATE
Darrell Schmidt	7-24-03
16. VERIFICATION SIGNATURE OF INSPECTION PROGRAM EMPLOYEE	17. DATE
[redacted]	8/14/03

[redacted]0-4 (9/97), which may be used until [redacted] hausted.(7/98)

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FOOD SAFETY AND INSPECTION SERVICE

NONCOMPLIANCE RECORD CONTINUATION SHEET

TYPE OF NONCOMPLIANCE: ☐ Food Safety ☒ Other Consumer Protection

1. DATE	2. RECORD NO.	3. ESTABLISHMENT NO.
7/3/03	79-2003-2602	00244I M / 1

4. TO (*Name and Title*)	5. PERSONNEL NOTIFIED
Darrell Schmidt, Plant Manager	Hog Buyer

6. RELEVANT REGULATION(S)
9 CFR 313.50(a), 500.2(a)(4), 500.3(b)

7. RELEVANT SECTION/PAGE OF ESTABLISHMENT PROCEDURE/PLAN	HACCP	SSOP	OTHER
			XX

8. ISP CODE	9. NONCOMPLIANCE INDICATOR
04C02	Product Protocol

10. DESCRIPTION OF NONCOMPLIANCE:

provided with immediate and corrective action and further planned preventive action by Superintendent, a period of approximately 15 minutes. was notified verbally and in writing of the failure to comply with humane handling regulatory requirements. Failure to comply with regulatory requirements could result in additional regulatory or administrative action. (65-2003-2889, 06/03/2003)

11. SIGNATURE OF INSPECTION PROGRAM EMPLOYEE	15. DATE

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s.(b)(4)

NONCOMPLIANCE RECORD NUMBER 79-2003-2602

1. **Identify and eliminate the cause of the deviation.**
   The cause of the deviation was investigated immediately after notification of the incident. The cause was due to a team member that tattooed the hog while it was in the bucket of the [redacted] causing the hog to lunge out of the bucket. It was determined during the investigation that the bucket was approximately 3 foot off the ground at the time of the incident.

2. **Establish measures to prevent reoccurrence.**
   The barns manager instructed team members, that hogs will not be tattooed while in the bobcat bucket to prevent reoccurrence

3. **Prevent distribution of product adulterated as a result of the deviation.**
   No product was adulterated as a result of this deviation.

s.(b)(4)
s.(b)(6)
s.(b)(7)(C)

U.S. DEPARTMENT OF AGRICULTURE
FOOD SAFETY AND INSPECTION SERVICE

NONCOMPLIANCE RECORD

TYPE OF NONCOMPLIANCE: ☐ Food Safety ☒ Other Consumer Protection

1. DATE	2. RECORD NO.	3. ESTABLISHMENT NO.
6/30/03	13-2003-1538	20263 M / 1

4. TO (*Name and Title*): Dr. Abdel Nouredin, General Manager

5. PERSONNEL NOTIFIED:

6. RELEVANT REGULATION(S): 313.2

7. RELEVANT SECTION/PAGE OF ESTABLISHMENT PROCEDURE/PLAN	HACCP	SSOP	OTHER
			pg 6-II HACCP

8. ISP CODE: 04C02

9. NONCOMPLIANCE CLASSIFICATION INDICATORS

PLANT PROCESS	A. ☐ SSOP	☐ Monitoring	☐ Corrective Action	☐ Recordkeeping	☐ Implementation	
	B. ☐ HACCP	☐ Monitoring	☐ Corrective Action	☐ Recordkeeping	☐ Plant Verification	
C.	☒ PRODUCT	☐ Economic	☐ Misbranding	☒ Protocol		
D.	☐ FACILITY	☐ Lighting	☐ Structural	☐ Outside Premises	☐ Product Based	
E.	☐ E. COLI	☐ Other				

10. DESCRIPTION OF NONCOMPLIANCE:

Approximately 1000 a goat died in the knocking box dew to handing. I notified and to many animals are in the knocking Box, six animals at a time in the knocking box should prevent further deaths. The company agreed to bring in

11. SIGNATURE OF INSPECTION PROGRAM EMPLOYEE

You are hereby advised of your right to appeal this decision as de

12. PLANT MANAGEMENT RESPONSE (*Immediate actions(s)*):
I stopped what I was doing & verified what happened. I took notice that there were too many animals, so we limited them to in the knocking box.

13. PLANT MANAGEMENT RESPONSE (*further planned actions(s)*):
I Reviewed our haccp & found that a limit needed to be established. So, I went ahead & updated the haccp to ensure that this will not happen again.

This document serves as written notification that your failure to comply with regulatory requirement(s) could result in additional regulatory or administrative action.

14. ~~SIGNATURE OF PLANT MANAGEMENT~~

15. DATE: 7-9-03

16. VERIFICATIO YEE

17. DATE: 7-9-03

FSIS FORM 5400- (9/97), which may be used until exhausted (7/98)

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s.(b)(6)
s.(b)(7)(C)

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U.S. DEPARTMENT OF AGRICULTURE
FOOD SAFETY AND INSPECTION SERVICE

NONCOMPLIANCE RECORD

TYPE OF NONCOMPLIANCE: ☐ Food Safety ☒ Other Consumer Protection

1. DATE	2. RECORD NO.	3. ESTABLISHMENT NO.
6/24/03	3-2003-2597	21188 M / 1

4. TO (*Name and Title*)	5. PERSONNEL NOTIFIED
Eldon Steidinger, President/GM	Eldon Steidinger

6. RELEVANT REGULATION(S)
313 313.30/[illegible]

7. RELEVANT SECTION/PAGE OF ESTABLISHMENT PROCEDURE/PLAN	HACCP	SSOP	OTHER

8. ISP CODE 04C02

9. NONCOMPLIANCE CLASSIFICATION INDICATORS

PLANT PROCESS	A. ☐ SSOP	☐ Monitoring	☐ Corrective Action	☐ Recordkeeping	☐ Implementation
	B. ☐ HACCP	☐ Monitoring	☐ Corrective Action	☐ Recordkeeping	☐ Plant Verification
C.	☒ PRODUCT	☐ Economic	☐ Misbranding	☒ Protocol	
D.	☐ FACILITY	☐ Lighting	☐ Structural	☐ Outside Premises	☐ Product Based
E.	☐ E. COLI	☐ Other			

10. DESCRIPTION OF NONCOMPLIANCE:

[redacted] while performing Humane Slaughter procedure checks at Forrest Meats the following was observed. [redacted]ectrical stunner not properlly stunning animal for 30 seconds, not properly sticking animal to bleed, not placing electrodes on animal head properly to shock animal properly. Harvest scald manager [redacted] was called to show this improper procedure to and he state he was new, he told him and showed him how to do this he was doing ok when [redacted] was there, when [redacted] left [redacted] again started improperly stunning animals. [redacted] was informed of this matter in an exit conference. [redacted] reply is below.

[redacted] [illegible] delineated by 306.5 and/or 381.35 of 9 CFR.

X 12. PLANT MANAGEMENT RESPONSE *(Immediate actions(s))*:
Show employee proper stunning procedure

X 13. PLANT MANAGEMENT RESPONSE *(further planned actions(s))*:

This document serves as written notification that your failure to comply with regulatory requirement(s) could result in additional regulatory or administrative action.

X 14. SIGNATURE OF PLANT MANAGEMENT [signature]

X 15. DATE 6-24-03

16. VERIFIC[redacted]

17. DATE 7/10/2003

[redacted]S FORM [redacted] (9/97), which may be used until exhausted (7/98)

DISTRIBUTION: Original & 1 copy - Establishment
1 copy - Inspector

s.(b)(4)
s.(b)(6)
s.(b)(7)(C)

The request for this information is Voluntary. It is needed to monitor defects found in this inspection system. It is used by FSIS to determine whether establishments are in compliance. 9CFR 301 and 9CFR 381. FORM APPROVED OMB NO. 0583-0089. OMB DISCLOSURE STATEMENT: Public reporting burden for this collection of information is estimated to average 7 minutes per response, including the time for reviewing instructions, searching existing data soures, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, inluding suggestions for reducing this burden, to Department of Agriculture, Clearance Officer, OIRM, Room 404-W, Washington, D.C. 20250; and to the Office of Information and Regulatory Affairs, Office of Management and Budget.

U.S. DEPARTMENT OF AGRICULTURE
FOOD SAFETY AND INSPECTION SERVICE

NONCOMPLIANCE RECORD

TYPE OF NONCOMPLIANCE: ☐ Food Safety ☒ Other Consumer Protection

1. DATE	2. RECORD NO.	3. ESTABLISHMENT NO.
6/4/03	26-2003-4036	00085B M / 1

4. TO (*Name and Title*): Larry Corbin, Regulatory Superintendent

5. PERSONNEL NOTIFIED:

6. RELEVANT REGULATION(S): 313.30

7. RELEVANT SECTION/PAGE OF ESTABLISHMENT PROCEDURE/PLAN	HACCP	SSOP	OTHER
			a(3) b(3) pgs. 64d,e

8. ISP CODE: 04C02

9. NONCOMPLIANCE CLASSIFICATION INDICATORS

PLANT PROCESS	A. ☐ SSOP	☐ Monitoring	☐ Corrective Action	☐ Recordkeeping	☐ Implementation	
	B. ☐ HACCP	☐ Monitoring	☐ Corrective Action	☐ Recordkeeping	☐ Plant Verification	
C.	☒ PRODUCT	☐ Economic	☐ Misbranding	☒ Protocol		
D.	☐ FACILITY	☐ Lighting	☐ Structural	☐ Outside Premises	☐ Product Based	
E.	☐ E. COLI	☐ Other				

10. DESCRIPTION OF NONCOMPLIANCE:

At approximately 1005 while performing inspection procedure 04CO2 in the suspect or FS-3 conditions pen I observed a plant employee applying an electrical stunning device to 2 hogs. The employee applied the device in such a manner that the quality and location of the electrical shock did not produce immediate insensibility to pain. The employee applied the device incorrectly several times to the 2 hogs. The 2 hogs jumped and squealed upon each incorrect application of the electrical shock. I stopped the employee's actions.I walked to the and instructed the plant employees to stop any additional hogs from entering the .I asked the employee to contact a supervisor . I

11. SIGNATURE OF INSPECTION PROGRAM E [redacted] 6/4/03

[redacted] of your right to appeal this d [redacted]

12. PLANT MANAGEMENT RESPONSE *(Immed*

13. PLANT MANAGEMENT RESPONSE *(further planned actions(s))*:

This document serves as written notification that your failure to comply with regulatory requirement(s) could result in additional regulatory or administrative action.

14. SIGNATURE OF PLANT MANAGEMENT	15. DATE
16. VERIFICATION SIGNATURE OF INSPECTION PROGRAM EMPLOYEE	17. DATE

FSIS FORM 5400-4 (7/95) Replaces FSIS Form 5400-4 (9/97), which may be used until exhausted.(7/98) DISTRIBUTION: Original & 1 copy - Establishmen 1 copy - Inspector

U.S. DEPARTMENT OF AGRICULTURE
FOOD SAFETY AND INSPECTION SERVICE

NONCOMPLIANCE RECORD CONTINUATION SHEET

TYPE OF NONCOMPLIANCE: ☐ Food Safety ☒ Other Consumer Protection

1. DATE	2. RECORD NO.	3. ESTABLISHMENT NO.
6/4/03	26-2003-4036	00085B M / 1

4. TO (*Name and Title*): Larry Corbin, Regulatory Superintendent

5. PERSONNEL NOTIFIED:

6. RELEVANT REGULATION(S): 313.30

7. RELEVANT SECTION/PAGE OF ESTABLISHMENT PROCEDURE/PLAN	HACCP	SSOP	OTHER
			a(3) b(3) pgs. 64d,è

8. ISP CODE	9. NONCOMPLIANCE INDICATOR
04C02	Product Protocol

10. DESCRIPTION OF NONCOMPLIANCE:

notified of the deficiency. I asked for a corrective action The corrective action was to re-train the employee,and provide another employee to stun who was properly trained in hand stunning. I allowed the plant to resume stunning.

11. SIGNATURE OF INSPECTION PR

15. DATE 6/4/03

FSIS FORM 5400-4 (7/98) may be used until exhausted. (7/98) DISTRIBUTION: Original & 1 copy - Establishmen 1 copy - Inspector

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s.(b)(7)(C)

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U.S. DEPARTMENT OF AGRICULTURE
FOOD SAFETY AND INSPECTION SERVICE

NONCOMPLIANCE RECORD

TYPE OF NONCOMPLIANCE: ☐ Food Safety ☒ Other Consumer Protection

1. DATE	2. RECORD NO.	3. ESTABLISHMENT NO.
3/26/03	8-2003-2482	17496 M / 1

4. TO (*Name and Title*)	5. PERSONNEL NOTIFIED
Ronald Buncich, President/GM	Ronald Buncich

6. RELEVANT REGULATION(S)
313.30 (a)(4)

7. RELEVANT SECTION/PAGE OF ESTABLISHMENT PROCEDURE/PLAN	HACCP	SSOP	OTHER

8. ISP CODE 04C02

9. NONCOMPLIANCE CLASSIFICATION INDICATORS

PLANT PROCESS	A. ☐ SSOP	☐ Monitoring	☐ Corrective Action	☐ Recordkeeping	☐ Implementation
	B. ☐ HACCP	☐ Monitoring	☐ Corrective Action	☐ Recordkeeping	☐ Plant Verification
C.	☒ PRODUCT	☐ Economic	☐ Misbranding	☒ Protocol	
D.	☐ FACILITY	☐ Lighting	☐ Structural	☐ Outside Premises	☐ Product Based
E.	☐ E. COLI	☐ Other			

10. DESCRIPTION OF NONCOMPLIANCE:

At 0859 hours I went to observe the human slaughter procedure. I observed the plant employee stun one hog while another hog had already been stunned and was laying on the floor. The employee then hoisted the second stunned hog to the rail for sticking while the first stunned hog was still laying on the floor. The first stunned hog was then hoisted to the rail for sticking. The correct procedure for stunning is to stun one hog only, shackle and lift it, to send it to the bleeding area and then to proceed with stunning the next hog. As I was watching the stunning procedure Ron Buncich walked up. I relayed to him what I had observed. He notified [redacted] to talk to the employee to find out why

11. SIGNATURE OF INS[redacted]

You are hereby advised of your right to appeal this decision as delineated by 500.7 and/or 381.35 of 9 CFR.

12. PLANT MANAGEMENT RESPONSE *(Immediate action(s))*:
mangmt stopped stunning and Employee was taken out Pen and talked to, that one only one Hog will be hoisted at time Pen is being cleaned

13. PLANT MANAGEMENT RESPONSE *(further planned action(s))*:
Employee in stunning Pen have been told that will not stun only one Pig at time

This document serves as written notification that your failure to comply with regulatory requirement(s) could result in additional regulatory or administrative action.

14. SIGNATURE OF PLANT MANAGEMENT	15. DATE
[signature]	3-26-03
16. VERIFICATION SIGNATURE OF INSPECTION PROGRAM EMPLOYEE	17. DATE

FSIS FORM 5400-4 (7/98) Replaces FSIS Form 5400-4 (9/97), which may be used until exhausted (7/98) DISTRIBUTION: Original & 1 copy - Establishment 1 copy - Inspector

s.(b)(6)
s.(b)(7)(C)

U.S. DEPARTMENT OF AGRICULTURE
FOOD SAFETY AND INSPECTION SERVICE

NONCOMPLIANCE RECORD CONTINUATION SHEET

TYPE OF NONCOMPLIANCE
[ ] Food Safety [X] Other Consumer Protection

1. DATE	2. RECORD NO.	3. ESTABLISHMENT NO.
3/26/03	6-2003-2482	17496 M / 1

4. TO (*Name and Title*)	5. PERSONNEL NOTIFIED
Ronald Buncich, President/GM	Ronald Buncich

6. RELEVANT REGULATION(S)
313.30 (a)(4)

7. RELEVANT SECTION/PAGE OF ESTABLISHMENT PROCEDURE/PLAN	HACCP	SSOP	OTHER

8. ISP CODE	9. NONCOMPLIANCE INDICATOR
04C02	Product Protocol

10. DESCRIPTION OF NONCOMPLIANCE:

he had stunned 2 hogs before hoisting them to the rail for sticking.
I do not know what the employee told

11. SIGNATURE OF INSPECTION PROGRAM EMPLOYEE	15. DATE

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s.(b)(7)(C)

U.S. DEPARTMENT OF AGRICULTURE
FOOD SAFETY AND INSPECTION SERVICE

NONCOMPLIANCE RECORD

TYPE OF NONCOMPLIANCE: ☐ Food Safety ☒ Other Consumer Protection

1. DATE	2. RECORD NO.	3. ESTABLISHMENT NO.
3/24/03	13-2003-2507	02594 M / 1

4. TO (*Name and Title*): Martin Ward, President/GM

5. PERSONNEL NOTIFIED: [redacted]

6. RELEVANT REGULATION(S): 313.2 (e)

7. RELEVANT SECTION/PAGE OF ESTABLISHMENT PROCEDURE/PLAN	HACCP	SSOP	OTHER

8. ISP CODE: 04C02

9. NONCOMPLIANCE CLASSIFICATION INDICATORS

PLANT PROCESS	A. ☐ SSOP	☐ Monitoring	☐ Corrective Action	☐ Recordkeeping	☐ Implementation
	B. ☐ HACCP	☐ Monitoring	☐ Corrective Action	☐ Recordkeeping	☐ Plant Verification
C.	☒ PRODUCT	☐ Economic	☐ Misbranding	☒ Protocol	
D.	☐ FACILITY	☐ Lighting	☐ Structural	☐ Outside Premises	☐ Product Based
E.	☐ E. COLI	☐ Other			

10. DESCRIPTION OF NONCOMPLIANCE:

While Performing 04C02 I noted the following: The hogs in pen #3 have no access to water. Regulations 313.2 (e) States the following: Animals shall have access to water in all holding pens.

11. SIGNATURE OF INSPECTION PROGRAM EMPLOYEE: [redacted]

You are hereby advised of your right to appeal this decision as delineated by 306.5 and/or 381.35 of 9 CFR.

12. PLANT MANAGEMENT RESPONSE *(Immediate actions(s))*:

Watering Stopped
Pen by Removed Hogs from pen to Pen W/ Water access until Nipple Replaced

13. PLANT MANAGEMENT RESPONSE *(further planned actions(s))*:

Water Lines flushed of mast

Water to be repaired

This document serves as written notification that your failure to comply with regulatory requirement(s) could result in additional regulatory or administrative action.

14. SIGNATURE OF PLANT MANAGEMENT	15. DATE
[redacted]	3-24-03
16. VE[redacted]OGRAM EMPLOYEE	17. DATE 4-3-03

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compliance. 9CFR 301 and 9CFR 381. FORM APPROVED OMB NO. 0583-0089. OMB DISCLOSURE STATEMENT: Public reporting burden for this collection of information is estimated to average 7 minutes per response, including the time for reviewing instructions, searching existing data soures, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, inluding suggestions for reducing this burden, to Department of Agriculture, Clearance Officer, OIRM, Room 404-W, Washington, D.C. 20250; and to the Office of Information and Regulatory Affairs, Office of Management and Budget.

U.S. DEPARTMENT OF AGRICULTURE
FOOD SAFETY AND INSPECTION SERVICE

NONCOMPLIANCE RECORD

TYPE OF NONCOMPLIANCE: ☐ Food Safety ☒ Other Consumer Protection

1. DATE	2. RECORD NO.	3. ESTABLISHMENT NO.
3/21/03	10-2003-2507	02594 M / 1

4. TO (*Name and Title*)	5. PERSONNEL NOTIFIED
Martin Ward, President/GM	Martin Ward

6. RELEVANT REGULATION(S)
313.1 (a)

7. RELEVANT SECTION/PAGE OF ESTABLISHMENT PROCEDURE/PLAN	HACCP	SSOP	OTHER
			NA

8. ISP CODE 04C02

9. NONCOMPLIANCE CLASSIFICATION INDICATORS

PLANT PROCESS	A. ☐ SSOP	☐ Monitoring	☐ Corrective Action	☐ Recordkeeping	☐ Implementation
	B. ☐ HACCP	☐ Monitoring	☐ Corrective Action	☐ Recordkeeping	☐ Plant Verification
C.	☒ PRODUCT	☐ Economic	☐ Misbranding	☒ Protocol	
D.	☐ FACILITY	☐ Lighting	☐ Structural	☐ Outside Premises	☐ Product Based
E.	☐ E. COLI	☐ Other			

10. DESCRIPTION OF NONCOMPLIANCE:

While doing Antemortem Procedures, I observed 1 hog with a badly slashed leg due to being cut by loose metal floor lates on the scale used for weighing lots of hogs.

Scale Rejected. Reject Tag Numbers: B 29 940727 and B 34 088962.

11. SIGNATURE OF INSPECTION PROGRAM EMPLOYEE

You are hereby advised of your right to appeal this decision as delineated by 306.5 and/or 381.35 of 9 CFR.

12. PLANT MANAGEMENT RESPONSE *(Immediate actions(s))*:
Floor to be repaired of metal standing up
Area tagged and ☒ Use of Scale Supended

13. PLANT MANAGEMENT RESPONSE *(further planned actions(s))*:
All loose metal standing up fasten to floor

This document serves as written notification that your failure to comply with regulatory requirement(s) could result in additional regulatory or administrative action.

14. SIGNATURE OF PLANT MANAGEMENT	15. DATE
Ray Kleinert	3-21-03
16. VERIFICATION SIGNATURE OF INSPECTION PROGRAM EMPLOYEE	17. DATE
	4-3-03

FSIS FORM 5400-4 (7/98) Replaces FSIS Form 5400-4 (9/97), which may be used until exhausted.(7/98) DISTRIBUTION: Original & 1 copy - Establishment 1 copy - Inspector

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U.S. DEPARTMENT OF AGRICULTURE
FOOD SAFETY AND INSPECTION SERVICE

NONCOMPLIANCE RECORD

TYPE OF NONCOMPLIANCE: ☐ Food Safety ☒ Other Consumer Protection

1. DATE	2. RECORD NO.	3. ESTABLISHMENT NO.
3/17/03	9-2003-2507	02594 M / 1

4. TO (*Name and Title*): Martin Ward, President/GM

5. PERSONNEL NOTIFIED: Martin Ward

6. RELEVANT REGULATION(S): Reg. 313.1 (a)

7. RELEVANT SECTION/PAGE OF ESTABLISHMENT PROCEDURE/PLAN	HACCP	SSOP	OTHER
			NA

8. ISP CODE: 04C02

9. NONCOMPLIANCE CLASSIFICATION INDICATORS

PLANT PROCESS	A. ☐ SSOP	☐ Monitoring	☐ Corrective Action	☐ Recordkeeping	☐ Implementation	
	B. ☐ HACCP	☐ Monitoring	☐ Corrective Action	☐ Recordkeeping	☐ Plant Verification	
C.	☒ PRODUCT	☐ Economic	☐ Misbranding	☒ Protocol		
D.	☐ FACILITY	☐ Lighting	☐ Structural	☐ Outside Premises	☐ Product Based	
E.	☐ E. COLI	☐ Other				

10. DESCRIPTION OF NONCOMPLIANCE:

While doing Antemortem Procedures, I observed a hog that broke its leg because of a hole in the floor of the scale used to weigh lots of hogs. The scale was rejected - Reject Tag B 29 940718.

Reg. 313.1 (a) states:
"Sec. 313.1 Livestock pens, driveways and ramps.
(a) Livestock pens, driveways and ramps shall be maintained in good repair. They shall be free from sharp or

11. SIGNATURE OF INSPECTION PROGRAM EMPLOYEE

You are hereby advised of your right to appeal this decision as delineated by 306.5 and/or 381.35 of 9 CFR.

12. PLANT MANAGEMENT RESPONSE (*Immediate actions(s)*):
Scale to be repaired
Area tagged and Scale By Passed until Repairs Complet

13. PLANT MANAGEMENT RESPONSE (*further planned actions(s)*):
Scale repaired holes in floor

This document serves as written notification that your failure to comply with regulatory requirement(s) could result in additional regulatory or administrative action.

14. SIGNATURE OF PLANT MANAGEMENT	15. DATE
Ray Dummert	3-17-03
16. VERIFIC[redacted]PLOYEE	17. DATE 3-17-03

FSIS FORM 5400-4 (7/98) Replaces FSIS Form 5400-4 (9/97), which may be used until exhausted.(7/98)

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s.(b)(7)(C)

U.S. DEPARTMENT OF AGRICULTURE
FOOD SAFETY AND INSPECTION SERVICE

NONCOMPLIANCE RECORD CONTINUATION SHEET

TYPE OF NONCOMPLIANCE
☐ Food Safety ☒ Other Consumer Protection

1. DATE	2. RECORD NO.	3. ESTABLISHMENT NO.
3/17/2003	9-2003-2507	02594 M / 1

4. TO (*Name and Title*)	5. PERSONNEL NOTIFIED
Martin Ward, President/GM	Martin Ward,

6. RELEVANT REGULATION(S)
Reg. 313.1 (a)

7. RELEVANT SECTION/PAGE OF ESTABLISHMENT PROCEDURE/PLAN	HACCP	SSOP	OTHER
			NA

8. ISP CODE	9. NONCOMPLIANCE INDICATOR
04C02	Product Protocol

10. DESCRIPTION OF NONCOMPLIANCE:

protruding objects which may, in the opinion of the inspector, cause injury or pain to the animals. Loose boards, splintered or broken planking, and unnecessary openings where the head, feet, or legs of an animal may be injured shall be repaired."

11. SIGNATURE OF INSPECTION PROGRAM EMPLOYEE	15. DATE
	3-17-03

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U.S. DEPARTMENT OF AGRICULTURE
FOOD SAFETY AND INSPECTION SERVICE

NONCOMPLIANCE RECORD

TYPE OF NONCOMPLIANCE: ☐ Food Safety ☒ Other Consumer Protection

1. DATE	2. RECORD NO.	3. ESTABLISHMENT NO.
3/12/03	6-2003-3896	17496 M / 1

4. TO (*Name and Title*): Ronald Buncich, President/GM

5. PERSONNEL NOTIFIED:

6. RELEVANT REGULATION(S): 313.2, 313.30

7. RELEVANT SECTION/PAGE OF ESTABLISHMENT PROCEDURE/PLAN	HACCP	SSOP	OTHER
			X

8. ISP CODE: 04C02

9. NONCOMPLIANCE CLASSIFICATION INDICATORS

PLANT PROCESS	A. ☐ SSOP	☐ Monitoring	☐ Corrective Action	☐ Recordkeeping	☐ Implementation
	B. ☐ HACCP	☐ Monitoring	☐ Corrective Action	☐ Recordkeeping	☐ Plant Verification
C.	☒ PRODUCT	☐ Economic	☐ Misbranding	☒ Protocol	
D.	☐ FACILITY	☐ Lighting	☐ Structural	☐ Outside Premises	☐ Product Based
E.	☐ E. COLI	☐ Other			

10. DESCRIPTION OF NONCOMPLIANCE:

At 0900 hours I went to observe the stunning/bleeding procedure. As I looked into the stunning area I observed an employee standing, with both feet, on a downed stunned hog. The employees then shackled & hoisted it over to the sticking area. I then observed a live conscious hog laying under the scald tank in the bleeding area. Upon seeing me, the sticker then asked the stunning crew for the hoist chain. proceeded to shackle the awake hog by the front leg & directed the stunning crew on dragging the hog out from under the scald tank and took several attempts in hoisting this awake hog over the gate back to the stunning area as the chain got caught in the gate & sterilizer. The hog was

11. SIGNATURE OF INSPECT: S VMD

You are hereby advised of your right to appeal this decision as delineated by 306.5 and/or 381.35 of 9 CFR.

12. PLANT MANAGEMENT RESPONSE *(Immediate actions(s))*:
Employee was told By management what is not to be done. management told to shackl Pen Employee is on the way ~~will be~~ shackled Pen will done.

13. PLANT MANAGEMENT RESPONSE *(further planned actions(s))*:
all shackle Pen stick Pen Employee are going to be retrain, on the PSP and don't shackle and sticking

This document serves as written notification that your failure to comply with regulatory requirement(s) could result in additional regulatory or administrative action.

12:05 PM

14. SIGNATURE OF PLANT MANAGEMENT:

15. DATE: 3-12-03

16. VERIFICATION S AM EMPLOYEE: SVMD

17. DATE: 3/12/03

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U.S. DEPARTMENT OF AGRICULTURE
FOOD SAFETY AND INSPECTION SERVICE

NONCOMPLIANCE RECORD CONTINUATION SHEET

TYPE OF NONCOMPLIANCE: [ ] Food Safety [X] Other Consumer Protection

1. DATE	2. RECORD NO.	3. ESTABLISHMENT NO.
3/12/03	6-2003-3896	17496 M / 1

4. TO (*Name and Title*): Ronald Buncich, President/GM

5. PERSONNEL NOTIFIED:

6. RELEVANT REGULATION(S): 313.2, 313.30

7. RELEVANT SECTION/PAGE OF ESTABLISHMENT PROCEDURE/PLAN	HACCP	SSOP	OTHER
			x

8. ISP CODE	9. NONCOMPLIANCE INDICATOR
04C02	Product Protocol

10. DESCRIPTION OF NONCOMPLIANCE:

restunned, hoisted & stuck. At this time [redacted] came over to the area & I explained what I observed. [redacted] said the hog had kicked itself off the shackle the 1st time.
These are both inhumane actions in the stunning/bleeding procedure. The conscious hog should have been stunned prior to trying to drag it out from under the scald tank.
This is a repeat deficiency. See NR 7-2002 dated 10/29/02.

Employee's were told By management what is not to be done. management talk to stuck Pen Employee's on the way ~~will be~~ shackel Pen will done.

all shackle Pen an stick Pen Employee's are going to be rehired, on the P/r and don't do shackely and sticking

12:05 PM

14. SIGNATURE OF INSPECTION PERSONNEL: [redacted] SVMO — 15. DATE: 3-12-03 / 3/12/03

FSIS FORM 5400-4 (7/98) — Replaces FSIS Form 5400-4 (9/97), which may be used until exhausted (7/98) — DISTRIBUTION: Original & 1 copy - Establishm 1 copy - Inspector

s.(b)(6)
s.(b)(7)(C)

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U.S. DEPARTMENT OF AGRICULTURE
FOOD SAFETY AND INSPECTION SERVICE

NONCOMPLIANCE RECORD

TYPE OF NONCOMPLIANCE: [ ] Food Safety [X] Other Consumer Protection

1. DATE	2. RECORD NO.	3. ESTABLISHMENT NO.
3/4/03	3-2003-2382	01737 M / 1

4. TO (*Name and Title*): Tom Sullivan, President/GM

5. PERSONNEL NOTIFIED:

6. RELEVANT REGULATION(S): 313.1 (E)

7. RELEVANT SECTION/PAGE OF ESTABLISHMENT PROCEDURE/PLAN	HACCP	SSOP	OTHER

8. ISP CODE: 04C02

9. NONCOMPLIANCE CLASSIFICATION INDICATORS

PLANT PROCESS A. [ ] SSOP	[ ] Monitoring	[ ] Corrective Action	[ ] Recordkeeping	[ ] Implementation
PLANT PROCESS B. [ ] HACCP	[ ] Monitoring	[ ] Corrective Action	[ ] Recordkeeping	[ ] Plant Verification
C. [X] PRODUCT	[ ] Economic	[ ] Misbranding	[X] Protocol	
D. [ ] FACILITY	[ ] Lighting	[ ] Structural	[ ] Outside Premises	[ ] Product Based
E. [ ] E. COLI	[ ] Other			

10. DESCRIPTION OF NONCOMPLIANCE:

At approximately 06:50 while performing PBIS task 04C02 humane handling livestock. I observed two holding pens containing fifty-eight head of livestock with no access to water because the water was frozen. I then asked program employee to get supervisor to observe this non compliance.

11. SIGNATURE OF INSPECTION

You are hereby advised of your right to appeal this decision as described in Subpart [illegible] 9 CFR.

12. PLANT MANAGEMENT RESPONSE *(Immediate actions(s))*:

Water tanks were inspected and the float values were found to be frozen. The values were thawed immediately restoring water to the pens.

13. PLANT MANAGEMENT RESPONSE *(further planned actions(s))*:

Water tanks and float values will be continuously monitored ~~each~~ throughout each day to ensure compliance with relevent regulations.

This document serves as written notification that your failure to comply with regulatory requirement(s) could result in additional regulatory or administrative action.

14. SIGNATURE OF PLANT MANAGEMENT: George Sullivan — 15. DATE: 3/5/03

SIGNATURE OF INSPECTION PROGRAM EMPLOYEE — 17. DATE: 03-07-03

FSIS 5000-3 (7/98) may be used until exhausted.

DISTRIBUTION: Original & 1 copy - Establishment, 1 copy - Inspector

The request for this information is Voluntary. It is needed to monitor defects found in this inspection system. It is used by FSIS to determine whether establishments are in compliance. 9CFR 301 and 9CFR 381. FORM APPROVED OMB NO. 0583-0089. OMB DISCLOSURE STATEMENT: Public reporting burden for this collection of information is estimated to average 7 minutes per response, including the time for reviewing instructions, searching existing data soures, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, inluding suggestions for reducing this burden, to Department of Agriculture, Clearance Officer, OIRM, Room 404-W, Washington, D.C. 20250; and to the Office of Information and Regulatory Affairs, Office of Management and Budget.

U.S. DEPARTMENT OF AGRICULTURE
FOOD SAFETY AND INSPECTION SERVICE

NONCOMPLIANCE RECORD

TYPE OF NONCOMPLIANCE

☐ Food Safety ☒ Other Consumer Protection

1. DATE	2. RECORD NO.	3. ESTABLISHMENT NO.
02/20/2003	2-2003-2423	06775 M / 1

4. TO (*Name and Title*)	5. PERSONNEL NOTIFIED
Jim Forbes, President/GM	Jim Forbes

6. RELEVANT REGULATION(S)

Part 313, Directive 6900.1

7. RELEVANT SECTION/PAGE OF ESTABLISHMENT PROCEDURE/PLAN	HACCP	SSOP	OTHER

8. ISP CODE 04C02

9. NONCOMPLIANCE CLASSIFICATION INDICATORS

PLANT PROCESS	A. ☐ SSOP	☐ Monitoring	☐ Corrective Action	☐ Recordkeeping	☐ Implementation
	B. ☐ HACCP	☐ Monitoring	☐ Corrective Action	☐ Recordkeeping	☐ Plant Verification
C.	☒ PRODUCT	☐ Economic	☐ Misbranding	☒ Protocol	
D.	☐ FACILITY	☐ Lighting	☐ Structural	☐ Outside Premises	☐ Product Based
E.	☐ E. COLI	☐ Other			

Best Copy Available

s.(b)(4)
s.(b)(6)
s.(b)(7)(C)

On February 20,2003 at 10:35am Circuit Supervisor, [redacted] observed a load of swine (boars and sows) being unloaded at Calihan Pork Processors. He observed several disabled animals being pulled from the truck. Operations were immediately stopped and Mr. Jim Forbes, General Manager was notified. At this time a meeting was held with [redacted] Circuit Supervisor-USDA; [redacted] ,IIC-Est.06775M-USDA; Jim Forbes,General Manager-Calihan Pork Processor and [redacted] and agreement was met. A letter was issued to the USDA and operations resumed. There was downtime of 20 minutes.

11. SIGNATURE OF INSPECT [redacted] DVM

You are hereby advised of your right to appeal this decision as delineated by 306.5 and/or 381.35 of 9 CFR.

12. PLANT MANAGEMENT RESPONSE *(Immediate actions(s))*:

See letter attached

13. PLANT MANAGEMENT RESPONSE *(further planned actions(s))*:

See letter and fax attached

This document serves as written notification that your failure to comply with regulatory requirement(s) could result in additional regulatory or administrative action.

14. SIGNATURE OF PLANT MANAGEMENT	15. DATE
Jim Forbes	2-21-03
16. VERIFICATION SIGNATURE OF INSPECTION PROGRAM EMPLOYEE	17. DATE

FSIS FORM 5400-4 (7/98) Replaces FSIS Form 5400-4 (9/97), which may be used until exhausted.(7/98) DISTRIBUTION: Original & 1 copy - Establishment, 1 copy - Inspector

Best Copy Available

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000172

s.(b)(4)
s.(b)(6)
s.(b)(7)(C)

CALIHAN
(309) 674-9175
Peoria, IL
PORK PROCESSORS

February 20, 2003

[redacted]
IIC Est. 6775
One South St.
Peoria, IL 61602

Re. Human handling of downers on trucks

Effective immediately [redacted] has been instructed that any downer hogs on a truck on Calihan Pork Processors premises have to be pre mortem inspected by the IIC. After this inspection they are to be rendered unconscious, dragged from the truck, and transported to our cripple chute and the slaughter process completed.

Thank you,

Jim Forbes

Jim Forbes
Vice President & General Manager

Cc. [redacted]

JIM FORBES, GENERAL MANAGER
FAX: (309)674-3003

P.O. BOX 1155, PEORIA, IL 61653
ONE SOUTH ST., PEORIA, IL 61602

s.(b)(4)
s.(b)(6)
s.(b)(7)(C)

CALIHAN PORK PROCESSORS
(309) 674-9175
Peoria, IL

February 20, 2003

Re: Human Handling of Downers on Truck

Reiterating our conversation today with and on unloading downer hogs on our premises. The following procedures must be met.

1. If a hog cannot move off the truck by itself during operating hours the IIC (vet) must look at the hog alive. They will determine if it is suitable for slaughter. During non business hours cripples on the truck to be shot and received as dead.
2. If the disposition is favorable for slaughter the hog can be knocked (shot), dragged off truck to the bobcat, transported to the cripple chute and slaughter process completed.

Thank you,

Jim Forbes

Jim Forbes
Vice President & General Manager
Calihan Pork Processors, Inc.

Cc.
Cc. I Code of Federal Regulations, Title 9, Part 313 and copy of letter to on Human Handling dated Feb. 20, 2003

JIM FORBES, GENERAL MANAGER
FAX: (309)674-3003

P.O. BOX 1155, PEORIA, IL 61653
ONE SOUTH ST., PEORIA, IL 61602

s.(b)(4)
s.(b)(6)
s.(b)(7)(C)

CALIHAN

TO Fax

Calihan Pork Proc
1 South Street
Peoria, IL 61602
Ph.: (309)674-9175
Fax: (309)674-3003

(Des moines) (Fremont) (
Pittsfield
(Charleston) (Iowa) (
(mail)

Fax

To: **Pages:** (including cover) 2

Fax: **Date:** 2-20-03

Re: Humane handling of livestock

☒ **Urgent** ☐ **For Review** ☐ **Please Comment** **Please Reply** ☐ **Please Recycle**

• **Comments:**

Please read and comply with copy of attached letter to is considered an employee of Calihan when your trucks back up to the chutes. They and your drivers (Also considered our employee) MUST comply with all regulations of Humane handling of livestock issued by the USDA.

This letter to is covering only unloading of cripples. If you need a copy of The code of Federal Regulations covering all asperts of Humane Slaughter of livestock please let me know. failure to comply with this unloading procedure will result in our facility being shut down.

Jim Forbes

s.(b)(6)
s.(b)(7)(C)

U.S. DEPARTMENT OF AGRICULTURE
FOOD SAFETY AND INSPECTION SERVICE

NONCOMPLIANCE RECORD

TYPE OF NONCOMPLIANCE: ☐ Food Safety ☒ Other Consumer Protection

1. DATE	2. RECORD NO.	3. ESTABLISHMENT NO.
2/19/03	5-2003-2775	01851 M / 1

4. TO (Name and Title)	5. PERSONNEL NOTIFIED
David Follenweider, V.P.	David Follenweider

6. RELEVANT REGULATION(S): 313.2(e)

7. RELEVANT SECTION/PAGE OF ESTABLISHMENT PROCEDURE/PLAN	HACCP	SSOP	OTHER
			kill op

8. ISP CODE: 04C02

9. NONCOMPLIANCE CLASSIFICATION INDICATORS

PLANT PROCESS	A. ☐ SSOP	☐ Monitoring	☐ Corrective Action	☐ Recordkeeping	☐ Implementation
	B. ☐ HACCP	☐ Monitoring	☐ Corrective Action	☐ Recordkeeping	☐ Plant Verification
C.	☒ PRODUCT	☐ Economic	☐ Misbranding	☒ Protocol	
D.	☐ FACILITY	☐ Lighting	☐ Structural	☐ Outside Premises	☐ Product Based
E.	☐ E. COLI	☐ Other			

10. DESCRIPTION OF NONCOMPLIANCE:

At approx. 1050hrs observed approx. 10 calves in the outdoor holding pen. These calves did not have access to water as is required be above cited regulation.

11. SIGNATURE OF INSPECTION PROGRAM EMPLOYEE

s delineated by 306.5 and/or 381.35 of 9 CFR.

12. PLANT MANAGEMENT RESPONSE (Immediate actions(s)):

WATER WAS given TO CALVES.

13. PLANT MANAGEMENT RESPONSE (further planned actions(s)):

CALVES PEN - AREA PUT ON OUTSIDE WILL HAVE FOUNTAIN OF CONTINUOUS OF WATER. SUPERVISOR DR WILL MAKE SURE THIS IS DONE

This document serves as written notification that your failure to comply with regulatory requirement(s) could result in additional regulatory or administrative action.

14. SIGNATURE OF PLANT MANAGEMENT

15. DATE

16. VER LOYEE

17. DATE

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n 5400-4 (9/97), which may be used until DISTRIBUT

1 copy - Inspector

s.(b)(6)
s.(b)(7)(C)

The request for this information is Voluntary. It is needed to monitor defects found in this inspection system. It is used by FSIS to determine whether establishments are in compliance. 9CFR 301 and 9CFR 381. FORM APPROVED OMB NO. 0583-0089. OMB DISCLOSURE STATEMENT: Public reporting burden for this collection of information is estimated to average 7 minutes per response, including the time for reviewing instructions, searching existing data soures, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, inluding suggestions for reducing this burden, to Department of Agriculture, Clearance Officer, OIRM, Room 404-W, Washington, D.C. 20250; and to the Office of Information and Regulatory Affairs, Office of Management and Budget.

U.S. DEPARTMENT OF AGRICULTURE
FOOD SAFETY AND INSPECTION SERVICE

NONCOMPLIANCE RECORD

TYPE OF NONCOMPLIANCE: ☐ Food Safety ☒ Other Consumer Protecti

1. DATE	2. RECORD NO.	3. ESTABLISHMENT NO.
2/12/2003	1-2003-2508	05502 M / 1

4. TO (*Name and Title*)	5. PERSONNEL NOTIFIED
Ed Oedzes, President/GM	Ed Oedzes

6. RELEVANT REGULATION(S)
313.1{b.}

7. RELEVANT SECTION/PAGE OF ESTABLISHMENT PROCEDURE/PLAN	HACCP	SSOP	OTHER

8. ISP CODE 04C02

9. NONCOMPLIANCE CLASSIFICATION INDICATORS

PLANT PROCESS	A. ☐ SSOP	☐ Monitoring	☐ Corrective Action	☐ Recordkeeping	☐ Implementation
	B. ☐ HACCP	☐ Monitoring	☐ Corrective Action	☐ Recordkeeping	☐ Plant Verification
C.	☒ PRODUCT	☐ Economic	☐ Misbranding	☒ Protocol	
D.	☐ FACILITY	☐ Lighting	☐ Structural	☐ Outside Premises	☐ Product Based
E.	☐ E. COLI	☐ Other			

10. DESCRIPTION OF NONCOMPLIANCE:

At approximately 1100, 2-6-03, during a review by [redacted] Circuit 5013 Supervisor, observation was made of several small calves slipping on the unloading ramp. [redacted] was informed of failure to meet the requirements of 9CFR 313.1{b} of the Federal Meat Regulations

11. SIGNATURE OF INSPECTION PROGRAM EMPLOYEE [redacted]

You are hereby advised of your right to appeal this decision as delineated by 306.5 and/or 381.35 of 9 CFR.

12. PLANT MANAGEMENT RESPONSE *(Immediate actions(s))*:

13. PLANT MANAGEMENT RESPONSE *(further planned actions(s))*:

This document serves as written notification that your failure to comply with regulatory requirement(s) could result in additional regulatory or administrative action.

14. SIGNATURE OF PLANT MANAGEMENT	15. DATE
16. VERIFICATION SIGNATURE OF INSPECTION PROGRAM EMPLOYEE	17. DATE

FSIS FORM 5400-4 (7/98) Replaces FSIS Form 5400-4 (9/97), which may be used until exhausted.(7/98) DISTRIBUTION: Original & 1 copy - Establishment 1 copy - Inspector

U.S. DEPARTMENT OF AGRICULTURE
FOOD SAFETY AND INSPECTION SERVICE

NONCOMPLIANCE RECORD

TYPE OF NONCOMPLIANCE: ☐ Food Safety ☒ Other Consumer Protection

1. DATE	2. RECORD NO.	3. ESTABLISHMENT NO.
1/24/03	3-2003-2539	00085B M / 1

4. TO (*Name and Title*): Larry Corbin, Regulatory Superintendent

5. PERSONNEL NOTIFIED:

6. RELEVANT REGULATION(S): 313

7. RELEVANT SECTION/PAGE OF ESTABLISHMENT PROCEDURE/PLAN	HACCP	SSOP	OTHER
			N/A

8. ISP CODE: 04C02

9. NONCOMPLIANCE CLASSIFICATION INDICATORS

PLANT PROCESS	A. ☐ SSOP	☐ Monitoring	☐ Corrective Action	☐ Recordkeeping	☐ Implementation	
	B. ☐ HACCP	☐ Monitoring	☐ Corrective Action	☐ Recordkeeping	☐ Plant Verification	
C.	☒ PRODUCT	☐ Economic	☐ Misbranding	☒ Protocol		
D.	☐ FACILITY	☐ Lighting	☐ Structural	☐ Outside Premises	☐ Product Based	
E.	☐ E. COLI	☐ Other				

10. DESCRIPTION OF NONCOMPLIANCE:

A conscious pig came through stun procedure and fell off the shackle table and laid on the floor panting. I alerted the supervisor, that he had a conscious pig in this area was busy bleeding pigs. Meanwhile the pig laid on the floor ith shackled pigs swinging down and pummeling it. The supervisor instructed and employee to stun the hog. The employee was unable to properly stun the animal with the line running. I interceded and told the supervisor to shut off the line and stun the pig. proceeded to refuse to stop the line because said they were stunning it. I told again to stop the line and an employee, who was shackling, stopped the line. The pig was then appropriately stunned

11. SIGNATURE OF INSPECTION PROGRAM EMPLOYEE

your right to appeal this decision as delineated by 306.5 and/or 381.35 of 9 CFR.

12. PLANT MANAGEMENT RESPONSE (*Immediate actions(s)*):

Food Safety Corrective Action Report 2003-62 has been completed and is the formal response to this Noncompliance Report

13. PLANT MANAGEMENT RESPONSE (*further planned actions(s)*):

This document serves as written notification that your failure to comply with regulatory requirement(s) could result in additional regulatory or administrative action.

14. SIGNATURE OF PLANT MANAGEMENT	15. DATE
Larry Corbin	2/18/03
16. VERIFICAT PLOYEE	17. DATE 2/18/03

FSIS FORM 5400-4 (7/98) Replaces FSIS Form 5400-4 (9/97), which may be used until exhausted.(7/98) DISTRIBUTION: Original & 1 copy - Establishment 1 copy - Inspector

s.(b)(6)
s.(b)(7)(C)

U.S. DEPARTMENT OF AGRICULTURE
FOOD SAFETY AND INSPECTION SERVICE

NONCOMPLIANCE RECORD CONTINUATION SHEET

TYPE OF NONCOMPLIANCE
☐ Food Safety ☒ Other Consumer Protection

1. DATE	2. RECORD NO.	3. ESTABLISHMENT NO.
1/24/03	3-2003-2539	00085B M / I

4. TO (*Name and Title*)
Larry Corbin, Regulatory Superintendent

5. PERSONNEL NOTIFIED

6. RELEVANT REGULATION(S)
313

7. RELEVANT SECTION/PAGE OF ESTABLISHMENT PROCEDURE/PLAN	HACCP	SSOP	OTHER
			N/A

8. ISP CODE	9. NONCOMPLIANCE INDICATOR
04C02	Product Protocol

10. DESCRIPTION OF NONCOMPLIANCE:

and operations resumed.

11. SIGNATURE OF INSPECTION PROGRAM EMPLOYEE

15. DATE 1-24-03

FSIS FORM 5400-4 (7/95) Replaces FSIS Form 5400-4 (9/97), which may be used until exhausted.(7/98)

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s.(b)(7)(C)

U.S. DEPARTMENT OF AGRICULTURE
FOOD SAFETY AND INSPECTION SERVICE

NONCOMPLIANCE RECORD

TYPE OF NONCOMPLIANCE: ☐ Food Safety ☒ Other Consumer Protection

1. DATE	2. RECORD NO.	3. ESTABLISHMENT NO.
1/15/03	3-2003-2558	18229 M / 1

4. TO (*Name and Title*): Nick Simov, President/GM

5. PERSONNEL NOTIFIED: Nick Simov

6. RELEVANT REGULATION(S): 313.2(f) 313.30

7. RELEVANT SECTION/PAGE OF ESTABLISHMENT PROCEDURE/PLAN	HACCP	SSOP	OTHER
			64, 64d-e (MPI Reqs)

8. ISP CODE: 04C02

9. NONCOMPLIANCE CLASSIFICATION INDICATORS

PLANT PROCESS	A. ☐ SSOP	☐ Monitoring	☐ Corrective Action	☐ Recordkeeping	☐ Implementation	
	B. ☐ HACCP	☐ Monitoring	☐ Corrective Action	☐ Recordkeeping	☐ Plant Verification	
C.	☒ PRODUCT	☐ Economic	☐ Misbranding	☒ Protocol		
D.	☐ FACILITY	☐ Lighting	☐ Structural	☐ Outside Premises	☐ Product Based	
E.	☐ E. COLI	☐ Other				

10. DESCRIPTION OF NONCOMPLIANCE:

While performing daily 04C02 humane slaughter inspection on October 31'st at 11:30 am problems with the stunner developed preventing the pigs from being stunned adequately to induce surgical anesthesia before being shackled. Slaughter operations were stopped while the plant obtained a backup stunner and operations restarted at 2pm and finished at 4pm. The next morning the backup stunner failed and operations were stopped again. The plant obtained a new stunner and training was done by the technician that installed the new stunner and operations began without further incident at 9:15am.

11. SIGNATURE OF INSPECTION PRO [redacted] Dictated but Not Read By

You are hereby advised of your right to appeal this decision as delineated by 306.5 and/or 381.35 of 9 CFR.

12. PLANT MANAGEMENT RESPONSE (*Immediate actions(s)*):

As Above - A Back-up stunner and then a brand New stunner were obtained As Soon as Possible to keep operations going.

13. PLANT MANAGEMENT RESPONSE (*further planned actions(s)*):

Whenever Problems Develop with Stunning Equipment the stunning employee shall Notify the Plant foreman ( ) & Stunning will be stopped Immediately by the Plant.

This document serves as written notification that your failure to comply with regulatory requirement(s) could result in additional regulatory or administrative action.

14. SIGNATURE OF PLANT MANAGEMENT	15. DATE
Nick Simov	01/15/03
16. VERIFI [redacted] JNM	17. DATE 01/15/03

FSIS FORM 5400-4 (7/98) — Replaces FSIS Form 5400-4 (9/97), which may be used until exhausted.(7/98)

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s.(b)(6)

s.(b)(7)(C)

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U.S. DEPARTMENT OF AGRICULTURE
FOOD SAFETY AND INSPECTION SERVICE

NONCOMPLIANCE RECORD

TYPE OF NONCOMPLIANCE: [ ] Food Safety [X] Other Consumer Protection

1. DATE	2. RECORD NO.	3. ESTABLISHMENT NO.
1/13/03	1-2003-2558	18229 M / 1

4. TO (*Name and Title*): Nick Simov, President/GM

5. PERSONNEL NOTIFIED: Nick Simov

6. RELEVANT REGULATION(S): 313.2 (e)

7. RELEVANT SECTION/PAGE OF ESTABLISHMENT PROCEDURE/PLAN	HACCP	SSOP	OTHER
			p.64 regs.

8. ISP CODE: 04C02

9. NONCOMPLIANCE CLASSIFICATION INDICATORS

PLANT PROCESS	A. [ ] SSOP	[ ] Monitoring	[ ] Corrective Action	[ ] Recordkeeping	[ ] Implementation
	B. [ ] HACCP	[ ] Monitoring	[ ] Corrective Action	[ ] Recordkeeping	[ ] Plant Verification
C.	[X] PRODUCT	[ ] Economic	[ ] Misbranding	[X] Protocol	
D.	[ ] FACILITY	[ ] Lighting	[ ] Structural	[ ] Outside Premises	[ ] Product Based
E.	[ ] E. COLI	[ ] Other			

10. DESCRIPTION OF NONCOMPLIANCE:

9:45 AM. While performing Ante-Mortem Inspection, I noticed that no fresh water was available for the livestock. The water tanks for the livestock were also empty. Notified [redacted] and immediate corrective action was made for fresh water availability. This was accomplished before any further livestock was received on the premises, or any performance of ante mortem or, post mortem inspection thereafter..

Federal Regulation pertaining to the humane handling of livestock requires fresh water availability at all times.

11. SIGNATURE OF INSPECTION PROGRAM EMPLOYEE [redacted]

You are hereby advised of your right to appeal this decision as delineated by 306.5 and/or 381.35 of 9 CFR.

12. PLANT MANAGEMENT RESPONSE (*Immediate actions(s)*):

See Above

13. PLANT MANAGEMENT RESPONSE (*further planned actions(s)*):

I talked to Livestock handler about Water for Pigs to be filled at all times

This document serves as written notification that your failure to comply with regulatory requirement(s) could result in additional regulatory or administrative action.

14. SIGNATURE OF PLANT MANAGEMENT: Nick Simov [redacted]

15. DATE: 1/14/03

16. VERIFICA[redacted] PECTION PRO[redacted]

17. DATE: 1/14/03

FSIS FORM 5[redacted] ich may be used until

DISTRIBUTION: Original & 1 copy - Establishment
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U.S. DEPARTMENT OF AGRICULTURE
FOOD SAFETY AND INSPECTION SERVICE

NONCOMPLIANCE RECORD

TYPE OF NONCOMPLIANCE: ☐ Food Safety ☒ Other Consumer Protecti

1. DATE	2. RECORD NO.	3. ESTABLISHMENT NO.
11/18/2003	5-2003-5342	06775 M / 1

4. TO (*Name and Title*): Jim Forbes, President/GM

5. PERSONNEL NOTIFIED: Jim Forbes

6. RELEVANT REGULATION(S): 9 CFR part 313.1 (a)

7. RELEVANT SECTION/PAGE OF ESTABLISHMENT PROCEDURE/PLAN	HACCP	SSOP	OTHER

8. ISP CODE: 04C02

9. NONCOMPLIANCE CLASSIFICATION INDICATORS

PLANT PROCESS	A. ☐ SSOP	☐ Monitoring	☐ Corrective Action	☐ Recordkeeping	☐ Implementation
	B. ☐ HACCP	☐ Monitoring	☐ Corrective Action	☐ Recordkeeping	☐ Plant Verification
C.	☒ PRODUCT	☐ Economic	☐ Misbranding	☒ Protocol	
D.	☐ FACILITY	☐ Lighting	☐ Structural	☐ Outside Premises	☐ Product Based
E.	☐ E. COLI	☐ Other			

10. DESCRIPTION OF NONCOMPLIANCE:

On [redacted] visit to 06775M for Humane Slaughter Verification the following pens were found to have loose boards, splintered, or broken planking (53, 802, 805, 824, 904, 907 920, and 921).

11. SIGNATURE OF INSPECTIO[redacted] DVM

You are hereby advised of your right to appeal this decision as delineated by 500.5 and/or 381.35 of 9 CFR

12. PLANT MANAGEMENT RESPONSE (*Immediate actions(s)*):

Repairs to loose, splintered and broken boards are in process of being repaired.

13. PLANT MANAGEMENT RESPONSE (*further planned actions(s)*):

Plant management will inspect the pens periodically for loose boards, splintered, or broken planking.

This document serves as written notification that your failure to comply with regulatory requirement(s) could result in additional regulatory or administrative action.

14. SIGNATURE OF PLANT MANAGEMENT	15. DATE
James L Forbes	11-28-03
[redacted]TION PROGRAM EMPLOYEE DVM	17. DATE 12-01-03

FSIS FORM 5400-4 (7/98) Replaces FSIS Form 5400-4 (9/97), which may be used until exhausted.(7/98) DISTRIBUTION: Original & 1 copy - Establishment, 1 copy - Inspector

s.(b)(6)
s.(b)(7)(C)

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U.S. DEPARTMENT OF AGRICULTURE
FOOD SAFETY AND INSPECTION SERVICE

NONCOMPLIANCE RECORD

TYPE OF NONCOMPLIANCE: [ ] Food Safety [X] Other Consumer Protecti

1. DATE	2. RECORD NO.	3. ESTABLISHMENT NO.
7/24/2003	12-2003-5313	18229 M / 1

4. TO (*Name and Title*): Nick Simov, President/GM

5. PERSONNEL NOTIFIED:

6. RELEVANT REGULATION(S): 390.30

7. RELEVANT SECTION/PAGE OF ESTABLISHMENT PROCEDURE/PLAN	HACCP	SSOP	OTHER
			(a)(1)(4)

8. ISP CODE: 04C02

9. NONCOMPLIANCE CLASSIFICATION INDICATORS

PLANT PROCESS	A. [ ] SSOP	[ ] Monitoring	[ ] Corrective Action	[ ] Recordkeeping	[ ] Implementation	
	B. [ ] HACCP	[ ] Monitoring	[ ] Corrective Action	[ ] Recordkeeping	[ ] Plant Verification	
C.	[X] PRODUCT	[ ] Economic	[ ] Misbranding	[X] Protocol		
D.	[ ] FACILITY	[ ] Lighting	[ ] Structural	[ ] Outside Premises	[ ] Product Based	
E.	[ ] E. COLI	[ ] Other				

10. DESCRIPTION OF NONCOMPLIANCE:

At approximately 11:10 a.m. while performing procedure 04c02 I observed the following deficiency.
A hog that had been stunned, shackled and hung was still breathing. I touched the hogs eye and it blinked. this lead me to believe the hog was still conscious. I stopped production and notified ado. increased amperage
of stun wand and stunned hog again. I touched eye of hog again
and it did not blink .

11. SIGNATURE OF INSPECTION PROGRAM EMPLOYEE

You are hereby advised of your right to appeal this decision as delineated by 306.5 and/or 381.35 of 9 CFR.

12. PLANT MANAGEMENT RESPONSE *(Immediate actions(s))*:

13. PLANT MANAGEMENT RESPONSE *(further planned actions(s))*:

This document serves as written notification that your failure to comply with regulatory requirement(s) could result in additional regulatory or administrative action.

14. SIGNATURE OF PLANT MANAGEMENT	15. DATE
Nick Simov	
16. VERIFICATION SIGNATURE OF INSPECTION PROGRAM EMPLOYEE	17. DATE

FSIS FORM 5400-4 (7/98) Replaces FSIS Form 5400-4 (9/97), which may be used until exhausted.(7/98) DISTRIBUTION: Original & 1 copy - Establishment 1 copy - Inspector

s.(b)(6)
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This request for this information is voluntary. It is needed to monitor defects found in this inspection system. It is used by FSIS to determine whether establishments are in compliance. 9CFR 301 and 9CFR 381. FORM APPROVED OMB NO. 0583-0089. OMB DISCLOSURE STATEMENT: Public reporting burden for this collection of information is estimated to average 7 minutes per response, including the time for reviewing instructions, searching existing data soures, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, inluding suggestions for reducing this burden, to Department of Agriculture, Clearance Officer, OIRM, Room 404-W, Washington, D.C. 20250; and to the Office of Information and Regulatory Affairs, Office of Management and Budget.

U.S. DEPARTMENT OF AGRICULTURE
FOOD SAFETY AND INSPECTION SERVICE

NONCOMPLIANCE RECORD

TYPE OF NONCOMPLIANCE: [ ] Food Safety [X] Other Consumer Protecti

1. DATE	2. RECORD NO.	3. ESTABLISHMENT NO.
7/28/2003	14-2003-5313	18229 M / 1

4. TO (*Name and Title*): Nick Simov, President/GM

5. PERSONNEL NOTIFIED: Nick Simov

6. RELEVANT REGULATION(S): 390.3

7. RELEVANT SECTION/PAGE OF ESTABLISHMENT PROCEDURE/PLAN	HACCP	SSOP	OTHER

8. ISP CODE: 04C02

9. NONCOMPLIANCE CLASSIFICATION INDICATORS

PLANT PROCESS	A. [ ] SSOP	[ ] Monitoring	[ ] Corrective Action	[ ] Recordkeeping	[ ] Implementation
	B. [ ] HACCP	[ ] Monitoring	[ ] Corrective Action	[ ] Recordkeeping	[ ] Plant Verification
C.	[X] PRODUCT	[ ] Economic	[ ] Misbranding	[X] Protocol	
D.	[ ] FACILITY	[ ] Lighting	[ ] Structural	[ ] Outside Premises	[ ] Product Based
E.	[ ] E. COLI	[ ] Other			

10. DESCRIPTION OF NONCOMPLIANCE:

At approximatly11:05a.m. while performing 04c02 I observed the following deficiency a hog that was hung and stuck but was still breathing. I touched the hogs eye and it blinked. I stopped production notified Nick and of the problem. This is similar in reference to NR# 12-2003-5313 dated 7/24/2003.

11. SIGNATURE OF INSPECTION PROGRAM EMPLOYEE

You are hereby advised of your right to appeal this decision as delineated by 306.5 and/or 381.35 of 9 CFR

12. PLANT MANAGEMENT RESPONSE *(Immediate actions(s))*:

13. PLANT MANAGEMENT RESPONSE *(further planned actions(s))*:

This document serves as written notification that your failure to comply with regulatory requirement(s) could result in additional regulatory or administrative action.

14. SIGNATURE OF PLANT MANAGEMENT	15. DATE
Nick Simov	7/28/03
16. VERIFICATION SIGNATURE OF INSPECTION PROGRAM EMPLOYEE	17. DATE

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U.S. DEPARTMENT OF AGRICULTURE
FOOD SAFETY AND INSPECTION SERVICE

NONCOMPLIANCE RECORD

TYPE OF NONCOMPLIANCE: [ ] Food Safety [X] Other Consumer Protecti

1. DATE	2. RECORD NO.	3. ESTABLISHMENT NO.
7/15/2003	8-2003-5313	18229 M / 1

4. TO (*Name and Title*)	5. PERSONNEL NOTIFIED
Nick Simov, President/GM	Nick Simov

6. RELEVANT REGULATION(S)
313.1

7. RELEVANT SECTION/PAGE OF ESTABLISHMENT PROCEDURE/PLAN	HACCP	SSOP	OTHER
			sec.(a) (e)

8. ISP CODE 04C02

9. NONCOMPLIANCE CLASSIFICATION INDICATORS

PLANT PROCESS	A. [ ] SSOP	[ ] Monitoring	[ ] Corrective Action	[ ] Recordkeeping	[ ] Implementation
	B. [ ] HACCP	[ ] Monitoring	[ ] Corrective Action	[ ] Recordkeeping	[ ] Plant Verification
C.	[X] PRODUCT	[ ] Economic	[ ] Misbranding	[X] Protocol	
D.	[ ] FACILITY	[ ] Lighting	[ ] Structural	[ ] Outside Premises	[ ] Product Based
E.	[ ] E. COLI	[ ] Other			

10. DESCRIPTION OF NONCOMPLIANCE:

While performing 04C02Idiscoveredthefollowingdeficiencies.(1)Holding pens did not have ample amount of water for hogs being held. Also to many hogs in each pen to allow hogs to rest. This is a repeat of NR#00016-01.(2)Stainless steal around doorway leading from holding pens to stunning area and lower walls near floor of stunning area have sharp

11. SIGNATURE OF INSPECTION PROGRAM EMPLOYEE

You are hereby advised of your right to appeal this decision as delineated by FSIS Directive 8410.1 of 9CFR

12. PLANT MANAGEMENT RESPONSE *(Immediate actions(s))*:

13. PLANT MANAGEMENT RESPONSE *(further planned actions(s))*:

This document serves as written notification that your failure to comply with regulatory requirement(s) could result in additional regulatory or administrative action.

14. SIGNATURE OF PLANT MANAGEMENT	15. DATE
16. VERIFICATION SIGNATURE OF INSPECTION PROGRAM EMPLOYEE	17. DATE

FSIS FORM 5400-4 (7/98) — Replaces FSIS Form 5400-4 (9/97), which may be used until exhausted (7/98) — DISTRIBUTION: Original & 1 copy - Establishment, 1 copy - Inspector

s.(b)(6)
s.(b)(7)(C)

U.S. DEPARTMENT OF AGRICULTURE
FOOD SAFETY AND INSPECTION SERVICE

NONCOMPLIANCE RECORD CONTINUATION SHEET

TYPE OF NONCOMPLIANCE
☐ Food Safety ☒ Other Consumer Protection

1. DATE	2. RECORD NO.	3. ESTABLISHMENT NO.
7/15/2003	8-2003-5313	18229 M / 1

4. TO (*Name and Title*)	5. PERSONNEL NOTIFIED
Nick Simov, President/GM	Nick Simov

6. RELEVANT REGULATION(S)
313.1

7. RELEVANT SECTION/PAGE OF ESTABLISHMENT PROCEDURE/PLAN	HACCP	SSOP	OTHER
			sec.(a) (e)

8. ISP CODE	9. NONCOMPLIANCE INDICATOR
04C02	Product Protocol

10. DESCRIPTION OF NONCOMPLIANCE:

and projecting pieces which may cause injury or pain to animals. Repeat of NR#4-2002-2550

11. SIGNATURE OF INSPECTION PROGRAM EMPLOYEE	15. DATE

FSIS FORM 5400-4 (7/98) Replaces FSIS Form 5400-4 (9/97), which may be used until exhausted.(7/98) DISTRIBUTION: Original & 1 copy - Establishment 1 copy - inspector

0: 926 M/1000187 09 / 09 / 2003 04C02 I 0005-2003-2443 Frank Faso, President/GM

While performing 04C02 inspection duties Inspector and I observed a hog hanging from its back leg on the chain still conscious (kicking, squeeling and looking around) after it had been through the stunner. I stopped the line and informed Frank Faso.

18229 M/1	01 / 15 / 2003	04C02	I	0003-2003-2558	[redacted]	Nick Simov, President/GM

Attachment D January 1st - September 30, 2003

000475

000188

Page: 1

Run Date: 10 / 03 / 200: 9:05:0

NR Summary Report

1st	Shift	/Description	Date	Procedure	Result	NR Number	IIC	Appealed?	ReportTo	Open?
		While performing daily 04C02 humane slaughter inspection on October 31'st at 11:30 am problems with the stunner developed preventing the pigs from being stunned adequately to induce surgical anesthesia before being shackled. Slaughter operations were stopped while the plant obtained a backup stunner and operations restarted at 2pm and finished at 4pm. The next morning the backup stunner failed and operations were stopped again. The plant obtained a new stunner and training was done by the technician that installed the new stunner and operations began without further incident at 9:15am.								
132 9	M/1		07 / 15 / 2003	04C02	I	0008-2003-5313			Nick Simov, President/GM	s.(b)(4) s.(b)(6) s.(b)(7)(C)
		While performing 04C02Idiscoveredthefollowingdeficiencies.(1)Holding pens did not have ample amount of water for hogs being held. Also to many hogs in each pen to allow hogs to rest. This is a repeat of NR#00016-01.(2)Stainless steal around doorway leading from holding pens to stunning area and lower walls near floor of stunning area have sharp and projecting pieces which may cause injury or pain to animals. Repeat of NR#4-2002-2550								
8:29	M/1		07 / 24 / 2003	04C02	I	0012-2003-5313			Nick Simov, President/GM	
		At approximately 11:10 a.m. while performing procedure 04c02 I observed the following deficiency. A hog that had been stunned, shackled and hung was still breathing. I touched the hogs eye and it blinked. this lead me to believe the hog was still conscious. I stopped production and notified increased amperage of stun wand and stunned hog again. I touched eye of hog again and it did not blink .								
18:29	M/1	000189	07 / 28 / 2003	04C02	I	0014-2003-5313			Nick Simov, President/GM	
		At approximatly11:05a.m. while performing 04c02 I observed the following deficiency a hog that was hung and stuck but was still breathing. I touched the hogs eye and it blinked. I stopped production notified Nick and of the problem. This is similar in reference to NR# 12-2003-5313 dated 7/24/2003.								

NR Summary Report

s.(b)(4)
s.(b)(6)
s.(b)(7)(C)

Est/Shift /Description	Date	Procedure	Result	NR Number	IIC	Appealed?	ReportTo	Open?
00085B M/1	01 / 24 / 2003	04C02	I	0003-2003-2539			Larry Corbin, Regulatory Superintendent	

A conscious pig came through stun procedure and fell off the shackle table and laid on the floor panting. I alerted the supervisor, that had a conscious pig in this area. was busy bleeding pigs. Meanwhile the pig laid on the floor with shackled pigs swinging down and pummeling it. The supervisor instructed and employee to stun the hog. The employee was unable to properly stun the animal with the line running. I interceded and told the supervisor to shut off the line and stun the pig. proceeded to refuse to stop the line because said they were stunning it. I told again to stop the line and an employee, who was shackling, stopped the line. The pig was then appropriately stunned and operations resumed.

00085B M/1	06 / 04 / 2003	04C02	I	0026-2003-4036			Larry Corbin, Regulatory Superintendent	

At approximately 1005 while performing inspection procedure 04CO2 in the suspect or FS-3 conditions pen I observed a plant employee applying an electrical stunning device to 2 hogs. The employee applied the device in such a manner that the quality and location of the electrical shock did not produce immediate insensibility to pain. The employee applied the device incorrectly several times to the 2 hogs. The 2 hogs jumped and squealed upon each incorrect application of the electrical shock. I stopped the employee's actions.I walked to the and instructed the plant employees to stop any additional hogs from entering the .I asked the employee to contact a supervisor . I notified of the deficiency. I asked him for a corrective action The corrective action was to re-train the employee,and provide another employee to stun who was properly trained in hand stunning. I allowed the plant to resume stunning.

00085B M/1	08 / 18 / 2003	04C02	I	0072-2003-5471			Larry Corbin, Regulatory Superintendent	

At 0715, Dr. Huette and I observed the suspect pen, full of suspects, without any water available to drink. notified of the problem.

00085B M/1	08 / 19 / 2003	04C02	I	0073-2003-5471			Larry Corbin, Regulatory Superintendent	

At 10:15 and I observed a plant employee applying an electrical stunning device to a hog. The employee applied the device in such a manner that the quality and location of the electrical shock did not produce immediate insensibility to pain. The hog jumped and squealed upon each incorrect application of the electrical shock. nformed supervisor of the non-compliance. Production was stopped by rejecting entrance to the butinas using tags numbered B35521146 and B35521147. During a meeting with and Larry Corbin a preventative measure was discussed. The decision was made to properly restrain hogs prior to application of the electrical stunning device. After reviewing the preventative measure, production was allowed to resume. A similar NR numbered 26-2003-4036 was documented on 6/4/03. The previous preventative action has not been effective. Failure to meet regulatory requirements could result in further enforcement actions.

00085B M/1	08 / 20 / 2003	04C02	I	0075-2003-5471			Larry Corbin, Regulatory Superintendent	

At 0615 I observed a hog with it's head stuck in an opening of a sorting gate in pen #18 - 22. I notified establishment employee of the problem. stated that there was no easy way to remove the hog from the gate. He then proceeded to try forcefully, numerous times, to ram the hogs head back through the gate with his foot. I told Mr. Wubker to stop. He then said he was going to get the stunner. While I was waiting for to come back, another employee walked up and grabbed the hog by it's back legs and turned the hog on it's side. This action released the hog's head from the opening in the sorting gate. I notified of the noncompliance. I returned to the government office and notified and I immediately contacted and met with and to discuss a preventive measure.

00085B M/1	08 / 25 / 2003	04C02	I	0080-2003-5471			Larry Corbin, Regulatory Superintendent	

At approximately 0925 on August 25, 2003 I observed a non-ambulatory hog lying in an unloading dock. Hogs were being driven from the truck. Many hogs were walking and running on top of the down hog. I stopped the truck driver from unloading the truck. I notified inspector of the noncompliance and asked to go to the stunning area and stop the stunning process. I notified company supervisor of the noncompliance and of the tagging of the CO2 entrances. A company employee stunned the non-ambulatory hog using a captive bolt gun. Plant manager Steve Pirkle gave the following preventative measures: 1) Install video cameras in the unloading docks 2) Monitor and verify truck drivers in the unloading process 3) Require a sign off sheet for all truck drivers stating that they understand and have been trained in humane handling practices. 4) Instruct all livestock handling employees to remove or stun any non-ambulatory hogs when they first become aware of their presence. Kill floor down time as a result of this noncompliance was approximately 1 hour.

00085B M/1	09 / 11 / 2003	04C02	I	0096-2003-5471			Larry Corbin, Regulatory Superintendent	

NR Summary Report

Est	Shift	/Description	Date	Procedure	Result	NR Number	IIC	Appealed?	ReportTo	Open?

On 9/11/2003 inspector was performing the ante-mortem duties. At 09:45 he performed ante-mortem inspection on pens 16 thru 20, they were released for slaughter. At 12:50 went back to do ante-mortem on the pens 16 thru 20 for the second group of animals, observed that the employees were empting these pens and taking them to the slaughter floor. Inspector then returned to the scale office to make sure the pen numbers were correct on the pen card for 16 thru 20. The scale office confirmed that the ante-mortem card for pen 16 thru 20 was correct. Inspector had not performed ante-mortem on the pens 16 thru 20 on the second group. then went to the butinas. There was no supervisor in the area at that time. instructed employees to stop the slaughter process at 13:00 hours. Supervisor came to the area and was told that the animals being slaughtered had not had ante-mortem inspection performed prior to slaughter. In the second group of hogs in pens 16 thru 20 there were head in those pens. By the time slaughter was stopped, approximately hogs were slaughtered without ante-mortem inspection performed prior to slaughter.

(*)0085B	M/1		09 / 17 / 2003	04C02	I	0103-2003-5471			Regulatory Superintendent	Yes

At approximately 0745 Inspector was performing inspection procedure 04C02 in the stunning area. observed several hogs kicking and gasping as they exited the CO2 chamber. Supervisor was in the area. notified of the unusual movements. Inspector observed no signs of consciousness such as rhythmic breathing, vocalizing, righting reflex or corneal reflex. returned to the USDA office and informed me of the unusual movements present in the normallymotionless animals. At approximately 0800 I walked to the stunning area. I observed a hog hanging on the bleed chain exhibiting a righting reflex and gasping. I asked to contact establishment personnel to properly stun the hog. I asked to stop the stunning of hogs by tagging the entrance to the ! Approximately two minutes later operations manager, arrived at my location. I questioned me concerning the hog's state of consciousness, as observed the ho g was only gasping at this point in time. I explained to I that at the time of my first observation of the hog, it was exhibiting a righting reflex which is evidence of consciousness. stated that he had observed this hog on the bleed chain approximately 20 yards prior to my observation point and saw only a limp unconscious animal. then instructed the employee standing by to utilize the captive bolt device to stun the hog. I walked to the CO2 chamber area. I was told by Supervisor that the on the west side had not been used for a period of time today because it was not functioning properly. The on the east side was now not functioning properly. informed me that between 0730 and 0800 became aware of the improperly functioning east as evidence by one hog on the shackle table showing signs of consciousness(i.e. blinking), and one hog on the shackle table that was actually conscious. old me that stopped the stunning pr

00085B	M/2		08 / 26 / 2003	04C02	I	0081-2003-5471			Regulatory Superintendent	

At approximately 1620 on August 26, 2003 I observed a non-ambulatory hog lying in an unloading dock. Two hogs that had been previously unloaded re-entered the truck. The truck driver was in the truck dragging dead hogs to the side door and pushing them out of the truck. The truck driver saw the two hogs re-enter the truck and drove the hogs back down the ramp. One of the hogs ran over the non-ambulatory hog as it was being driven from the truck. The truck driver in the adjacent dock ran to stop the hog from being run over.

was unable to stop the hog. I told the truck driver to stop unloading truck until establishment employees removed the non-ambulatory hog from the area. I notified of the noncompliance. I told that I would suspend stunning at this time. I walked to the stunning area and told the establishment employees to stop driving hogs into the CO2 chambers. The entrances to the CO2 chambers were rejected with tag numbers B35521167 and B355211168 at 1630. The Chicago District Office was notified of the noncompliance. I met with operations manager I to discuss the noncompliance.

Similar noncompliance was documented on NR 80-2003-5471 dated 8/25/2003.

00085B	M/2		08 / 29 / 2003	04C02	I	0088-2003-5471			Regulatory Superintendent	

NR Summary Report

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s.(b)(7)(C)

Est	Shift	/Description	Date	Procedure	Result	NR Number	IIC	Appealed?	ReportTo	Open?

At approximately 1500 on 08/29/03, inspector [redacted] and I were in the livestock unloading dock area observing establishment activities. At approximately 1530 we observed establishment employees stun several non-ambulatory hogs in the unloading dock area approximately 15 feet from our location. The employees stunned the animals using a penetrating captive bolt device. At approximately 1545 I walked to the unloading dock area where the hogs had been stunned. I observed the following in that area.1). Two establishment employees were standing, talking casually among several hogs. Some hogs were ambulatory, some hogs were dead. One hog was down and conscious, as evidenced by blinking and rhythmic breathing. The down hog had blood running from it's nostrils and from it's head behind the right ear. As it lay in lateral recumbency, it's body trembled. Livestock manager [redacted] was in the area. I showed [redacted] the hog and asked [redacted] to have the hog restunned immediately. There wasn't an employee in the large unloading dock area that had any stunning device in their possession. In approximately 5 minutes, an employee brought a penetrating captive bolt stunning device to the area and I observed [redacted] properly stun the conscious animal. Regulatory control action was taken by stopping the stunning process at the butina entrance. Operations manager [redacted] gave the following preventive measures. 1) New penetrating captive bolt stunning devices will be available for use next week. 2) Employees will be trained in recognition of properly stunned animals. They will be instructed to stay with the stunned animals until they are certain that they are dead. 3) Gave assurance that any employee carrying out a stunning procedure will carry a back-up device as previously stated by the establishment. This back-up device will be used in case of malfunction of the first device. [redacted] was hopeful that in the future these preventive measures would prevent both mechanical and operator error. Productionw

06775	M/1		02 / 20 / 2003	04C02	I	0002-2003-2423	[redacted]		Jim Forbes, President/GM	

On February 20,2003 at 10:35am Circuit Supervisor, [redacted] observed a load of swine (boars and sows) being unloaded at Calihan Pork Processors. [redacted] observed several disabled animals being pulled from the truck. Operations were immediately stopped and Mr. Jim Forbes, General Manager was notified. At this time a meeting was held with [redacted] Circuit Supervisor-USDA; [redacted] IIC-Est.06775M-USDA; Jim Forbes,General Manager-Calihan Pork Processor and [redacted] and agreement was met. A letter was issued to the USDA and operations resumed. There was downtime of 20 minutes.

NR Summary Report

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Est/Shift /Description	Date	Procedure	Result	NR Number	IIC	Appealed?	ReportTo	Open?
0600 M/1	01 / 02 / 2003	04C02	I	0001-2003-2568			Mr. Jim Sowinski, Plant Manager	

On Jan.2,2003 at @ 0620 while I was performing antemortem inspection, noticed a plant employee dragging a disabled calf from the truck exit door to the pen on the rough ramp. the calf was tied by his hind legs. I immediately stopped the dragging and informed the foreman about this non- compliance of the brutely dragging of disabled animals. THe foreman left the scene, instead of taking a corrective action as to load this said animal on the special cart used for such disabled animal. On the other hand the plant employee kept dragging the animal to the suspect pen.
This non-compliance of inhumane handling of livestock calls for a regulatory control action based on 9CFR 500.2, a tag # b19553121 was applied to the pen/kill floor entance and the was sopped. Similar N/Rs were issued no.s#16/02-46/02-43/02-and 37/02.

0851 M/1	02 / 19 / 2003	04C02	I	0005-2003-2775			David Follenweider, V.P.	

At approx. 1050hrs observed approx. 10 calves in the outdoor holding pen. These calves did not have access to water as is required be above cited regulation.

0851 M/1	07 / 31 / 2003	04C02	I	0025-2003-5263			David Follenweider, V.P.	

While conducting an unscheduled 04C02 on 07/31/03 in the livestock pens I noticed that the concrete curbing in the outdoor pen is broken with jagged edges. This poses an injury hazard to the calves feet and other areas of the body especially if they are forced to lie down on the broken concrete. A U.S. Rejected tag has been applied to the outdoor pen to prevent it's use until it is repaired. As the above Regulation states the livestock pens have to be constructed and maintained in good repair to prevent injury to the animals and maintain compliance with the Humane Slaughter laws.

1550 2 M/1	02 / 12 / 2003	04C02	I	0001-2003-2508			Ed Oedzes, President/GM	Yes

At approximately 1100, 2-6-03, during a review by Circuit 5013 Supervisor, observation was made of several small calves slipping on the unloading ramp. Mr. Oedzes was informed of failure to meet the requirements of 9CFR 313.1{b} of the Federal Meat Regulations

NR Summary Report

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Est	Shift	/Description	Date	Procedure	Result	NR Number	IIC	Appealed?	ReportTo	Open?
0915	M/1		05 / 06 / 2003	04C02	I	0011-2003-2764			Jim Fisher, General Manager	

During the first half-shift of slaughter operations on 5/6/03, was performing antemortem inspection on formula-fed veal calves presented by the establishment and observed the following noncompliance with humane slaughter regulations. could see that 3 of the approximately 8 antemortem pens had circular-shaped water drains in the floor that were covered with oversized rectangular-shaped iron or steel grates. Calves were observed tripping on the grates. The edges and corners of the grates present sharp surfaces, which project above the floor and in opinion may cause injury or pain to animals under inspection. 9CFR 313.1(a) states, "Livestock pens, driveways and ramps shall be maintained in good repair. They shall be free from sharp or protruding objects which may, in the opinion of the inspector, cause injury or pain to the animals." also observed that more than one animal in more than one location got its head caught in the spacing between the metal bars of which the pen partitions and gates are made or in excess spacing between the ends of swinging gates and where they are temporarily attached to a fixed partition. This condition unnecessarily allows for calves to be injured. 9CFR 313.1(a) states, "unnecessary openings where the head, feet, or legs of an animal may be injured shall be repaired."

informed production manager and General Manager Jim Fisher of the above regulatory noncompliances. gave assurances that the condition of the drain grates would be corrected by Saturday 5/10/03. Mr. Fisher gave assurance that the bar spacing problem would be corrected in upcoming months by a project currently in planning stages for complete renovation of the antemortem area in the establishment.

NR Summary Report

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] st Shift /Description	Date	Procedure	Result	NR Number	IIC	Appealed?	ReportTo	Open?
0-)2-44I M/1	06 / 03 / 2003	04C02	I	0065-2003-2889		Yes	Darrell Schmidt, President/GM	

At approximately 0930 hours, while conducting a humane handling audit in the barn, DVMS, and IIC, identified several areas of disrepair in the unloading area. At the back of pen six, there is a large jagged opening, approximately 3 feet long by 4 inches wide, in the metal wall covering. At the back of pen four, there is a broken-off metal pipe. There is a jagged tear in the metal plate on the gate in the main drive alley between pens three and four. In the west shipper-hog pen, there are sharp edges present on the bottom of the metal plates attached to one side of the pen. informed verbally and in writing of this failure to comply with regulatory requirements.

(02 44I M/1	07 / 03 / 2003	04C02	I	0079-2003-2602			Darrell Schmidt, Plant Manager	

At approximately 0740 hours, while performing antemortem inspection in the barn, IIC, heard a loud squeal then observed a "subject" hog fall from the bucket of a bobcat, positioned just past the scales, to the cement floor of the main drive alley, a distance of approximately 4-5 vertical feet. The hog stood, walked several feet down the alleyway, then collapsed. immediately rejected the bobcat with USDA Retain/Reject tag #B35944565. Hog Buyer, was notified of the violation of humane handling requirements. The incident was also witnessed by 2 maintenance and at least 5 barn personnel. Per 9 CFR 500, suspended production without providing prior notification until provided with immediate and corrective action and further planned preventive action by Superintendent, a period of approximately 15 minutes. was notified verbally and in writing of the failure to comply with humane handling regulatory requirements. Failure to comply with regulatory requirements could result in additional regulatory or administrative action. (65-2003-2889, 06/03/2003)

0(:44I M/1	08 / 15 / 2003	04C02	I	0101-2003-2602		Yes	Darrell Schmidt, Plant Manager	Yes

At approximately 1155 hours while in the stick area, IIC, observed a hog move behind the company person stunning hogs then fall and/or jump from the stun area platform to the cement floor, a distance of approximately 4 vertical feet. Upon falling, the hog's back feet became tangled in a nearby yellow hose. After disentangling itself, it stood and was walked back to the drive alley. Per 9 CFR 500, I stopped the stunning of any additional hogs until provided with immediate corrective action and further planned preventive actions. Superintendent, was notified, among others, of the violation of humane handling requirements. Failure to comply with regulatory requirements could result in additional regulatory or administrative action. (79-2003-2602, 07/03/2003)

)0 44I M/2	08 / 29 / 2003	04C02	A	0110-2003-2889		Yes	Darrell Schmidt, Plant Manager	Yes

On Saturday, August 30, 2003, at approximately 0035 hours, entered the USDA suspect pen to examine 8 "subject" hogs whereupon noticed that the water trough was empty. immediately notified and of the humane handling violation. examined the water trough and confirmed the deficiency. informed that as an immediate corrective action, the water valve used to fill the water trough would be left on continuously during the shift. then signed for and released the hogs in the suspect pen for regular slaughter at 0045. 9 CFR 313.2 (e) clearly states that "Animals shall have access to water in all holding pens and, if held longer than 24 hours, access to feed." Failure to comply with regulatory requirements could result in additional regulatory or administrative action. A similar (humane handling) NR was issued on 08/15/03 (NR# 101-2003-2602; under appeal).

0)3 '2	M/1	. 04 / 17 / 2003	04C02	I	0012-2003-2952	William D. Contris, President/General manager	Yes

While performing antemortem on animals from a truckdriver was observed striking a sow with a metal crowbar on the rear hind quarter. The sow was down on the ramp and had her rear leg caught between the ramp and the trailer of the truck. The truckdriver was ordered to cease striking of the downed sow and the inspector was called an "asshole" and asked if would like to move the sow off the ramp by Antemortem was suspended at this time and the inspector immediately contacted the plant manager, Brian Contris, to deal with the behavior of the truckdriver. This is a violation of Humane Methods of Slaughter Act and 9 CFR 313 of the regulations.

00818 M/1 03 / 18 / 2003 04C02 I 0060-2003-2495 [redacted] David Stearns, Plant Manager

Shortly after 11:30 A.M., I was called to the barn for ante mortem. Just outside the livestock office, I observed an employee (wearing a hooded sweatshirt) repeatedly slashing a hog with a hatchet. The hog was conscious. His eyes were open and he was alert. He was lifting his head and neck from the ground. I did not notice any blood on the hog's face (i.e. no indication the hog had been shot in the forehead) .

I put a withholding action without prior notification in place prior to the hog restrainer (B31981944). I then notified [redacted] Quality Control.

The Humane Slaughter Act requires that livestock be rendered insensible to pain before being shackled, hoisted, thrown, cast, or cut.

Regulations require that the caliber of firearms be such that when properly aimed and discharged, the projectile produces immediate unconsciousness.

00318 M/1 05 / 20 / 2003 04C02 I 0094-2003-2495 [redacted] David Stearns, Exec. V.P./C.O.O.

While performing ante mortem inspection around 0545, Inspector [redacted] noticed their was no water available for the hogs in the suspect pen.

9 CFR 313 deals with humane slaughter of livestock and it requires that livestock have access to water in all holding pens.

Plant personnel failed to meet this requirement.

01664 M/1 08 / 12 / 2003 04C02 I 0024-2003-5440 [redacted] Kris Kah, President/GM Yes

On 8/12/03 while making a observation of the holding pens area to verify compliance with the humane slaughter of livestock, I observed that neither pen that contained hogs and cattle had available water nor water containers. This finding represents noncompliance with humane slaughter regulation 313.2(e) which states animals shall have access to water in all holding pens and , if held longer that 24 hours access to feed. Kris Kah notified and corrective actions initiated. This is a repeat noncompliance with regulation 313.2(e), see noncompliance report 12-2002-2564 dated 12/11/02.

5814	M/1	08 / 28 / 2003	04C02	I	0010-2003-5251	Gregg Baker, President/GM	Yes

On 08/28/2003 while performing procedure 04C02 which is designed to ensure proper humane handling procedures as specified by 9CFR313, I chose to observe the unloading of live sows from a semi-trailer truck. The truck is normally backed up to a ramp, provided by the company, which is elevated in order to accept loads from the back of a semi trailer. As I was watching the handler drive the livestock from the trailer to the elevated portion of the ramp, I noticed several animals get their legs caught between the floor of the wooden ramp and the bottom side rail of the ramp with at least one animal nearly breaking a leg trying to remove it from the opening. The animals were obviously (vocally) distressed by this. On further examination of the ramp, I noticed loose footing boards and nail heads protruding from the floor of the ramp.

With this situation, there exists a non-compliance with 9CFR313(a) which specifically addresses the maintenance and repair of pens, driveways, and ramps which represents a failure to handle livestock in a humane manner. A corrective action regarding this issue should be implemented as soon as possible.

8691	M/1	04 / 01 / 2003	04C02	I	0002-2003-2378	Keith Landes, President/GM	

While performing anti-mortem inspections, I observed that the water pans were all in the ally way. I tested the pans to see if the hogs had pushed them outside the pens. The pans could not be pushed under the gates. I then open the gates to a couple of the pens and put the pans inside. The hogs started to drink immediately. This did not meet the requirements for humane slaughter. Livestock must have access to water if held for twenty four hours.

NR Summary Report

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Est	Shift	/Description	Date	Procedure	Result	NR Number	IIC	Appealed?	ReportTo	Open?
7496	M/1		03 / 12 / 2003	04C02	I	0006-2003-3896			Ronald Buncich, President/GM	

At 0900 hours I went to observe the stunning/bleeding procedure. As I looked into the stunning area I observed an employee standing, with both feet, on a downed stunned hog. The employees then shackled & hoisted it over to the sticking area. I then observed a live conscious hog laying under the scald tank in the bleeding area. Upon seeing me, the sticker then asked the stunning crew for the hoist chain. proceeded to shackle the awake hog by the front leg & directed the stunning crew on dragging the hog out from under the scald tank and took several attempts in hoisting this awake hog over the gate back to the stunning area as the chain got caught in the gate & sterilizer. The hog was restunned, hoisted & stuck. At this time came over to the area & I explained what I observed. said the hog had kicked itself off the shackle the 1st time.

These are both inhumane actions in the stunning/bleeding procedure. The conscious hog should have been stunned prior to trying to drag it out from under the scald tank.

This is a repeat deficiency. See NR 7-2002 dated 10/29/02.

7496	M/1		03 / 26 / 2003	04C02	I	0008-2003-2482			Ronald Buncich, President/GM	

At 08:59 hours I went to observe the human slaughter procedure. I observed the plant employee stun one hog while another hog had already been stunned and was laying on the floor. The employee then hoisted the second stunned hog to the rail for sticking while the first stunned hog was still laying on the floor. The first stunned hog was then hoisted to the rail for sticking. The correct procedure for stunning is to stun one hog only, shackle and lift it, to send it to the bleeding area and then to proceed with stunning the next hog. As I was watching the stunning procedure Ron Buncich walked up. I relayed to him what I had observed. He notified to talk to the employee to find out why had stunned 2 hogs before hoisting them to the rail for sticking. I do not know what the employee told

U.S. DEPARTMENT OF AGRICULTURE
FOOD SAFETY AND INSPECTION SERVICE

NONCOMPLIANCE RECORD

TYPE OF NONCOMPLIANCE: ☐ Food Safety ☒ Other Consumer Protection

1. DATE	2. RECORD NO.	3. ESTABLISHMENT NO.
12/4/02	12-2002-3984	17564 M/2

4. TO (*Name and Title*) DZ AT
Gary Jacobson/~~J. D. Reed, President~~/GM

5. PERSONNEL NOTIFIED

6. RELEVANT REGULATION(S)
313.30

7. RELEVANT SECTION/PAGE OF ESTABLISHMENT PROCEDURE/PLAN	HACCP	SSOP	OTHER
			X

8. ISP CODE 04C02

9. NONCOMPLIANCE CLASSIFICATION INDICATORS

PLANT PROCESS	A. ☐ SSOP	☐ Monitoring	☐ Corrective Action	☐ Recordkeeping	☐ Implementation
	B. ☐ HACCP	☐ Monitoring	☐ Corrective Action	☐ Recordkeeping	☐ Plant Verification
C.	☒ PRODUCT	☐ Economic	☐ Misbranding	☒ Protocol	
D.	☐ FACILITY	☐ Lighting	☐ Structural	☐ Outside Premises	☐ Product Based
E.	☐ E. COLI	☐ Other			

10. DESCRIPTION OF NONCOMPLIANCE:

On 12/04/02 at approximately 2315 at the veterinary disposition area, three hogs were railed out by FSIS inspection staff personnel. Upon [redacted] inspection of the carcasses, I determined that all three have not been properly stuck. One was not stuck at all. Earlier in the shift, three other carcasses were railed out with the same cause. One of those three was a no stick as well, making it a total of six carcasses. [redacted] informed [redacted] verbally of the establishment's inhumane handling of the animals and of the impending noncompliance record. NR number 12-2002-2585 was written for inhumane handling on 12/02/02.

11. SIGNATURE OF IN[redacted]

You are hereby advised of your right to appeal this decision as described by 9 CFR [illegible] and/or 381.35 of 9 CFR.

12. PLANT MANAGEMENT RESPONSE *(Immediate actions(s))*:

13. PLANT MANAGEMENT RESPONSE *(further planned actions(s))*:

This document serves as written notification that your failure to comply with regulatory requirement(s) could result in additional regulatory or administrative action.

14. SIGNATURE OF PLANT MANAGEMENT	15. DATE
16. VERIFICATION SIGNATURE OF INSPECTION PROGRAM EMPLOYEE	17. DATE

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compliance 9CFR 301 and 9CFR 381. FORM APPROVED OMB NO. 0583-

estimated to average 7 minutes per response, including the time for reviewing instructions, searching existing data soures, gainering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Department of Agriculture, Clearance Officer, OIRM, Room 404-W, Washington, D.C. 20250; and to the Office of Information and Regulatory Affairs, Office of Management and Budget.

U.S. DEPARTMENT OF AGRICULTURE
FOOD SAFETY AND INSPECTION SERVICE

NONCOMPLIANCE RECORD

TYPE OF NONCOMPLIANCE: ☐ Food Safety ☒ Other Consumer Protection

1. DATE	2. RECORD NO.	3. ESTABLISHMENT NO.
12/2/02	12-2002-2585	17564 M / 2

4. TO (*Name and Title*): Gary Jacobson/J. D. Reed, President/GM

5. PERSONNEL NOTIFIED:

6. RELEVANT REGULATION(S): 9CFR313, Dir. 6900-1

7. RELEVANT SECTION/PAGE OF ESTABLISHMENT PROCEDURE/PLAN	HACCP	SSOP	OTHER
			N/A

8. ISP CODE: 04C02

9. NONCOMPLIANCE CLASSIFICATION INDICATORS

PLANT PROCESS	A. ☐ SSOP	☐ Monitoring	☐ Corrective Action	☐ Recordkeeping	☐ Implementation	
	B. ☐ HACCP	☐ Monitoring	☐ Corrective Action	☐ Recordkeeping	☐ Plant Verification	
C.	☒ PRODUCT	☐ Economic	☐ Misbranding	☒ Protocol		
D.	☐ FACILITY	☐ Lighting	☐ Structural	☐ Outside Premises	☐ Product Based	
E.	☐ E. COLI	☐ Other				

10. DESCRIPTION OF NONCOMPLIANCE:

At approximately 2100 hrs. while in the hog stunning and sticking area Inspector observed a hog on the bleed table that had rhythmic breathing and eye movement. The stick table was stopped, upon further investigation Inspector observed another two hogs, one on the floor and also on the stick table with the same sign's. The three hogs were then properly stunned. There was approximately 5 minutes of down time. was informed verbally and in writing of impending NR.

11. SIGNATURE OF INSPECTION PI

You are hereby advised of your right to appeal this decision as delineated by 306.5 and/or 381.35 of 9 CFR.

12. PLANT MANAGEMENT RESPONSE *(Immediate actions(s))*:

13. PLANT MANAGEMENT RESPONSE *(further planned actions(s))*:

This document serves as written notification that your failure to comply with regulatory requirement(s) could result in additional regulatory or administrative action.

14. SIGNATURE OF PLANT MANAGEMENT	15. DATE
16. VERIFICATION SIGNATURE OF INSPECTION PROGRAM EMPLOYEE	17. DATE

FSIS FORM 5400-4 (7/98) — Replaces FSIS Form 5400-4 (9/97), which may be used until exhausted.(7/98) — DISTRIBUTION: Original & 1 copy - Establishr, 1 copy - Inspector

U.S. DEPARTMENT OF AGRICULTURE
FOOD SAFETY AND INSPECTION SERVICE

NONCOMPLIANCE RECORD

TYPE OF NONCOMPLIANCE: ☐ Food Safety ☒ Other Consumer Protection

1. DATE	2. RECORD NO.	3. ESTABLISHMENT NO.
9/5/02	32-2002-2517	00717M M / 1

4. TO (Name and Title): Terry Orness, Plant Manager

5. PERSONNEL NOTIFIED: [redacted]

6. RELEVANT REGULATION(S): Directive 6900.1

7. RELEVANT SECTION/PAGE OF ESTABLISHMENT PROCEDURE/PLAN	HACCP	SSOP	OTHER
			N/A

8. ISP CODE: 04C02

9. NONCOMPLIANCE CLASSIFICATION INDICATORS

PLANT PROCESS	A. ☐ SSOP	☐ Monitoring	☐ Corrective Action	☐ Recordkeeping	☐ Implementation	
	B. ☐ HACCP	☐ Monitoring	☐ Corrective Action	☐ Recordkeeping	☐ Plant Verification	
C.	☒ PRODUCT	☐ Economic	☐ Misbranding	☒ Protocol		
D.	☐ FACILITY	☐ Lighting	☐ Structural	☐ Outside Premises	☐ Product Based	
E.	☐ E. COLI	☐ Other				

10. DESCRIPTION OF NONCOMPLIANCE:

[redacted]ring antemortem inspection at 0745 I observed an employee stun a U.S. Suspect hog. The employee determined that the first attempt at stunning did not render the animal unconscious and proceeded to apply the stun wand again. The hoist was brought over and the animal was shackled and hoisted. The animal passed by three employees and was being taken to the stick area when I intervened and showed the employees that the animal was still conscious. The animal had a blink response and a regular breathing pattern. The employee lowered the animal to the ground and applied the stun wand again. This time the animal was rendered unconscious. Operations were not stopped. I

11. SIGNATURE OF INSPECTION PROGRAM EMPLOYEE: [redacted]

You are hereby advised of your right to appeal this decision as delineated by 306.5 and/or 381.35 of 9 CFR.

12. PLANT MANAGEMENT RESPONSE *(Immediate actions(s))*:
The animal was rendered unconscious before proceeding to the stick area per [redacted]

13. PLANT MANAGEMENT RESPONSE *(further planned actions(s))*:
Specific employees have been assigned to stun Suspect animals in this area & verify the stun. They have also been instructed that if on the 2nd attempt the stun wand is not effective, the captive bolt will be used. per [redacted]

This document serves as written notification that your failure to comply with regulatory requirement(s) could result in additional regulatory or administrative action.

14. SIGNATURE OF PLANT MANAGEMENT: Claudia Snyder — 15. DATE: 9/7/02

16. VERIFICATION [redacted] — 17. DATE: 09/10/02

FSIS FORM 5400-4 ([redacted] FSIS Form 5400-4 (9/97), which may be used until exhausted.(7/56)

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FOOD SAFETY AND INSPECTION SERVICE

NONCOMPLIANCE RECORD CONTINUATION SHEET

TYPE OF NONCOMPLIANCE: ☐ Food Safety ☒ Other Consumer Protection

1. DATE	2. RECORD NO.	3. ESTABLISHMENT NO.
9/5/02	32-2002-2517	00717M M / 1

4. TO (*Name and Title*)	5. PERSONNEL NOTIFIED
Terry Orness, Plant Manager	

6. RELEVANT REGULATION(S)
Directive 6900.1

7. RELEVANT SECTION/PAGE OF ESTABLISHMENT PROCEDURE/PLAN	HACCP	SSOP	OTHER
			N/A

8. ISP CODE	9. NONCOMPLIANCE INDICATOR
04C02	Product Protocol

10. DESCRIPTION OF NONCOMPLIANCE:

addressed the problem of employees not verifying an animal is unconscious before it is hoisted and the fact that their stun wand may be defective with showed me their new captive bolt gun that will be used as a back up if the stun wand fails.

11. SIGNATURE OF INSPECTION PROGRAM EMPLOYEE	15. DATE

FSIS FORM 5400-4 (7/98) Replaces FSIS Form 5400-4 (9/97), which may be used until exhausted (7/98) DISTRIBUTION: Original & 1 copy - Establishment 1 copy - Inspector

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FOOD SAFETY AND INSPECTION SERVICE

NONCOMPLIANCE RECORD

TYPE OF NONCOMPLIANCE: [ ] Food Safety [X] Other Consumer Protection

1. DATE: 7-24-02
2. RECORD NO.: 000509-02
3. ESTABLISHMENT NO.: 00167 M

4. TO (Name and Title): Mr. Jim Sowinski, Plant Manager
4a. PERSONNEL NOTIFIED:

5. RELEVANT REGULATION(S): 313.1(a), 313.2(a)

6. RELEVANT SECTION/PAGE OF ESTABLISHMENT PROCEDURE/PLAN: HACCP | SOP | OTHER: X

6. ISP CODE: 04C02

9. NONCOMPLIANCE CLASSIFICATION INDICATORS

PLANT PROCESS	A. [ ] SSOP	[ ] Monitoring	[ ] Corrective Action	[ ] Recordkeeping	[ ] Implementation	
	B. [ ] HACCP	[ ] Monitoring	[ ] Corrective Action	[ ] Recordkeeping	[ ] Plant Verification	
C. [X] PRODUCT	[ ] Economic	[ ] Misbranding	[X] Protocol			
D. [ ] FACILITY	[ ] Lighting	[ ] Structural	[ ] Outside Premises	[ ] Product Based		
E. [ ] E. COLI	[ ] Other					

10. DESCRIPTION OF NONCOMPLIANCE:
While performing Antemortem inspection at Est 167M at about 0630 hrs, I observed the following humane handling noncompliances:
1) There was no water available for any of the lambs for today's kill
2) The first pen has a broken back gate, which is tied to a post to keep it closed. However, this still poses an injury hazard (Continue

7/24/02
306.5 and/or 381.35 of 9 CFR,

12. PLANT MANAGEMENT RESPONSE: (Immediate action(s))

13. PLANT MANAGEMENT RESPONSE (Further planned action(s)):

This document serves as written notification that your failure to comply with regulatory requirement(s) could result in additional regulatory or administrative action.

14. SIGNATURE OF PLANT MANAGEMENT
15. DATE:

16. VERIFICATION SIGNATURE OF INSPECTION PROGRAM EMPLOYEE
17. DATE:

FSIS FORM 5400-4 (7/98) Replaces FSIS Form 5400-4 (9/97), which may be used until exhausted. **ORIGINAL - Establishment**

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FOOD SAFETY AND INSPECTION SERVICE

NONCOMPLIANCE RECORD CONTINUATION SHEET

TYPE OF NONCOMPLIANCE: [ ] Food Safety [X] Other Consumer Protection

1. DATE	2. RECORD NO.	3. ESTABLISHMENT NO.
7-24-02	00059-02	00167M

4. TO (Name and Title): Mr. Jim Sawinski, Plant Manager

5. PERSONNEL NOTIFIED:

6. RELEVANT REGULATION(S): 313.1(a), 313.2(e)

7. RELEVANT SECTION/PAGE OF ESTABLISHMENT PROCEDURE/PLAN: HACCP [ ] SOP [ ] OTHER [X]

8. ISP CODE: 04C02

9. NONCOMPLIANCE INDICATOR: Protocol

10. DESCRIPTION OF NONCOMPLIANCE:

The ~~pen~~ gate to the stick area was tagged w/ USDA, FSIS reject tag # B19553015 until water was made available to all the lambs. Pen 18/14/12 is tagged w/ Reject tag #'s B19553021, B19553020, B19553001.

Similar NR's include: 00044-02 (4/23/02)

11. SIGNATURE OF INSPECTION PROGRAM EMPLOYEE

12. DATE: 7/24/02

5400-4a (8/87), which may be used until exhausted.

ORIGINAL - Establishment

U.S. DEPARTMENT OF AGRICULTURE
FOOD SAFETY AND INSPECTION SERVICE

NONCOMPLIANCE RECORD

TYPE OF NONCOMPLIANCE: ☐ Food Safety ☒ Other Consumer Protection

1. DATE	2. RECORD NO.	3. ESTABLISHMENT NO.
7/22/02	6-2002-2517	00717M M / 1

4. TO (*Name and Title*): Terry Ornoss, Plant manager

5. PERSONNEL NOTIFIED: [redacted]

6. RELEVANT REGULATION(S): 6900.1 revision 1

7. RELEVANT SECTION/PAGE OF ESTABLISHMENT PROCEDURE/PLAN	HACCP	SSOP	OTHER
			no

8. ISP CODE: 04C02

9. NONCOMPLIANCE CLASSIFICATION INDICATORS

PLANT PROCESS	A. ☐ SSOP	☐ Monitoring	☐ Corrective Action	☐ Recordkeeping	☐ Implementation	
	B. ☐ HACCP	☐ Monitoring	☐ Corrective Action	☐ Recordkeeping	☐ Plant Verification	
C.	☒ PRODUCT	☐ Economic	☐ Misbranding	☒ Protocol		
D.	☐ FACILITY	☐ Lighting	☐ Structural	☐ Outside Premises	☐ Product Based	
E.	☐ E. COLI	☐ Other				

10. DESCRIPTION OF NONCOMPLIANCE:

[redacted] approximately 1237 I observed an animal on the tray at the south end of the shackling table, its front foot was stuck between two pieces of metal at the west end of the tray. An employee who was in the stick area at the time pulled the animal to the floor without first freeing its front foot. This action caused the hind area of the animal to lay on the floor and its front foot still stuck in between the two pieces of metal. The front leg was twisted and the head and shoulders of the animal was off of the floor. I could tell by the way the animal was breathing it had probably started to become conscious again. [redacted] started to hoist the animal up with its rear leg when it started to squeal and thrash

11. SIGNATURE OF INSPECTION: [redacted]

You are hereby advised of your right to [redacted]

12. PLANT MANAGEMENT RESPONSE (*Immediate actions(s)*):
Employee utilized the hoist to remove the hog from where it was hung up. The foot was caught between 2 pieces of angle iron with its body weight hanging down, impeding progress.

13. PLANT MANAGEMENT RESPONSE (*further planned actions(s)*):
Employees counseled and instructed to stun or, use capture bolt gun to render animal insensible prior to shackling or hoisting.

This document serves as written notification that your failure to comply with regulatory requirement(s) could result in additional regulatory or administrative action.

14. SIGNATURE OF PLANT MANAGEMENT: Claudia Snyder — 15. DATE: 7/29/02

16. VERIFICATION SIGNATURE OF INSPECTI[redacted] — 17. DATE: 07-31-02

FSIS FORM 5400-4 (7/98) [redacted] DISTRIBUTION: Original & 1 copy - Establishment, 1 copy - Inspector

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FOOD SAFETY AND INSPECTION SERVICE

NONCOMPLIANCE RECORD CONTINUATION SHEET

TYPE OF NONCOMPLIANCE: ☐ Food Safety ☒ Other Consumer Protection

1. DATE	2. RECORD NO.	3. ESTABLISHMENT NO.
7/22/02	6-2002-2517	00717M M / 1

4. TO (*Name and Title*): Terry Ornoss, Plant manager

5. PERSONNEL NOTIFIED:

6. RELEVANT REGULATION(S): 6900.1 revision 1

7. RELEVANT SECTION/PAGE OF ESTABLISHMENT PROCEDURE/PLAN	HACCP	SSOP	OTHER
			na

8. ISP CODE	9. NONCOMPLIANCE INDICATOR
04C02	Product Protocol

10. DESCRIPTION OF NONCOMPLIANCE:

about. Its leg was removed from the metal. I informed the establishments USDA ante-mortem veterinarian about the incident. talked to several plant employees who work in this area and found out that the employee who initially stunned this animal did not know if it was an effective e stun because the pig lowered its head in the restrainer.

11. SIGNATURE OF INSPECTION PROGRAM EMPLOYEE

15. DATE

FSIS FORM 5400-4 (7/98) — Replaces FSIS Form 5400-4 (9/97), which may be used until exhausted.(7/98) — DISTRIBUTION: Original & 1 copy - Establishment 1 copy - Inspector

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U.S. DEPARTMENT OF AGRICULTURE
FOOD SAFETY AND INSPECTION SERVICE

NONCOMPLIANCE RECORD

TYPE OF NONCOMPLIANCE: [X] Food Safety [ ] Other Consumer Protection

1. DATE	2. RECORD NO.	3. ESTABLISHMENT NO.
7/16/02	00140-02	34J I M/2

4. TO (Name and Title): Darrell Schmidt, Plant Manager

5. PERSON(S) NOTIFIED: [redacted]

6. RELEVANT REGULATION(S): 9CFR 313.30(a)(4), (6)(2)

7. RELEVANT SECTION/PAGE OF ESTABLISHMENT PROCEDURE/PLAN → HACCP | SSOP | OTHER

8. ISP CODE: 04C02

9. NONCOMPLIANCE CLASSIFICATION INDICATORS

PLANT PROCESS	[ ] A. SSOP	[ ] Monitoring	[ ] Corrective Action	[ ] Recordkeeping	[ ] Implementation
	[ ] B. HACCP	[ ] Monitoring	[ ] Corrective Action	[ ] Recordkeeping	[ ] Plant Verification
[X] C. PRODUCT		[ ] Economic	[ ] Misbranding	[X] Protocol	
[ ] D. FACILITY		[ ] Lighting	[ ] Structural	[ ] Outside Premises	[ ] Product Based
[ ] E. E. COLI		[ ] Other			

10. DESCRIPTION OF NONCOMPLIANCE: AT Approximately 20:50, 7/16/02, [redacted] was passing thru The Stunning/Sticking Area and observed Three Stunned hogs between The Shackling Table And The Sticking rail. Two of The Three hogs were in The Process of regaining Consciousness. The first hog woke up during The Attempt To Shackle it. The Second hog was propped up Against The Sticking Tub [redacted] immediately got [redacted]. The Area Supervisor and explained The Situation To him. [redacted] Tried To restun The Second hog but wa

11. SIG [redacted]

You are hereby advised of your right to appeal this decision as delineated by 306.5 and/or 381.35 of 9 CFR.

12. PLANT MANAGEMENT RESPONSE: *(Immediate action(s))*:
~~Maint Team member have been Retrained on proper Procedure of Repairing Stunner probes. No Quick fixes Bring to maint Shop and proper~~
11-7-02 ~~Replace and Restun plugs~~

13. PLANT MANAGEMENT RESPONSE *(Further planned action(s))*:

This document serves as written notification that your failure to comply with regulatory requirement(s) could result in additional regulatory or administrative action.

14. SIGNATURE OF PLANT MANAGEMENT: David Schmidt — 15. DATE: 11/8/02

16. [redacted] INSPECTION PROGRAM EMPLOYEE — 17. DATE: 01/9/13

FSIS [illegible] Designed on FormFlow software.

Replaces FSIS Form 5400-4 (9/97), which may be used until exhausted.

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s.(b)(7)(C)

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FOOD SAFETY AND INSPECTION SERVICE

NONCOMPLIANCE RECORD CONTINUATION SHEET

TYPE OF NONCOMPLIANCE: ☒ Food Safety ☐ Other Consumer Protection

1. DATE	2. RECORD NO.	3. ESTABLISHMENT NO.	
7/16/02	00140.02	244I	1M/2

4. TO (Name and Title): Darrell Schmidt, Plant Manager

5. PERSONNEL NOTIFIED: [redacted]

6. RELEVANT REGULATION(S): 9CFR 313.30(a)(4)(6)(2)

7. RELEVANT SECTION/PAGE OF ESTABLISHMENT PROCEDURE/PLAN ➡	HACCP	SOP	OTHER
			X

8. ISP CODE	9. NONCOMPLIANCE INDICATOR
04C02	

10. DESCRIPTION OF NONCOMPLIANCE:

Unable To get enough electric current To Complete The Stunning. The hog got up And moved Away. IT was later determined That Ther was A defective Connection To The Probes, Causing a decrease or lack of electrical Current. [redacted] Then ordered The Two hogs be Stunned by Shooting Them, This was Successfully carried out.

This Set of circumstances is A violation of Humane Handling And Stunning Technique.

[redacted] was Notified Verbally and in writting with This NR of The Failure To Comply with regulatory requirements

"The Stunned Animal Shall remain in a State of Surgical Anesthesia Through Shackling, Sticking and bleeding."

11. SIGNATURE: [redacted] PVM 7/16/02

12. DATE

FSIS FORM 5400-4a (7/98) Replaces FSIS Form 5400-4a (9/97), which may be used until exhausted. ORIGINAL - Establishment

NONCOMPLIANCE RECORD NUMBER 00140-02

1. **Identify and eliminate the cause of the deviation.**
   The root cause of the deviation was due to a maintenance employee trying to make a "quick fix" on the stunning wands and taping the plug therefore allowing water to get into the wires and causing a short of electrical current in the stunning process. The hogs were humanely and correctly stunned by captive bolt. The stunning wands were removed from the production floor and repaired properly.

2. **Establish measures to prevent reoccurrence.**
   The maintenance man was re-educated on proper repairs to these stunning wands to prevent further reoccurrence. Maintenance will continue to perform preventative maintenance. All barns personnel are trained in animal handling.

3. **Prevent distribution of product adulterated as a result of the deviation.**
   No adulterated product entered commerce due to this deviation.

s.(b)(6) s.(b)(7)(C)

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The request for this information is Voluntary. It is needed to monitor defects found in this inspection system. It is used by FSIS to determine whether establishments are in compliance. 9CFR 301 and 9CFR 381. FORM APPROVED OMB NO. 0583-0089 OMB DISCLOSURE STATEMENT: Public reporting burden for this collection of information is estimated to average 7 minutes per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Department of Agriculture, Clearance Officer, OIRM, Room 404-W, Washington, D.C. 20250; and to the Office of Information and Regulatory Affairs, Office of Management and Budget, Washington, D.C. 20503. If the OMB clearance number does not appear on this form, you are not obligated to complete it.

U.S. DEPARTMENT OF AGRICULTURE
FOOD SAFETY AND INSPECTION SERVICE

NONCOMPLIANCE RECORD

TYPE OF NONCOMPLIANCE: ☐ Food Safety ☐ Other Comsumer Protection

1. DATE	2. RECORD NO.	3. ESTABLISHMENT NO.
7/11/02	00020-02	17496. M/1

4. TO (Name and Title): MR. RON BUNICH

5. [redacted]

6. RELEVANT REGULATION(S): 313.30

7. RELEVANT SECTION/PAGE OF ESTABLISHMENT PROCEDURE/PLAN ➔ | HACCP | SOP | OTHER: X

8. ISP CODE: 04C02

9. NONCOMPLIANCE CLASSIFICATION INDICATORS

PLANT PROCESS	A. ☐ SSOP	☐ Monitoring	☐ Corrective Action	☐ Recordkeeping	☐ Implementation
	B. ☐ HACCP	☐ Monitoring	☐ Corrective Action	☐ Recordkeeping	☐ Plant Verification
C. ☐ PRODUCT		☐ Economic	☐ Misbranding	☐ Protocol	
D. ☐ FACILITY		☐ Lighting	☐ Structural	☐ Outside Premises	☐ Product Based
E. ☐ E. COLI		☐ Other			

10. DESCRIPTION OF NONCOMPLIANCE:
AT 0905 HOURS I WENT TO OBSERVE STUNNING PROCEDURES. I SAW ONE EMPLOYEE WAS STANDING ON THE BACKS OF THE HOGS. TRYIN TO BALANCE [redacted] SELF AND HOIST A HOG, WITH BERNADINO ON A LATTER OVERLOOKING THE AREA AND ASSISTING THE HOISTING PROCEDURE. I COUNTED 12-13 HOGS IN THE STUNNING DOX WITH NO ROOM TO MOVE. I NOTIFIED [redacted] THERE WERE TOO MANY HOGS IN THE STUNNING AREA. THIS IS THE 3RD NR FOR HUMANE HANDLING WRITTEN THIS YEAR. SEE NR 00011-02 & 00004-02

11. [redacted] N PROGRAM EMPLOYEE
SUMO

You are hereby advised of your right to appeal this decision as delineated by 306.5 and/or 381.35 of 9 CFR.

12. PLANT MANAGEMENT RESPONSE: *(Immediate action(s)):*

13. PLANT MANAGEMENT RESPONSE *(further planned action(s)):*

This document serves as written notification that your failure to comply with regulatory requirement(s) could result in additional regulatory or administrative action.

14. SIGNATURE OF PLANT MANAGEMENT	15. DATE
16. VERIFICATION SIGNATURE OF INSPECTION PROGRAM EMPLOYEE	17. DATE

FSIS FORM 5400-4 (7/98) Replaces FSIS Form 5400-4 (9/97), which may be used until exhausted. ORIGINAL - Establishment

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Rod 7-11

U.S. DEPARTMENT OF AGRICULTURE
FOOD SAFETY AND INSPECTION SERVICE

NONCOMPLIANCE RECORD

TYPE OF NONCOMPLIANCE: ☐ Food Safety ☑ Other Consumer Protection

1. DATE	2. RECORD NO.	3. ESTABLISHMENT NO.
07/10/2002	00139-02	00244I M / I

4. TO (Name and Title)	5. PERSONNEL NOTIFIED
Mr. Darrell Schmidt plant manager	kill supervisor

6. RELEVANT REGULATION(S)
313.50 (b)

7. RELEVANT SECTION/PAGE OF ESTABLISHMENT PROCEDURE/PLAN ➡	HACCP	SSOP	OTHER
			X

8. ISP CODE 04C02

9. NONCOMPLIANCE CLASSIFICATION INDICATORS

PLANT PROCESS	☐ SSOP	☐ Monitoring	☐ Corrective Action	☐ Recordkeeping	☐ Implementation
B.	☐ HACCP	☐ Monitoring	☐ Corrective Action	☐ Recordkeeping	☐ Plant Verification
C.	☑ PRODUCT	☐ Economic	☐ Misbranding	☐ Protocol	
D.	☐ FACILITY	☐ Lighting	☐ Structural	☐ Outside Premises	☐ Product Based
E.	☐ E. COLI	☐ Other			

10. DESCRIPTION OF NONCOMPLIANCE:

At approximately 0726 hrs. while performing procedure code 01B02 Inspector observed that two hogs had been placed in the restrainer before the start of production and before pre-operational sanitation could be performed on this randomly selected piece of equipment. The two hogs in question were raising their heads up and trying to move. With live hogs filling the "irons" behind them, they could not move forward or move backward. Inspector choose to bypass this area for pre-op so the two hogs would not be subject to any further discomfort. At approximately 0730 hrs. Inspector requested go ahead and start production. had asked Inspector appximately 15 minutes prior to entering the area in question, if the "stick area" was one of areas to pro-op and Inspector stated that

You are hereby advised of your right to appeal this decision as described by 9CFR under 381.35 of 9 CFR.

12. PLANT MANAGEMENT RESPONSE: *(Immediate action(s))*:

13. PLANT MANAGEMENT RESPONSE *(further planned action(s))*:

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14. SIGNATURE OF PLANT MANAGEMENT	15. DATE
16. VERIFICATION SIGNATURE OF INSPECTION PROGRAM EMPLOYEE	17. DATE

☑ ATTACHMENT

U.S. DEPARTMENT OF AGRICULTURE
FOOD SAFETY AND INSPECTION SERVICE

NONCOMPLIANCE RECORD CONTINUATION SHEET

TYPE OF NONCOMPLIANCE: ☐ Food Safety ☑ Other Consumer Protection

1. DATE	2. RECORD NO.	3. ESTABLISHMENT NO.
07/10/2002	00139-02	00244I M / 1

4. TO (Name and Title)	5. PERSONNEL NOTIFIED
Mr. Darrell Schmidt plant manager	kill supervisor

6. RELEVANT REGULATION(S)
313.50 (b)

7. RELEVANT SECTION/PAGE OF ESTABLISHMENT PROCEDURE/PLAN ➡	HACCP	SOP	OTHER
			X

8. ISP CODE	9. NONCOMPLIANCE INDICATOR
04C02	Product

10. DESCRIPTION OF NONCOMPLIANCE:

the restrainer and shackle table had been randomly selected. Inspector [redacted] notified [redacted] verbally and in writing with this NR and of the failure to comply with regulatory requirements. Previous NR's written for the same inhumane handling deficiency was NR # 072-02 written on 04-11-02. No plant response has yet been received for that NR, however on NR 0148-01 written on 08-27-01 the establishments measure to prevent reoccurence states:"Both shift kill's will start the kills from the circle drive to eliminate any reocurrence."

11. SIGNATURE OF INSPECTION PROGRAM EMPLOYEE	12. DATE
[redacted] 000213	07/10/2002

s.(b)(6)
s.(b)(7)(C)

[redacted] Est. 244I
USDA-FSIS
Logansport, IN

July 23, 2002

RE: Noncompliance Record 00139-02

Dear [redacted]

IBP Establishment 244I, Logansport IN, respectfully requests to appeal NR 00139-02 written for Product.

The basis for this appeal is that the Establishment reviewed this NR and we feel there was not any inhumane treatment or failure to comply with the regulatory requirements of CFR 313.50, which is the tagging of equipment, alleyways, pens, or compartments to prevent inhumane slaughter or handling in connection with slaughter.

Unlike the previous NR's linked in this NR all employees were in place and production was starting. At all times employees trained in animal handling were monitoring the hogs in the restrainer. There was no indication of the hogs being in distress since the hogs in the restrainer were not vocalizing, or having any violent reactions. The hogs were quietly trying to move which is a normal reaction.

In Regards to the statement in this NR referring to NR 0148-02 written on 08-27-02 states, " the establishments measure to prevent reoccurrence states: "Both shift kill's will start the kills from the circle drive to eliminate any reoccurrence." The establishment was

With submittal of this letter, we ask that the noncompliance report be rescinded and that action be reflected in all government records.

Your consideration of this appeal is appreciated. Please provide the establishment with a written response. If you require additional information or would care to discuss, please give me a call at your convenience.

Respectfully,

Darrell Schmidt
AVP Est. 244I

s.(b)(6)
s.(b)(7)(C)

United States Department of Agriculture

Food Safety and Inspection Service

Est. 2441
IBP Inc.
2125 S. Co. Rd. 125 W.
Logansport, IN 46947

Date:

To: Darrell Schmidt
AVP Est. 2441
Logansport, IN 46947

From:
Acting IIC

Subject: Noncompliance Record 00139-02

After reviewing the above mentioned NR, I have no choice but to sustain it as written. It has been determined that maintaining hogs in a restrainer for any longer than is necessary to humanely stun the animal is inhumane handling per 9CFR Part 313.50 (b). All incidences of inhumane stunning or handling must be documented with a Noncompliance Record.

Additional repetitive NRs with the same root cause can result in additional regulatory or administrative action.

000216
DVM

NONCOMPLIANCE RECORD NUMBER 00139-02

1. **Identify and eliminate the cause of the deviation.**
   The root cause of the deviation was due to lack of communication between the hog barns personnel and the kill floor supervisor. The barn team members were not aware of the area had not been released from Pre-op inspection. The hogs were removed from the restrainer.

2. **Establish measures to prevent reoccurrence.**
   The barns team members have been instructed not to begin to put hogs in the restrainer until they have been properly notified by the slaughter floor supervisor that the area has been release from Pre-op inspection.

3. **Prevent distribution of product adulterated as a result of the deviation.**
   No product was affected due to this deviation.

U.S. DEPARTMENT OF AGRICULTURE
FOOD SAFETY AND INSPECTION SERVICE

NONCOMPLIANCE RECORD

TYPE OF NONCOMPLIANCE: ☐ Food Safety ☑ Other Consumer Protection

1. DATE	2. RECORD NO.	3. ESTABLISHMENT NO.
04/30/2002	00053-02	00717 M / 1

4. TO *(Name and Title)*: Terry Ormess plant manager

5. PERSONNEL NOTIFIED:

6. RELEVANT REGULATION(S): 313.2

7. RELEVANT SECTION/PAGE OF ESTABLISHMENT PROCEDURE/PLAN →	HACCP	SSOP	OTHER
			N/A

8. ISP CODE: 04C02

9. NONCOMPLIANCE CLASSIFICATION INDICATORS

PLANT PROCESS	☐ SSOP	☐ Monitoring	☐ Corrective Action	☐ Recordkeeping	☐ Implementation
B.	☐ HACCP	☐ Monitoring	☐ Corrective Action	☐ Recordkeeping	☐ Plant Verification
C. ☑ PRODUCT		☐ Economic	☐ Misbranding	☑ Protocol	
D. ☐ FACILITY		☐ Lighting	☐ Structural	☐ Outside Premises	☐ Product Based
E. ☐ E. COLI		☐ Other			

10. DESCRIPTION OF NONCOMPLIANCE:

During my 0600 ante-mortem inspection I found pens 74, 75, 76, 91, and 92 were overcrowded. There was insufficient room for the hogs to lie down. I discussed this problem during our meeting with plant management on April 26, 2002. I discussed this deficiency with [redacted] IIC and [redacted] Circuit Supervisor.

11. SIGNATURE OF INSPECTION PROGRAM EMPLOYEE: [redacted]

You are hereby advised of your right to appeal this decisio... ...5 of 9 CFR.

12. PLANT MANAGEMENT RESPONSE: *(Immediate action(s))*:

A meeting was held with all Ally Buyers with the contents of over crowding pens. Hogs were removed from the pens listed above to relieve the strain on them.

13. PLANT MANAGEMENT RESPONSE *(Further planned action(s))*:

All pens in the barn will be assigned with the proper amount of hogs to be loaded in each pen. Ally Buyers will be instructed on how many hogs can be load in any pen at one time

This document serves as written notification that your failure to comply with regulatory requirement(s) could result in additional regulatory or administrative action.

14. SIGNATURE OF PLANT MANAGEMENT: [redacted] 15. DATE: 5/8/02

16. VERIFICATION SIGNATURE OF INSPECTION PROGRAM EMPLOYEE: [redacted] 17. DATE: 6/18/02

FSIS FORM 5400-4 (7/... ...which may be used until exhausted.

Designed by FormFlow software.

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U.S. DEPARTMENT OF AGRICULTURE
FOOD SAFETY AND INSPECTION SERVICE

NONCOMPLIANCE RECORD

TYPE OF NONCOMPLIANCE: ☐ Food Safety ☑ Other Consumer Protection

1. DATE	2. RECORD NO.	3. ESTABLISHMENT NO.
04/11/2002	00072-02	00244I M / 2 s.(b)(6) s.(b)(7)(C)

4. TO (Name and Title)	5. PERSONNEL NOTIFIED
Darrell Schmidt, Plant Manager	Slaughter General Supervisor

6. RELEVANT REGULATION(S)
9 CFR 313.30 Part (b) (2)

7. RELEVANT SECTION/PAGE OF ESTABLISHMENT PROCEDURE/PLAN →	HACCP	SSOP	OTHER
			Humane Slaughter

8. ISP CODE 04C02

9. NONCOMPLIANCE CLASSIFICATION INDICATORS

PLANT PROCESS	A. ☐ SSOP	☐ Monitoring	☐ Corrective Action	☐ Recordkeeping	☐ Implementation
	B. ☐ HACCP	☐ Monitoring	☐ Corrective Action	☐ Recordkeeping	☐ Plant Verification
C. ☑ PRODUCT		☐ Economic	☐ Misbranding	☑ Protocol	
D. ☐ FACILITY		☐ Lighting	☐ Structural	☐ Outside Premises	☐ Product Based
E. ☐ E. COLI		☐ Other			

10. DESCRIPTION OF NONCOMPLIANCE:

At approximately 1620 hours on the slaughter floor while performing Ante-mortem inspection and passing through the "stunning area" between end of A shift and B shift startup, [redacted] (B Shift SVMO) observed 3 live pigs in the restrainer. The first two pigs were showing signs of discomfort by head nodding, and struggling to get their footing. The third pig was in the rear of the restrainer and could not physically back out of the restrainer because all the alley's leading to the stunner were also full of pigs. With no A shift IBP personnel employees present [redacted] tagged the restrainer with USDA reject tag # B35945046. [redacted] asked that the A shift floor general [redacted] be summoned to better explain the situation. Upon arrival, [redacted] agreed that the pigs in question were left in the restrainer by A shift personnel. (Page 1of 2)

11. SIGNATURE OF INSP[redacted]'EE
[redacted] DVM

You are hereby advised of your right to appeal this decision as delineated by 306.5 and/or 381.35 of 9 CFR.

12. PLANT MANAGEMENT RESPONSE: *(Immediate action(s)):*

13. PLANT MANAGEMENT RESPONSE *(further planned action(s)):*

This document serves as written notification that your failure to comply with regulatory requirement(s) could result in additional regulatory or administrative action.

14. SIGNATURE OF PLANT MANAGEMENT	15. DATE
16. VERIFICATION SIGNATURE OF INSPECTION PROGRAM EMPLOYEE	17. DATE

FSIS FORM 5400-4 (7/98) Replaces FSIS Form 5400-4 (9/97), which may be used until exhausted. DISTRIBUTION: Original & 1 copy - Establishment; 1 copy - Inspector

Designed on FormFlow software.

s.(b)(6)
s.(b)(7)(C)

ATTACHMENT

U.S. DEPARTMENT OF AGRICULTURE
FOOD SAFETY AND INSPECTION SERVICE

NONCOMPLIANCE RECORD CONTINUATION SHEET

TYPE OF NONCOMPLIANCE: ☐ Food Safety ☑ Other Consumer Protection

1. DATE	2. RECORD NO.	3. ESTABLISHMENT NO.
04/11/2002	00072-02	00244I M / 2

4. TO (Name and Title)	5. PERSONNEL NOTIFIED
Darrell Schmidt, Plant Manager	Slaughter General Supervisor

6. RELEVANT REGULATION(S)
9 CFR 313.30 Part (b) (2)

7. RELEVANT SECTION/PAGE OF ESTABLISHMENT PROCEDURE/PLAN ➡	HACCP	SOP	OTHER
			Humane Slaughter

8. ISP CODE	9. NONCOMPLIANCE INDICATOR
04C02	Product Protocol

10. DESCRIPTION OF NONCOMPLIANCE:

asked to summon kill floor superintendent to the area. Upon arrival, also concurred that pigs had been left in the restrainer and that the situation was not acceptable or to be tolerated. A discussion between and ensued. assured that would take charge of the situation. corrective actions involved making up new signs to be attached to the stunner indicating that no pigs were to be left in the restrainer during any breaks, lunch, or between shifts. agreed to allow to place the new signs. The reject tag was removed by and total downtime resulted in a approximate 35 minute delay in startup of B shift. later confided to that the pigs in question could have been left in the restrainer for up to 35-45 minutes. Only after the frank discussion with , the B shift was allowed to begin to stun animals. This discussion allowed the humane handling situation described in 9 CFR 313.30 (b) (2) to be handled at the plant level without further intervention from higher level FSIS personnel. as well as were informed of the humane handling deficiency both verbally and now in writing of failure to meet 9 CFR Part 313.30 (b) (2). The most recent humane handling issue was NR 148-01 (8-27-01).

11. SIGNATURE OF IN EE	12. DATE
DVM	04/11/2002

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1 copy - Inspector

NONCOMPLIANCE RECORD NUMBER 00072-02

1. **Identify and eliminate the cause of the deviation.**
The deviation occurred due to not having trolleys to hang hogs so the stick pit was shut off until trolleys could be acquired. The stick was intended to start up again before the end of the A shift but a sufficient number of trolleys could not be acquired. Therefore the area supervisor sent the employees home, inadvertently leaving the hogs in the restrainer. Upon notification of the deficiency by the USDA inspector, the A shift kill floor General elected to remove the hogs from the restrainer to avoid any further distress to the animals. As stated in the "Description of Noncompliance", the restrainer was tagged by with USDA reject tag #B35945046 for approximately 35 minutes, preventing this immediate corrective action.

2. **Establish measures to prevent reoccurrence.**
The area supervisor was reeducated on shutting the stick off at the irons and not to leave hogs in the restrainer during a prolonged breakdown. Each occurrence of mechanical breakdown will be individually assessed to determine the ability to remove the hogs from the restrainer. Furthermore, signs will be hung above the restrainer stating that no hogs are to be left in the restrainer during any breaks, lunch or between shifts.

3. **Prevent distribution of product adulterated as a result of the deviation.**
No product was affected due to this deviation.

s.(b)(6)
s.(b)(7)(C)

The request for this information is Voluntary. It is needed to monitor defects found in this inspection system. It is used by FSIS to determine whether establishments are in compliance. 9CFR 301 and 9CFR 381 FORM APPROVED OMB NO. 0583-0089 **OMB DISCLOSURE STATEMENT:** Public reporting burden for this collection of information is estimated to average 7 minutes per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. *Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to* Department of Agriculture, Clearance Officer, OIRM, Room 404-W, Washington, D.C. 20250; and to the Office of Information and Regulatory Affairs, Office of Management and

U.S. DEPARTMENT OF AGRICULTURE
FOOD SAFETY AND INSPECTION SERVICE

NONCOMPLIANCE RECORD

TYPE OF NONCOMPLIANCE: ☐ Food Safety ☑ Other Consumer Protection

1. DATE	2. RECORD NO.	3. ESTABLISHMENT NO.
04/04/2002	00011-02	17496 M / 1

4. *TO (Name and Title)*: Mr. Ron Buncich-Plant President

5. PERSONNEL NOTIFIED: Ron Buncich

6. RELEVANT REGULATION(S): 313.30(a)(4)

7. RELEVANT SECTION/PAGE OF ESTABLISHMENT PROCEDURE/PLAN →	HACCP	SSOP	OTHER
			X

8. ISP CODE: 04C02

9. NONCOMPLIANCE CLASSIFICATION INDICATORS

PLANT PROCESS	☐ SSOP	☐ Monitoring	☐ Corrective Action	☐ Recordkeeping	☐ Implementation
	B. ☐ HACCP	☐ Monitoring	☐ Corrective Action	☐ Recordkeeping	☐ Plant Verification
C. ☑ PRODUCT		☐ Economic	☐ Misbranding	☑ Protocol	
D. ☐ FACILITY		☐ Lighting	☐ Structural	☐ Outside Premises	☐ Product Based
E. ☐ E. COLI		☐ Other			

10. DESCRIPTION OF NONCOMPLIANCE:

At 1015 hours I went to observe the humane slaughter procedure. I observed employees shackle & rise a stunned hog and send it to be bled. The next hog I watched had not been stunned since the preceeding hog had been raised. This 2nd hog was partially raised on its sternum as the shackle was put on. As the hog was raised up by the hoist I observed it appeared to be concious. It was struggling and blinking its eyes. I called out to tell the employees that the hog was not properly stunned but was ignored. I watched as the hog went to be stuck and thrashed enough to come off the shackle and fall into the bleeding area. It was concious and had eye movement as I watched the crew shackle it again, drag it back into the stunning area to raise it up again. Again I tried to stop what was happening, but was ignored again, even by

11. SIGNATURE OF INSPECTION: SVMO SVMO

You are hereby advised of your right to appeal this decision as delineated by 306.5 and/or 381.35 of 9 CFR.

12. PLANT MANAGEMENT RESPONSE: *(Immediate action(s))*:

13. PLANT MANAGEMENT RESPONSE *(further planned action(s))*:

This document serves as written notification that your failure to comply with regulatory requirement(s) could result in additional regulatory or administrative action.

14. SIGNATURE OF PLANT MANAGEMENT	15. DATE
16. VERIFICATION SIGNATURE OF INSPECTION PROGRAM EMPLOYEE	17. DATE

FSIS FORM 5400-4 (7/98) *Designed on FormFlow software.* Replaces FSIS Form 5400-4 (9/97), which may be used until exhausted.

DISTRIBUTION: Original & 1 copy - Establishment
1 copy - Inspector

s.(b)(6)
s.(b)(7)(C)

☑ ATTACHMENT

U.S. DEPARTMENT OF AGRICULTURE
FOOD SAFETY AND INSPECTION SERVICE

NONCOMPLIANCE RECORD CONTINUATION SHEET

TYPE OF NONCOMPLIANCE: ☐ Food Safety ☑ Other Consumer Protection

1. DATE	2. RECORD NO.	3. ESTABLISHMENT NO.
04/04/2002	00011-02	17496 M / 1

4. TO *(Name and Title)*: Mr. Ron Buncich-Plant President

5. PERSONNEL NOTIFIED: Ron Buncich

6. RELEVANT REGULATION(S): 313.30(a)(4)

7. RELEVANT SECTION/PAGE OF ESTABLISHMENT PROCEDURE/PLAN ➡	HACCP	SOP	OTHER
			X

8. ISP CODE	9. NONCOMPLIANCE INDICATOR
04C02	Product Protocol

10. DESCRIPTION OF NONCOMPLIANCE:

who was on a ladder overlooking the stunning area. At this time Foreman came along and I told o stop the stunning as they were not stunning properly. I went and got Mr. Buncich and informed him of the problem. We went back to the stunning area where he questioned his employees, who told him the hog fell after being stuck. I informed him again that the hog was not unconcious when it was being stuck. At this point the stunning was started again to observe the procedure & be sure the equipment was working. The next several hogs were properly stunned one at a time. I stated that I believe that previous to this what I observed appearred to be because the employees were trying to stun more than one hog at a time. Mr. Buncich told both foremen that the stunning procedure was to be stun one hog only, shackle & lift it, to send it to the bleeding area and then to proceed with stunning the next hog. Kill was resumed.
This is a repeat deficiency documented on NR 00004-02 03/06/02. Failure to comply with regulatory requirements could result in further action.

11. SIGNATURE OF INSPECTION	12. DATE
SVMO SVMO	04/04/2002

FSIS FORM 5400-4a (7/98) Replaces FSIS Form 5400-4 (9/97), which may be used until exhausted.

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U.S. DEPARTMENT OF AGRICULTURE
FOOD SAFETY AND INSPECTION SERVICE

NONCOMPLIANCE RECORD

TYPE OF NONCOMPLIANCE: ☐ Food Safety ☑ Other Consumer Protection

1. DATE	2. RECORD NO.	3. ESTABLISHMENT NO.
03/06/2002	00004-02	17496 M / 1

4. TO *(Name and Title)*: Mr. Ron Buncich - Plant President

5. PERSONNEL NOTIFIED: Ron Buncich

6. RELEVANT REGULATION(S): 313.30 (a) (4)

7. RELEVANT SECTION/PAGE OF ESTABLISHMENT PROCEDURE/PLAN ➡	HACCP	SSOP	OTHER
			X

8. ISP CODE: 04C02

9. NONCOMPLIANCE CLASSIFICATION INDICATORS

PLANT PROCESS	☐ A. SSOP	☐ Monitoring	☐ Corrective Action	☐ Recordkeeping	☐ Implementation
	☐ B. HACCP	☐ Monitoring	☐ Corrective Action	☐ Recordkeeping	☐ Plant Verification
☑ C. PRODUCT		☐ Economic	☐ Misbranding	☑ Protocol	
☐ D. FACILITY		☐ Lighting	☐ Structural	☐ Outside Premises	☐ Product Based
☐ E. E. COLI		☐ Other			

10. DESCRIPTION OF NONCOMPLIANCE:

At 0710 hours while performing verification of humane slaughter I observed five hogs being shackled, hung,and stick that were not stunned according to regulations 313.30 that states, " The quality and location of the electrical shock shall be such as to produce immediate insensibility to pain in the exposed animal. The stunned animal shall remain in a state of surgical anesthesia through shackling, sticking, and bleeding." The five hogs that I observed had rapid eye movement and excessive blinking of the eye lids, and what appeared to be voluntary movement of the snout and mouth after being shackled and before being stuck. After hogs were stuck there was still blinking of the eyes during the time of bleed out and also rapid movement (opening and closing) of the mouth. There was also a large amount of movement of the front shoulders and the one leg that

11. SIGNATURE OF INSPECTIO (District office copy)

You are hereby advised of your right to appeal this decision as delineated by 306.5 and/or 381.35 of 9 CFR.

12. PLANT MANAGEMENT RESPONSE: *(Immediate action(s))*:

13. PLANT MANAGEMENT RESPONSE *(further planned action(s))*:

This document serves as written notification that your failure to comply with regulatory requirement(s) could result in additional regulatory or administrative action.

14. SIGNATURE OF PLANT MANAGEMENT	15. DATE
16. VERIFICATION SIGNATURE OF INSPECTION PROGRAM EMPLOYEE	17. DATE

s.(b)(6)
s.(b)(7)(C)

☑ ATTACHMENT

U.S. DEPARTMENT OF AGRICULTURE
FOOD SAFETY AND INSPECTION SERVICE

NONCOMPLIANCE RECORD CONTINUATION SHEET

TYPE OF NONCOMPLIANCE: ☐ Food Safety ☑ Other Consumer Protection

1. DATE	2. RECORD NO.	3. ESTABLISHMENT NO.
03/06/2002	00004-02	17496 M / 1

4. TO *(Name and Title)*	5. PERSONNEL NOTIFIED
Mr. Ron Buncich - Plant President	Ron Buncich

6. RELEVANT REGULATION(S)
313.30 (a) (4)

7. RELEVANT SECTION/PAGE OF ESTABLISHMENT PROCEDURE/PLAN ➧	HACCP	SOP	OTHER
			X

8. ISP CODE	9. NONCOMPLIANCE INDICATOR
04C02	Product Protocol

10. DESCRIPTION OF NONCOMPLIANCE:

was not shackled, that could be contributed to involuntary muscle movements resulting from an electric shock being applied. During the first few minutes of observing the plant's stunning procedure, the employee applying the electric shock held the stunning device on the hogs at the point behind the ears for one second before releasing. Two hogs were being stunned at once, one after the other and then one would be hung and stuck while the second was being hung. There was also six other hogs in the pen in addition to these two causing the stunning area to being full which at times made it difficult for the employee to have enough move in which to shackle and hang the hog in a timely manner. I immediately notified supervisors and and asked the to notify Mr. Ron Buncich. At this time spoke to the employee performing the stunning and the employee started holding the electric shocking device on the hogs for a longer period of time while stunning and hanging one hog before going on to the next. Approximately one hour later while I was working the slaughter line Mr. Buncich was in the area and I did notify him on what had occurred.
Mr. Buncich was notified of his failure to comply with regulatory requirements. This document serves as written notification that your failure to comply with regulatory requirements could result in additional regulatory or administrative action.

11. SIGNATURE OF INSP	12. DATE
	03/06/2002

FSIS FORM 5400-4a (ich may be used until exhausted.

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1 copy - Inspector

s.(b)(6)

s.(b)(7)(C)

The request for this information is Voluntary. It is needed to monitor defects found in this inspection system. It is used by FSIS to determine whether establishments are in compliance. 9CFR 301 and 9CFR 381 FORM APPROVED OMB NO. 0583-0089 **OMB DISCLOSURE STATEMENT:** *Public reporting burden for this collection of information is estimated to average 7 minutes per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to* Department of Agriculture, Clearance Officer, OIRM, Room 404-W, Washington, D.C. 20250; *and to the Office of Information and Regulatory Affairs, Office of Management and*

U.S. DEPARTMENT OF AGRICULTURE
FOOD SAFETY AND INSPECTION SERVICE
NONCOMPLIANCE RECORD

TYPE OF NONCOMPLIANCE: ☐ Food Safety ☑ Other Consumer Protection

1. DATE	2. RECORD NO.	3. ESTABLISHMENT NO.
02/15/2002	00014-02	00085B M / 1

4. TO *(Name and Title)*: Mr. Larry Corbin, Regulatory Superintendent

5. PERSONNEL NOTIFIED:

6. RELEVANT REGULATION(S): 6900.1 (II)(A)(1)(h); 313.2(d)(2); 313.30(a)(1)

7. RELEVANT SECTION/PAGE OF ESTABLISHMENT PROCEDURE/PLAN ➔	HACCP	SSOP	OTHER
			X

8. ISP CODE: 04C02

9. NONCOMPLIANCE CLASSIFICATION INDICATORS

PLANT PROCESS	A. ☐ SSOP	☐ Monitoring	☐ Corrective Action	☐ Recordkeeping	☐ Implementation
	B. ☐ HACCP	☐ Monitoring	☐ Corrective Action	☐ Recordkeeping	☐ Plant Verification
C. ☑ PRODUCT		☐ Economic	☐ Misbranding	☑ Protocol	
D. ☐ FACILITY		☐ Lighting	☐ Structural	☐ Outside Premises	☐ Product Based
E. ☐ E. COLI		☐ Other			

10. DESCRIPTION OF NONCOMPLIANCE:

At approximately 0740 hrs on 2/15/02, while performing ISP 04C02, I witnessed a hog receive an inadequate stun, evidenced by the stun's inability to produce the required surgical plane of anesthesia. Plant employees allowed this hog to pass the shackle table onto the floor. A different plat employee then shackled the conscious hog by the right carpus, hoisted, and drug the pig about five feet. There was no plant supervisor was in the area. Considering the hoist person was a new hire and that his supervisor was not there, the stun area was not tagged nor the kill halted. The supervisor appeared after the incident and was informed of it.
Other NRs concerning humane issues are #00011-02, written on 2/4/02, and #00004-02 written on 1/9/02.

11. SIGNATURE OF INSPECTION PROGF

You are hereby advised of your right to appeal this decision as delineated by 306.5 and/or 381.35 of 9 CFR.

12. PLANT MANAGEMENT RESPONSE: *(Immediate action(s))*:
Food Safety Corrective Action Report (FSCAR #2002-133) has been completed and is the formal response to this Noncompliance Report.

13. PLANT MANAGEMENT RESPONSE *(Further planned action(s))*:

This document serves as written notification that your failure to comply with regulatory requirement(s) could result in additional regulatory or administrative action.

14. SIGNATURE OF PLANT MANAGEMENT	15. DATE
Larry Corbin	3/6/02
16. EMPLOYEE	17. DATE
	3/6/02

FSIS *Designed on FormFlow software.* 4 (9/97), which may be used until exhausted.

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U.S. DEPARTMENT OF AGRICULTURE
FOOD SAFETY AND INSPECTION SERVICE

NONCOMPLIANCE RECORD

TYPE OF NONCOMPLIANCE: [ ] Food Safety [x] Other Consumer Protection

1. DATE	2. RECORD NO.	3. ESTABLISHMENT NO.
02/04/2002	00011-02	00085B M / 1

4. TO *(Name and Title)*: Mr. Larry Corbin, Regulatory Superintendent

5. PERSONNEL NOTIFIED:

6. RELEVANT REGULATION(S): 313.2 (e)

7. RELEVANT SECTION/PAGE OF ESTABLISHMENT PROCEDURE/PLAN ➔ | HACCP | SSOP | OTHER X

8. ISP CODE: 04C02

9. NONCOMPLIANCE CLASSIFICATION INDICATORS

PLANT PROCESS	A. [ ] SSOP	[ ] Monitoring	[ ] Corrective Action	[ ] Recordkeeping	[ ] Implementation
	B. [ ] HACCP	[ ] Monitoring	[ ] Corrective Action	[ ] Recordkeeping	[ ] Plant Verification
C. [x] PRODUCT		[ ] Economic	[ ] Misbranding	[x] Protocol	
D. [ ] FACILITY		[ ] Lighting	[ ] Structural	[ ] Outside Premises	[ ] Product Based
E. [ ] E. COLI		[ ] Other			

10. DESCRIPTION OF NONCOMPLIANCE:

On 02/04/02 at about 0530 am, I discussed the need for water access for pigs in the suspect and downer pens because there was none available at the time. Initial discussion was with [redacted] At about 0600 hours I also discussed this with [redacted] No water, nor empty water containers were available in either of the two USDA Suspect pens nor the downer pen near the stun area at approximately 1445 hours and 1645 hours.

11. SIGNATURE OF INSPECTI [redacted]

You are hereby advised of your right to appeal this decision as delineated by 306.5 and/or 381.35 of 9 CFR.

12. PLANT MANAGEMENT RESPONSE: *(Immediate action(s))*:
Food Safety Corrective action Report (FSCAR # 2002-101) has been completed and is the formal response to this Noncompliance Report.

13. PLANT MANAGEMENT RESPONSE *(Further planned action(s))*:

This document serves as written notification that your failure to comply with regulatory requirement(s) could result in additional regulatory or administrative action.

14. SIGNATURE OF PLANT MANAGEMENT: Larry Corbin | 15. DATE: 3/6/02

16. VERIFICATION/SIGNATURE OF INSPECTION PROGRAM EMPLOYEE: [redacted] | 17. DATE: 3-6-02

FSIS [illegible] (7/98) Replaces FSIS Form 5400-4 (9/97), which may be used until exhausted. DISTRIBUTION: Original & 1 copy - Establishment

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s.(b)(7)(C)

This request for this information is Voluntary. It is needed to prevent defects found in this inspection system. It is used by FSIS to determine whether establishments are in compliance with 9CFR 301 and 9CFR 381. FORM APPROVED OMB NO. 0583-0089. OMB DISCLOSURE STATEMENT: Public reporting burden for the collection of information is estimated to average 7 minutes per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Department of Agriculture, Clearance Officer, OIRM, Room 404-W, Washington, D.C. 20250; and to the Office of Information and Regulatory Affairs, Office of Management and

U.S. DEPARTMENT OF AGRICULTURE
FOOD SAFETY AND INSPECTION SERVICE

NONCOMPLIANCE RECORD

TYPE OF NONCOMPLIANCE: ☐ Food Safety ☐ Other Consumer Protection

1. DATE	2. RECORD NO.	3. ESTABLISHMENT NO.
01/09/2002	04-02 01 ~~00098-40~~	00085B M / 2

4. TO (Name and Title): Mr. Larry Corbin - Regulatory Superintendent

5. PERSONNEL NOTIFIED: [redacted] - Kill Floor Manager

6. RELEVANT REGULATION(S): FSIS Dir 6900.1

7. RELEVANT SECTION/PAGE OF ESTABLISHMENT PROCEDURE/PLAN ➔ | HACCP | SSOP | OTHER

8. ISP CODE: 04C02

9. NONCOMPLIANCE CLASSIFICATION INDICATORS

PLANT PROCESS	A. ☐ SSOP	☐ Monitoring	☐ Corrective Action	☐ Recordkeeping	☐ Implementation
	B. ☐ HACCP	☐ Monitoring	☐ Corrective Action	☐ Recordkeeping	☐ Plant Verification
C. ☐ PRODUCT		☐ Economic	☐ Misbranding	☐ Protocol	
D. ☐ FACILITY		☐ Lighting	☐ Structural	☐ Outside Premises	☐ Product Based
E. ☐ E. COLI		☐ Other			

10. DESCRIPTION OF NONCOMPLIANCE:

At or about 1650, [redacted] was performing ISP task 04C02 by observing the "stunning" area to verify that the establishment was meeting the criteria set forth in 9 CFR part 313 of the regulations to ensure the humane handling and slaughter of livestock and performing the verifications in FSIS Directive 6900.1 Revision 1.

He observed an establishment employee, in the holding pen immediately before the stunner, attempting to drive a non-ambulatory disabled swine by beating it heavily with a livestock "rattler" The employee was using the cane-like "rattler" as a club and severely striking the animal which was unable rise or use it's rear legs.

[redacted] INSPECTIO
DVM DVM

You are hereby advised of your right to appeal this decision as described by 306.5 and/or 381.35 of 9 CFR.

12. PLANT MANAGEMENT RESPONSE: *(Immediate action(s))*:
Food Safety Corrective action Report (FSCAR #2002-19) has been Completed and is the formal response to this Noncompliance Report.

13. PLANT MANAGEMENT RESPONSE *(Further planned action(s))*:

This document serves as written notification that your failure to comply with regulatory requirement(s) could result in additional regulatory or administrative action.

14. SIGNATURE OF PLANT MANAGEMENT	15. DATE
Larry Corbin II	1/17/02
16. VI [redacted] PROGRAM EMPLOYEE	17. DATE 17 JAN 2002

FSIS F [redacted] Form 5400-4 (9/97), which may be used until exhausted.

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[✓] ATTACHMENT

U.S. DEPARTMENT OF AGRICULTURE
FOOD SAFETY AND INSPECTION SERVICE

NONCOMPLIANCE RECORD CONTINUATION SHEET

TYPE OF NONCOMPLIANCE: [ ] Food Safety [ ] Other Consumer Protection

1. DATE	2. RECORD NO.	3. ESTABLISHMENT NO.
01/09/2002	04-020-C ~~00000-40~~	00085B M / 2

4. TO (Name and Title)	5. PERSONNEL NOTIFIED
Mr. Larry Corbin - Regulatory Superintendent	- Kill Floor Manager

6. RELEVANT REGULATION(S)
FSIS Dir 6900.1

7. RELEVANT SECTION/PAGE OF ESTABLISHMENT PROCEDURE/PLAN ➡	HACCP	SOP	OTHER

8. ISP CODE	9. NONCOMPLIANCE INDICATOR

10. DESCRIPTION OF NONCOMPLIANCE:

ordered the employee to stop his actions and suspended stunner operations by direct orders to the stun operator. No establishment supervisor was available in the area so direct interaction was necessary.

Upon returning to the kill floor, notified Kill Floor Manager, of the situation and that stunning would not resume until the establishment had provided satisfactory assurances that the situation had been corrected.

The stunner operation was suspended for about 18 minutes. met with in the USAD/FSIS/FO and indicated that the specific employee involved had been removed from the area and would be disciplined. indicated that an establishment management person would be assigned to oversee the stun/kill are on a continuous basis to assure proper compliance and a written program of corrective and preventative actions would be submitted within 48 hours. Based upon these assurances and subject to intensive monitoring for the remainder of the shift, the stunner operation was restarted. The immediate non-compliance was resolved at the IIC level and corrective and preventative measures in response to this non-compliance report will also be resolved at that establishment level.

However, it should be noted that in accordance with 9 CFR 500.3(b) of the regulations, FSIS may suspend inspection without providing an establishment prior notification because the establishment is handling or slaughtering animals inhumanely. Further violations of this nature may be referred to the District Office for coordination.

11. SIGNATURE OF INSPECTION		12. DATE
DVM	D VM	01/09/2002

FSIS FORM 5400-4a (7/98) Replaces FSIS Form 5400-4 (9/97), which may be used until exhausted. DISTRIBUTION: Original &1 copy - Establishment 1 copy - Inspector

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This request for this information is Voluntary. It is needed to monitor defects found in this inspection system. It is used by FSIS to determine whether establishments are in compliance. 9CFR 301 and 9CFR 381 FORM APPROVED OMB NO. 0583-0089 OMB DISCLOSURE STATEMENT: Public reporting burden for this collection of information is estimated to average 7 minutes per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Department of Agriculture, Clearance Officer, OIRM, Room 404-W, Washington, D.C. 20250; and to the Office of Information and Regulatory Affairs, Office of Management and

U.S. DEPARTMENT OF AGRICULTURE
FOOD SAFETY AND INSPECTION SERVICE
NONCOMPLIANCE RECORD

TYPE OF NONCOMPLIANCE: ☐ Food Safety ☑ Other Consumer Protection

1. DATE	2. RECORD NO.	3. ESTABLISHMENT NO.
12/11/2001	00059-01	00167 M / I

4. TO *(Name and Title)*: Jim Sowinski, Plant Manager

5. PERSONNEL NOTIFIED

6. RELEVANT REGULATION(S): 313.2(d)(1)

7. RELEVANT SECTION/PAGE OF ESTABLISHMENT PROCEDURE/PLAN ➔ | HACCP | SSOP | OTI x

8. ISP CODE: 04C02

9. NONCOMPLIANCE CLASSIFICATION INDICATORS

PLANT PROCESS	A. ☐ SSOP	☐ Monitoring	☐ Corrective Action	☐ Recordkeeping	☐ Implementation
	B. ☐ HACCP	☐ Monitoring	☐ Corrective Action	☐ Recordkeeping	☐ Plant Verification
C. ☑ PRODUCT		☐ Economic	☐ Misbranding	☑ Protocol	
D. ☐ FACILITY		☐ Lighting	☐ Structural	☐ Outside Premises	☐ Product Based
E. ☐ E. COLI		☐ Other			

Att: From 00167 M

10. DESCRIPTION OF NONCOMPLIANCE:

At approximately 0635 this morning, when I went to the barn to complete antemortem inspection on the calves for slaughter today, I noticed that there were 12 calves in the US Suspect pen. Of these 12, only 3 were nonambulatory. According to 9CFR 313.2(d)(1), "disabled animals and other animals unable to move shall be separated from normal ambulatory animals". The 9 ambulatory calves were removed from the pen. One downer was moribund and was destroyed.

11. SIGNATURE OF INSPECTION PROGRAM EMPLOYEE: DVM — DVM

You are hereby advised of your right to appeal this decision as provided by [illegible] CFR.

12. PLANT MANAGEMENT RESPONSE: *(Immediate action(s))*:

CALVES WERE MOVED FROM PEN TO OTHER PEN

13. PLANT MANAGEMENT RESPONSE *(Further planned action(s))*:

TALKED TO THE TRUCKER AND EXPLAINED TO ABOUT PUTTING HEALTHY CALVES IN WITH DOWNERS. ONLY DOWNERS BELONG IN SUSPECT PEN

This document serves as written notification that your failure to comply with regulatory requirement(s) could result in additional regulatory or administrative action.

14. SIGNATURE OF PLANT MANAGEMENT	15. DATE
J Sowinski	12-17-01
16. VERIFICATION SIGNATURE OF INSPECTION PROGRAM EMPLOYEE: DVM	17. DATE: 1/17/02

FSIS F... Designed ...400-4 (9/97), which may be used ...til exhausted.

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Faxed 11/07/01

ATTN:

U.S. DEPARTMENT OF AGRICULTURE
FOOD SAFETY AND INSPECTION SERVICE
NONCOMPLIANCE RECORD

TYPE OF NONCOMPLIANCE: ☐ Food Safety ☐ Other Consumer Protection

1. DATE	2. RECORD NO.	3. ESTABLISHMENT NO.
11/06/2001	00016-01	18229 M / 1

4. TO (Name and Title): Nick Simov

5. PERSONNEL NOTIFIED: Nick Simov

6. RELEVANT REGULATION(S): 313.1(c) and 313.2(d)(1) and 313.2(e)

7. RELEVANT SECTION/PAGE OF ESTABLISHMENT PROCEDURE/PLAN ➔ | HACCP | SSOP | OTHER: Humane Slaughter

8. ISP CODE: 04C02

9. NONCOMPLIANCE CLASSIFICATION INDICATORS

PLANT PROCESS	☐ SSOP	☐ Monitoring	☐ Corrective Action	☐ Recordkeeping	☐ Implementation
	B. ☐ HACCP	☐ Monitoring	☐ Corrective Action	☐ Recordkeeping	☐ Plant Verification
C. ☐ PRODUCT		☐ Economic	☐ Misbranding	☐ Process	
D. ☐ FACILITY		☐ Lighting	☐ Structural	☐ Outside Premises	☐ Product Based
E. ☐ E. COLI		☐ Other			

DESCRIPTION OF NONCOMPLIANCE:

There is no U.S. Suspect pen in the facility. Also there is not access to water in all of the hog pens. The Regulations stated above clearly state that there must be a U.S. Suspect pen to separate any suspect animal and any disabled or "downer" animal unable to move in order to allow the inspection staff to do the Antemortem exam as well as to protect the disabled animals. Regulation 307.2(a) also states that an employee of the Establishment must assist in the separation of the Suspect and disabled animals into the suspect pen. There also must be water available to all of the hogs at all times. Although the plant has one water trough and a hose spraying onto the pen closest to the stunning area, this is not sufficient to satisfy the regulations.

Give Verbal Warning Must be Done by Monday 11/12/01

OF (Name): DVM

You are hereby advised of your right to appeal this decision as delineated by 306.5 and/or 381.35 of 9CFR.

12. PLANT MANAGEMENT RESPONSE: (Immediate actions(s)):
We will construct a US Suspect Pen by November 29/01 with. and Clearly stating U.S. Suspect We will also get a water trouths for each pen

13. PLANT MANAGEMENT RESPONSE (Further planned actions(s)):
Plant Employees will make sure any Disabled "Downer" is in the Suspect Pen and Water troughs are Full before the start of operations

This document serves as written notification that your failure to comply with regulatory requirements(s) could result in additional regulatory or administrative action.

14. SIGNATURE OF PLANT MANAGEMENT: Nick Simov — 15. DATE: 11/7/01

16. EMPLOYEE — 17. DATE: 11/07/01

FSIS Designed on FormFlow 4.0.1

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The request for this information is Voluntary. It is needed to monitor defects found in this inspection system. It is used by FSIS to determine whether establishments are in compliance. 9CFR 301 and 9CFR 381. FORM APPROVED OMB NO. 0583-0089. OMB DISCLOSURE STATEMENT: Public reporting burden for this collection of information is estimated to average 7 minutes per response, including the time for reviewing instructions, searching existing data soures, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, inluding suggestions for reducing this burden, to Department of Agriculture, Clearance Officer, OIRM, Room 404-W, Washington, D.C. 20250; and to the Office of Information and Regulatory Affairs, Office of Management and Budget.

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s.(b)(7)(C)

U.S. DEPARTMENT OF AGRICULTURE
FOOD SAFETY AND INSPECTION SERVICE

NONCOMPLIANCE RECORD

TYPE OF NONCOMPLIANCE: [ ] Food Safety [X] Other Consumer Protecti

1. DATE	2. RECORD NO.	3. ESTABLISHMENT NO.
9/18/02	13-2002-2473	17281 M / 1

4. TO (*Name and Title*): Robert Yoder, Plant Manager

5. PERSONNEL NOTIFIED:

6. RELEVANT REGULATION(S): 313.2

7. RELEVANT SECTION/PAGE OF ESTABLISHMENT PROCEDURE/PLAN	HACCP	SSOP	OTHER
			Sec. e pg.63a

8. ISP CODE: 04C02

9. NONCOMPLIANCE CLASSIFICATION INDICATORS

PLANT PROCESS	A. [ ] SSOP	[ ] Monitoring	[ ] Corrective Action	[ ] Recordkeeping	[ ] Implementation
	B. [ ] HACCP	[ ] Monitoring	[ ] Corrective Action	[ ] Recordkeeping	[ ] Plant Verification
C.	[X] PRODUCT	[ ] Economic	[ ] Misbranding	[X] Protocol	
D.	[ ] FACILITY	[ ] Lighting	[ ] Structural	[ ] Outside Premises	[ ] Product Based
E.	[ ] E. COLI	[ ] Other			

10. DESCRIPTION OF NONCOMPLIANCE:

On this date at approximately 0930, [redacted] was checking the barn for humane issues. A pen containing 3 hogs was found that contained no access or container for water. [redacted] was notified of this violation. The regulations state that animals shall have access to water in all holding pens and if held longer than 24 hours, access to feed. There shall also be sufficient room in the holding pens for animals held overnight to lie down. Corrective actions were made immediately. No further action taken.

11. SIGNATURE OF INSPECTION PROGRAM EMPLOYEE

You are hereby advised of your right to appeal this decision as delineated by 306.5 and/or 381.35 of 9 CFR.

12. PLANT MANAGEMENT RESPONSE (*Immediate actions(s)*):

13. PLANT MANAGEMENT RESPONSE (*further planned actions(s)*):

This document serves as written notification that your failure to comply with regulatory requirement(s) could result in additional regulatory or administrative action.

14. SIGNATURE OF PLANT MANAGEMENT	15. DATE
16. VERIFICATION SIGNATURE OF INSPECTION PROGRAM EMPLOYEE	17. DATE

FSIS FORM 5400-4 (7/98) Replaces *FSIS Form 5400-4 (9/97), which may be used until exhausted.(7/98)* DISTRIBUTION: Original & 1 copy - Establishment 1 copy - Inspector

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US Department of Agriculture
FOOD SAFETY AND INSPECTION SERVICE
NONCOMPLIANCE RECORD

TYPE OF NONCOMPLIANCE
☐ Food Safety ☒ Other Consumer Protection

1. DATE	2. RECORD NO.	3. ESTABLISHMENT NO.
02/12/2004	0057-2004-5471	00085B M / 1

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s.(b)(7)(C)

4. TO (Name and Title)
Larry Corbin, Regulatory Superintendent

5. PERSONNEL NOTIFIED

6. RELEVANT REGULATION(S)
313.5

7. SECTION/PAGE OF EST. PROCEDURE PLAN	HACCP	SSOP	OTHER

8. ISP CODE
04C02

9. NONCOMPLIANCE CLASSIFICATION INDICATORS
PRODUCT - Protocol

10. DESCRIPTION OF NONCOMPLIANCE

At 0615 hrs., while in the VI position, I was performing inspection procedure 04C02 in the stick area and noticed a hog gasping for breath. I immediately went to the animal and checked for eye reflexes. The hog blinked it's eye when I put my hand in front of it. I yelled at the employee watching for signs of reflexes telling the animal was not unconscious. The hog then tried to right itself several times. I then yelled for the line to be stopped. The animal was attempting to get lose by this time, arching it's back, kicking it's legs, and breathing rhythmically. A company employee then came forward and used a captive bolt stunner on the animal. had to forcefully hold the hog's head so he could stun it. then went back to get a reload from Supervisor reloaded and stunned the hog a second time. Between the first and second stun, approximately 6 or 7 seconds, the animal continued to exhibit severe kicking actions. After the second captive bolt stun, I again checked the animals eyes and found no blinking action, although the hog did continue to gasp. The line was restarted at this time and I contacted for further instruction on regulatory action. At approximately 0705, Inspector was instructed by to stop the kill by placing U.S. Rejected tags, numbered B35521287 and B35521290, on each one of the Butinas.For a preventive measure, Production Manager, offered the following: 1) Check the to ensure that they are functioning properly; 2) Add an employeeto monitor bleeding after stick; 3) And to add an employee to monitor the state of consciousness between the stick and the blood pit area. After the preventive measure

11. SIGNATURE OF INSPECTION PROGRAM EMPLOYEE

You are hereby advised of your right to appeal this decision as delineated by 306.5 and/or 381.35 of 9 CFR.

12. PLANT MANAGEMENT RESPONSE (Immediate action(s)):

13. PLANT MANAGEMENT RESPONSE (further planned action(s)):

This document serves as written notification that your failure to comply with regulatory requirement(s) could result in additional regulatory or administrative action.

14. SIGNATURE OF PLANT MANAGEMENT 15. DATE

16. VERIFICATION SIGNATURE OF INSPECTION PROGRAM EMPLOYEE 17. DATE

s.(b)(4)
s.(b)(6)
s.(b)(7)(C)

US Department of Agriculture
FOOD SAFETY AND INSPECTION SERVICE
NONCOMPLIANCE RECORD CONTINUATION SHEET

TYPE OF NONCOMPLIANCE
☐ Food Safety ☒ Other Consumer Protection

1. DATE	2. RECORD NO.	3. ESTABLISHMENT NO.
02/12/2004	0057-2004-5471	00085B M / 1

4. TO (Name and Title)
Larry Corbin, Regulatory Superintendent

5. PERSONNEL NOTIFIED

6. RELEVANT REGULATION(S)
313.5

7. SECTION/PAGE OF EST. PROCEDURE PLAN	HACCP	SSOP	OTHER

8. ISP CODE	9. NONCOMPLIANCE CLASSIFICATION INDICATORS
04C02	PRODUCT - Protocol

10. DESCRIPTION OF NONCOMPLIANCE

was accepted by production was allowed to resume and the retain tags were removed from the at approximately 0725.

11. SIGNATURE OF INSPECTION PROGRAM EMPLOYEE

FSIS FORM 5400-4 (7/98)
Replaces FSIS Form 5400-4 (9/97), which may be used until exhausted (7/98)

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s.(b)(7)(C)

2004

compliance. 9CFR 301 and 9CFR 381. FORM APPROVED OMB NO. 0583-0089. OMB DISCLOSURE STATEMENT: Public reporting burden for this collection of information is estimated to average 7 minutes per response, including the time for reviewing instructions, searching existing data soures, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Department of Agriculture, Clearance Officer, OIRM, Room 404-W, Washington, D.C. 20250; and to the Office of Information and Regulatory Affairs, Office of Management and Budget.

U.S. DEPARTMENT OF AGRICULTURE
FOOD SAFETY AND INSPECTION SERVICE

NONCOMPLIANCE RECORD

TYPE OF NONCOMPLIANCE: [ ] Food Safety [X] Other Consumer Protecti

1. DATE	2. RECORD NO.	3. ESTABLISHMENT NO.
5/20/2004	5-2004-5302	01737 M / 1

4. TO (*Name and Title*): Tom Sullivan, President/GM

5. PERSONNEL NOTIFIED:

6. RELEVANT REGULATION(S): 313.1

7. RELEVANT SECTION/PAGE OF ESTABLISHMENT PROCEDURE/PLAN	HACCP	SSOP	OTHER
			A

8. ISP CODE: 04C02

9. NONCOMPLIANCE CLASSIFICATION INDICATORS

PLANT PROCESS	A. [ ] SSOP	[ ] Monitoring	[ ] Corrective Action	[ ] Recordkeeping	[ ] Implementation
	B. [ ] HACCP	[ ] Monitoring	[ ] Corrective Action	[ ] Recordkeeping	[ ] Plant Verification
C.	[X] PRODUCT	[ ] Economic	[ ] Misbranding	[X] Protocol	
D.	[ ] FACILITY	[ ] Lighting	[ ] Structural	[ ] Outside Premises	[ ] Product Based
E.	[ ] E. COLI	[ ] Other			

10. DESCRIPTION OF NONCOMPLIANCE:

While performing a 04C02 task in the hog barn I observed the following. 1) The bottom board of pen #2 on the west side of this pen has splinters all along the top of it. It needs to be replaced or repaired. 2) The alleyway fencing where the hogs are drove up to the final holding pen is in need of some repair. Some boards have holes and gaps that need repaired or replaced to prevent the smaller animals from getting caught in them or getting hurt. 3) The bottom board of the swinging gate to enter the first pen on the southwest corner of the barn has gaps and needs repaired. I notified [redacted] of these noncompliance's and he told me they will be fixed.

11. SIGNATURE OF INSPECTION PROGRAM EMPLOYEE: [redacted]

You are hereby advised of your right to appeal this decision as delineated by 306.5 and/or 381.35 of 9 CFR.

12. PLANT MANAGEMENT RESPONSE (*Immediate actions(s)*):
Started To work on boards immediately. All boards listed in NR and several more were replaced or repaired.

13. PLANT MANAGEMENT RESPONSE (*further planned actions(s)*):
Have instructed employe in barn. To check both Top and bottom of boards for defects and To correct any defects immediately.

This document serves as written notification that your failure to comply with regulatory requirement(s) could result in additional regulatory or administrative action.

14. SIGNATURE OF PLANT MANAGEMENT: [redacted] 15. DATE 5/25/04

16. [redacted] OGRAM EMPLOYEE 17. DATE 5-25-04

F[redacted] places FSIS Form 5400-4 (9/97), which may be used until exhausted.(7/98)

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1 copy - Inspector

2004

The request for this information is Voluntary. It is needed to monitor defects found in this inspection system. It is used by FSIS to determine whether establishments are in compliance. 9CFR 301 and 9CFR 381. FORM APPROVED OMB NO. 0583-0089. OMB DISCLOSURE STATEMENT: Public reporting burden for this collection of information is estimated to average 7 minutes per response, including the time for reviewing instructions, searching existing data soures, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Department of Agriculture, Clearance Officer, OIRM, Room 404-W, Washington, D.C. 20250; and to the Office of Information and Regulatory Affairs, Office of Management and Budget.

s.(b)(6)

U.S. DEPARTMENT OF AGRICULTURE
FOOD SAFETY AND INSPECTION SERVICE

NONCOMPLIANCE RECORD

TYPE OF NONCOMPLIANCE s.(b)(7)(C)

☐ *Food Safety* ☒ *Other Consumer Protecti*

1. DATE	2. RECORD NO.	3. ESTABLISHMENT NO.
5/27/2004	47-2004-6264	00244I M / 1

4. TO (*Name and Title*): Darrell Schmidt, Plant Manager

5. PERSONNEL NOTIFIED:

6. *RELEVANT REGULATION(S)*: 9 CFR 313.2(f); 313.30(a)(4); 313.30(b)(3)

7. RELEVANT SECTION/PAGE OF ESTABLISHMENT PROCEDURE/PLAN	HACCP	SSOP	OTHER
			XX

8. ISP CODE: 04C02

9. NONCOMPLIANCE CLASSIFICATION INDICATORS

PLANT PROCESS	A. ☐ SSOP	☐ Monitoring	☐ Corrective Action	☐ Recordkeeping	☐ Implementation
	B. ☐ HACCP	☐ Monitoring	☐ Corrective Action	☐ Recordkeeping	☐ Plant Verification
C.	☒ PRODUCT	☐ Economic	☐ Misbranding	☒ Protocol	
D.	☐ FACILITY	☐ Lighting	☐ Structural	☐ Outside Premises	☐ Product Based
E.	☐ E. COLI	☐ Other			

10. DESCRIPTION OF NONCOMPLIANCE:

At approximately 1040 hours while performing the 04C02 procedure, [redacted] witnessed the following:

A hog that had been stunned via the electrical cardiac arrest method and shackled by its hind leg was just coming off the shackle table when the animal began to exhibit a righting reflex,as exhibited by an arching of the head back and extension of the neck. Immediately thereafter, the hog blinked 3 times in quick succession. [redacted] asked that the stunner and bleed chain be shut off and that an employee get the captive bolt gun. In that time, the hog began exhibiting a more vigorous righting reflex. This included side-to-side head movements (i.

11. SIGNATURE OF INSPECTION[redacted]R

You are hereby advised of your right t

12. PLANT MANAGEMENT RESP[redacted]

13. PLANT MANAGEMENT RESPONSE (*further planned actions(s)*):

This document serves as written notification that your failure to comply with regulatory requirement(s) could result in additional regulatory or administrative action.

14. SIGNATURE OF PLANT MANAGEMENT	15. DATE
16. VERIFICATION SIGNATURE OF INSPECTION PROGRAM EMPLOYEE	17. DATE

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s.(b)(6)
s.(b)(7)(C)

U.S. DEPARTMENT OF AGRICULTURE
FOOD SAFETY AND INSPECTION SERVICE

NONCOMPLIANCE RECORD CONTINUATION SHEET

TYPE OF NONCOMPLIANCE: ☐ Food Safety ☒ Other Consumer Protection

1. DATE	2. RECORD NO.	3. ESTABLISHMENT NO.
5/27/2004	47-2004-6264	00244I M / 1

4. TO (*Name and Title*): Darrell Schmidt, Plant Manager

5. PERSONNEL NOTIFIED:

6. RELEVANT REGULATION(S): 9 CFR 313.2(f); 313.30(a)(4); 313.30(b)(3)

7. RELEVANT SECTION/PAGE OF ESTABLISHMENT PROCEDURE/PLAN	HACCP	SSOP	OTHER
			XX

8. ISP CODE	9. NONCOMPLIANCE INDICATOR
04C02	Product Protocol

10. DESCRIPTION OF NONCOMPLIANCE:

e. looking toward each flank). As the handler was trying to place the captive bolt on the hog's forehead, the animal was actively trying to get out of the shackle using coordinated muscle movements. The hog was effectively stunned via captive bolt. initiated a withholding action and rejected the stunner using USDA Reject Tag B35945674.

The operator of the stunner was wearing a light blue hat; this hat color is used by the company to signify a novice/new employee. The employee who severs the carotid arteries and jugular vein (the "sticker") said that at the time just prior to stopping the stunner, he noticed a hog hanging on the rail which he characterized as questionable (that is, thought it may have exhibited signs of consciousness). However, explained that he "lost it among the crowd" of other animals on the rail; he was going to look for it when it got closer to him at the stick station. When Program personnel discussed the situation with Kill Floor Supervisor, explained that employees at all three positions (i.e. stunner, shackler, and sticker) were supposed to check for consciousness in each animal and stop the chain immediately if any animal showed signs of consciousness; said animal would be immediately re-stunned via captive bolt. The sticker was designated as the individual charged with final verification of unconsciousness in hogs hung on the rail. As an immediate corrective action, the establishment removed the novice stun operator and replaced him with a more experienced stunner. They also planned to reassess there humane handling procedures in the stick and stun area. The withholding action lasted approximately 10 minutes.

An animal must be sufficiently stunned so as to provide a state of surgical anesthesia. This state of anesthesia must be maintained throughout shackling, sticking, and bleeding. This incident, therefore, constitutes inhumane handling under the cited regulations and the Humane Methods of Slaughter Act of 1978. The establishment was notified of the noncompliance both verbally and in the writing of this NR.

11. SIGNATURE OF INSPECTI

15. DATE 5/27/04

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compliance. 9CFR 301 and 9CFR 381. FORM APPROVED OMB NO. 0583-0089. OMB DISCLOSURE STATEMENT: Public reporting burden for this collection of information is estimated to average 7 minutes per response, including the time for reviewing instructions, searching existing data soures, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Department of Agriculture, Clearance Officer, OIRM, Room 404-W, Washington, D.C. 20250; and to the Office of Information and Regulatory Affairs, Office of Management and Budget.

2004

U.S. DEPARTMENT OF AGRICULTURE
FOOD SAFETY AND INSPECTION SERVICE

NONCOMPLIANCE RECORD

TYPE OF NONCOMPLIANCE

☐ Food Safety ☒ Other Consumer Protecti

s.(b)(6)
s.(b)(7)(C)

1. DATE	2. RECORD NO.	3. ESTABLISHMENT NO.
6/2/2004	48-2004-6173	00244I M / 1

4. TO (*Name and Title*)	5. PERSONNEL NOTIFIED
Darrell Schmidt, Plant Manager	Darrell Schmidt

6. RELEVANT REGULATION(S)
9 CFR 313

7. RELEVANT SECTION/PAGE OF ESTABLISHMENT PROCEDURE/PLAN	HACCP	SSOP	OTHER
			XX

8. ISP CODE 04C02

9. NONCOMPLIANCE CLASSIFICATION INDICATORS

PLANT PROCESS	A. ☐ SSOP	☐ Monitoring	☐ Corrective Action	☐ Recordkeeping	☐ Implementation
	B. ☐ HACCP	☐ Monitoring	☐ Corrective Action	☐ Recordkeeping	☐ Plant Verification
C.	☒ PRODUCT	☐ Economic	☐ Misbranding	☒ Protocol	
D.	☐ FACILITY	☐ Lighting	☐ Structural	☐ Outside Premises	☐ Product Based
E.	☐ E. COLI	☐ Other			

10. DESCRIPTION OF NONCOMPLIANCE:

At approximately 11:20 hours while performing an 04C02 procedure, [redacted] observed the following noncompliance. As one hog was in the restrainer and in the process of being stunned via cardiac arrest electrical stunning, a second hog came from behind and over the top of the first hog already in the restrainer. Using the back of the stunned hog, the second hog attempted to climb out of the restrainer. The stunner tried to stun the second hog, but was successful only at causing the animal to jump and vocalize when the electric current was applied. This hog then twisted around to its right, climbed up onto the north side of the restrainer, went through

11. SIGNATURE OF INSP [redacted]

You are hereby advised of your right to appeal this decision as delineated by 306.5 and/or 381.35 of 9 C.F.R.

12. PLANT MANAGEMENT RESPONSE *(Immediate actions(s))*:

13. PLANT MANAGEMENT RESPONSE *(further planned actions(s))*:

This document serves as written notification that your failure to comply with regulatory requirement(s) could result in additional regulatory or administrative action.

14. SIGNATURE OF PLANT MANAGEMENT	15. DATE
16. VERIFICATION SIGNATURE OF INSPECTION PROGRAM EMPLOYEE	17. DATE

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s.(b)(7)(C)

U.S. DEPARTMENT OF AGRICULTURE
FOOD SAFETY AND INSPECTION SERVICE

NONCOMPLIANCE RECORD CONTINUATION SHEET

TYPE OF NONCOMPLIANCE
☐ Food Safety ☒ Other Consumer Protection

1. DATE	2. RECORD NO.	3. ESTABLISHMENT NO.
6/2/2004	48-2004-6173	00244I M / 1

4. TO (*Name and Title*)	5. PERSONNEL NOTIFIED
Darrell Schmidt, Plant Manager	Darrell Schmidt

6. RELEVANT REGULATION(S)
9 CFR 313

7. RELEVANT SECTION/PAGE OF ESTABLISHMENT PROCEDURE/PLAN	HACCP	SSOP	OTHER
			XX

8. ISP CODE	9. NONCOMPLIANCE INDICATOR
04C02	Product Protocol

10. DESCRIPTION OF NONCOMPLIANCE:

an opening in the side rails and fell to the floor, a distance of approximately 7 vertical feet. The hog had bleeding skin lacerations but was able to stand on 3 legs; however, when trying to walk, it collapsed to the floor after every second or third step. [redacted] ook a withholding action, per 9 CFR 500.3(b), and halted the stunning of hogs. The restrainer was tagged with USDAReject Tag No. B35945590. Among others, Plant Manager [redacted] and Operations Manager [redacted] were notified verbally and in writing of the violation of the Humane Slaughter Act of 1978 and the Federal Meat Inspection Act (FMIA) 21 U.S.C. 603 (b). Additional violations of the cited Acts may result in suspension without notification.

11. SIGNATURE OF INSPECTION PROGRAM EMPLOYEE	15. DATE
[redacted]	

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US Department of Agriculture
FOOD SAFETY AND INSPECTION SERVICE
NONCOMPLIANCE RECORD

TYPE OF NONCOMPLIANCE: ☐ Food Safety ☒ Other Consumer Protection

s.(b)(4)
s.(b)(6)
s.(b)(7)(C)

1. DATE	2. RECORD NO.	3. ESTABLISHMENT NO.
07/15/2004	0061-2004-6264	00244I M / 2

4. TO (Name and Title): Darrell Schmidt, Plant Manager

5. PERSONNEL NOTIFIED: [redacted] Superintendent

6. RELEVANT REGULATION(S): 9CFR 313.30(a)2

7. SECTION/PAGE OF EST. PROCEDURE PLAN	HACCP	SSOP	OTHER
			XX

8. ISP CODE: 04C02

9. NONCOMPLIANCE CLASSIFICATION INDICATORS: PRODUCT - Protocol

10. DESCRIPTION OF NONCOMPLIANCE

At 1900 hours, I [redacted] observed the following noncompliance. Two hogs were present in the [redacted] The lead hog was actively trying to extricate himself from the restrainer as exhibited by the quick movements of its feet and the fact that it was extending its neck back and forth trying to get out. The hog vocalized once and then rested before trying to get out again. The employees of the stick/stun area were on an approximately 15 minute break during this time and there were no employees inthe area at the time the noncompliance was observed. [redacted] took a regulatory control action as per 9CFR 500.2(a)(4) by rejecting the [redacted] using tag B34620754. [redacted] notified Night Yard Supervisor [redacted] Superintendent [redacted] and Kill General [redacted] of the inhumane handling. The immediate action taken was to back the second hog out of the restrainer and into the irons whereupon the gate separating the irons and restrainer was pushed into its closed position. The company opted to humanely stun the hog in the lead position via cardiac arrest electrical stunning and remove him from the [redacted] this hog was company condemned. On examination of the first hog, pressure marks could be seen over each shoulder; when these marks were viewed from the front of the hog they were in the rough shape of a "V". The root cause was determined to be that the employee responsible for shutting down the [redacted] (i.e. the employee stunning the hogs) had not followed the proper procedure of ensuring that all hogs were out of the restrainer and then closing the irons gate. The employee was counseled by [redacted] on proper

11. SIGNATURE OF INSPECTION PROGRAM EMPLOYEE

[redacted]

You are hereby advised of your right to appeal this decision as delineated by 306.5 and/or 381.35 of 9 CFR.

12. PLANT MANAGEMENT RESPONSE (Immediate action(s)):

13. PLANT MANAGEMENT RESPONSE (further planned action(s)):

This document serves as written notification that your failure to comply with regulatory requirement(s) could result in additional regulatory or administrative action.

14. SIGNATURE OF PLANT MANAGEMENT — 15. DATE

16. VERIFICATION SIGNATURE OF INSPECTION PROGRAM EMPLOYEE — 17. DATE

US Department of Agriculture
FOOD SAFETY AND INSPECTION SERVICE
NONCOMPLIANCE RECORD CONTINUATION SHEET

TYPE OF NONCOMPLIANCE: ☐ Food Safety ☒ Other Consumer Protection

1. DATE	2. RECORD NO.	3. ESTABLISHMENT NO.
07/15/2004	0061-2004-6264	00244I M / 2

4. TO (Name and Title)	5. PERSONNEL NOTIFIED
Darrell Schmidt, Plant Manager	[redacted] Superintendent

6. RELEVANT REGULATION(S)
9CFR 313.30(a)2

7. SECTION/PAGE OF EST. PROCEDURE PLAN	HACCP	SSOP	OTHER
			XX

8. ISP CODE	9. NONCOMPLIANCE CLASSIFICATION INDICATORS
04C02	PRODUCT - Protocol

10. DESCRIPTION OF NONCOMPLIANCE

stick-and-stun shutdown procedures.
As a further planned action, [redacted] explained that the person responsible for initiating the shutdown of the stick-and-stun area (i.e. Supervisor, Superintendent, Trainer, or designee) would now also make sure that all hogs were cleared out of the [redacted] and that the gate between the [redacted] and irons was in its shut (down) position prior to actually shutting off the area for any/all breaks including, but not limited to, company break, lunch, and shift changes.
The [redacted] was released at 1908 hours.
Past Similar NRs - Previous Ineffective Plant Actions: Employee failed to follow humane handling procedures of stick-and-stun area. NR: 47-2004 dated 5/27/2004
Failure to comply with the humane handling requirements could result in additional regulatory/administrative action including, but not limited to, suspension of operations without prior notification.

11. SIGNATURE OF INSPECTION PROGRAM EMPLOYEE

[redacted]

2004

US Department of Agriculture
FOOD SAFETY AND INSPECTION SERVICE
NONCOMPLIANCE RECORD

TYPE OF NONCOMPLIANCE
☐ Food Safety ☒ Other Consumer Protection

s.(b)(6)

1. DATE	2. RECORD NO.	3. ESTABLISHMENT NO.
02/05/2004	0005-2004-6340	02926 M / 1

s.(b)(7)(C)

4. TO (Name and Title)	5. PERSONNEL NOTIFIED
Frank Faso, President/GM	Frank Faso

6. RELEVANT REGULATION(S)
313.2(d)2

7. SECTION/PAGE OF EST. PROCEDURE PLAN	HACCP	SSOP	OTHER

8. ISP CODE	9. NONCOMPLIANCE CLASSIFICATION INDICATORS
04C02	PRODUCT - Protocol

10. DESCRIPTION OF NONCOMPLIANCE

On February 4, 2004, while performing antemortem Inspector [redacted] observed a truck driver repeatedly kicking the hog that was disabled and coming off the truck. [redacted] informed the [redacted] in the pens of the occurrence but [redacted] did not see the driver mishandle the pig. Mr. Faso was informed of the occurrence and he took immediate action with the truck driver and his company.

11. SIGNATURE OF INSPECTION PROGRAM EMPLOYEE

[redacted]

You are hereby advised of your right to appeal this decision as delineated by 306.5 and/or 381.35 of 9 CFR.

12. PLANT MANAGEMENT RESPONSE (Immediate action(s)):

13. PLANT MANAGEMENT RESPONSE (further planned action(s)):

This document serves as written notification that your failure to comply with regulatory requirement(s) could result in additional regulatory or administrative action.

14. SIGNATURE OF PLANT MANAGEMENT 15. DATE

16. VERIFICATION SIGNATURE OF INSPECTION PROGRAM EMPLOYEE 17. DATE

s.(b)(6) s.(b)(7)(C) 2004

The request for this information is voluntary. It is needed to monitor defects found in this inspection system. It is used by FSIS to determine whether establishments are in compliance. 9 CFR 301 and 9 CFR 381. FORM APPROVED OMB No. 0583-0089. OMB DISCLOSURE STATEMENT: Public reporting burden for this collection of information is estimated to average 7 minutes per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Department of Agriculture, Clearance Officer, OIRM, Room 404-W, Washington, DC 20250: and tothe Office of Information and Regulatory Affairs, Office of Management and Budget.

US Department of Agriculture
FOOD SAFETY AND INSPECTION SERVICE
NONCOMPLIANCE RECORD

TYPE OF NONCOMPLIANCE
☐ Food Safety ☒ Other Consumer Protection

1. DATE	2. RECORD NO.	3. ESTABLISHMENT NO.
02/05/2004	0006-2004-6340	02926 M / 1

4. TO (Name and Title)	5. PERSONNEL NOTIFIED
Frank Faso, President/GM	Frank Faso

6. RELEVANT REGULATION(S)

313.2(d)3

7. SECTION/PAGE OF EST. PROCEDURE PLAN	HACCP	SSOP	OTHER

8. ISP CODE	9. NONCOMPLIANCE CLASSIFICATION INDICATORS
04C02	PRODUCT - Protocol

10. DESCRIPTION OF NONCOMPLIANCE

Today while performing antemortem in the pens, I observed several pigs going to the water system and there was no water coming out. I spoke with the [redacted] in the pens about the water and [redacted] informed me that the water was frozen for about an hour. I then spoke with Mr. Faso about the water problem and informed him that all pigs should have access to water throughout the entire day. He spoke with the [redacted] from the pens and had the water fixed immediately.

11. SIGNATURE OF INSPECTION PROGRAM EMPLOYEE

[redacted]

You are hereby advised of your right to appeal this decision as delineated by 306.5 and/or 381.35 of 9 CFR.

12. PLANT MANAGEMENT RESPONSE (Immediate action(s)):

13. PLANT MANAGEMENT RESPONSE (further planned action(s)):

This document serves as written notification that your failure to comply with regulatory requirement(s) could result in additional regulatory or administrative action.

14. SIGNATURE OF PLANT MANAGEMENT 15. DATE

16. VERIFICATION SIGNATURE OF INSPECTION PROGRAM EMPLOYEE 17. DATE

2004

US Department of Agriculture
FOOD SAFETY AND INSPECTION SERVICE
NONCOMPLIANCE RECORD

TYPE OF NONCOMPLIANCE
☐ Food Safety ☒ Other Consumer Protection

1. DATE	2. RECORD NO.	3. ESTABLISHMENT NO.
07/20/2004	0066-2004-6264	00244I M / 2 s.(b)(4)

4. TO (Name and Title)
Darrell Schmidt, Plant Manager

5. PERSONNEL NOTIFIED s.(b)(6)
Superintendent s.(b)(7)(C)

6. RELEVANT REGULATION(S)
9 CFR 313.15(a), 313.15(b)(1)(iv), 313.50(b)

7. SECTION/PAGE OF EST. PROCEDURE PLAN	HACCP	SSOP	OTHER
			XX

8. ISP CODE
04C02

9. NONCOMPLIANCE CLASSIFICATION INDICATORS
PRODUCT - Protocol

10. DESCRIPTION OF NONCOMPLIANCE

At approximately 2100 hours, while performing the truck unloading portion of the 04C02 procedure (HAT category II) witnessed the following noncompliance. In the west side of the 6th unloading pen, there were three downer hogs. Two were obviously dead, however, the third hog was rhythmically breathing. When went closer to examine this hog, she saw that the hog had a captive bolt penetration mark on the center of its forehead. The hog had a palpebral (eye) reflex and was rhythmically breathing. When asked, an animal handler working in the same unloading pen identified as the one who stunned this hog; did not see anywhere in the unloading area. immediately got Superintendent , to bring a member of the stick-and-stun area for the purpose of re-stunning the hog. When this individual tried to position the animal's head for the correct captive bolt stunning trajectory, the hog vocalized briefly then was quickly stunned. verified that the animal was dead using the signs of consciousness, including a complete absence of the corneal reflex. The hog was taken to rendering.

Given the egregious nature of the inhumane handling and per 9 CFR 500.3(b), suspended operations at 2108 hours without prior notification; the main drive alley was rejected using USDA tag B34620759. verbally informed , Night Yard Supervisor and Kill General of the violation of the humane handling requirements.

11. SIGNATURE OF INSPECTION PROGRAM EMPLOYEE

You are hereby advised of your right to appeal this decision as delineated by 306.5 and/or 381.35 of 9 CFR.

12. PLANT MANAGEMENT RESPONSE (Immediate action(s)):

13. PLANT MANAGEMENT RESPONSE (further planned action(s)):

This document serves as written notification that your failure to comply with regulatory requirement(s) could result in additional regulatory or administrative action.

14. SIGNATURE OF PLANT MANAGEMENT 15. DATE

16. VERIFICATION SIGNATURE OF INSPECTION PROGRAM EMPLOYEE 17. DATE

s.(b)(4)

s.(b)(6)

US Department of Agriculture
FOOD SAFETY AND INSPECTION SERVICE
NONCOMPLIANCE RECORD CONTINUATION SHEET

TYPE OF NONCOMPLIANCE s.(b)(7)(C)
☐ Food Safety ☒ Other Consumer Protection

1. DATE	2. RECORD NO.	3. ESTABLISHMENT NO.
07/20/2004	0066-2004-6264	00244I M / 2

4. TO (Name and Title)	5. PERSONNEL NOTIFIED
Darrell Schmidt, Plant Manager	Superintendent

6. RELEVANT REGULATION(S)

9 CFR 313.15(a), 313.15(b)(1)(iv), 313.50(b)

7. SECTION/PAGE OF EST. PROCEDURE PLAN	HACCP	SSOP	OTHER
			XX

8. ISP CODE	9. NONCOMPLIANCE CLASSIFICATION INDICATORS
04C02	PRODUCT - Protocol

10. DESCRIPTION OF NONCOMPLIANCE

During the suspension action, plant management met with [redacted] *to discuss measures to bring* the establishment back into compliance. The members of the establishment management present at the meeting were Plant Manager [redacted] Superintendents [redacted] and [redacted] and [redacted] among others. The actions proposed were to:

1) immediately suspend the responsible employee
2) require that only the day and night shift yard supervisors or the yard managers be allowed to captive bolt hogs until training measures could be reassessed, modified as needed, and re-training completed
3) reassess current training materials; to be completed by the end of the week (7/23/2004)
4) retrain team members using the updated training materials and a [redacted]

In addition to these actions, the captive bolt gun (ID#21764) was pulled out of service, will be sent to maintenance for examination, and repaired if necessary.

[redacted] terminated the suspension action at approximately 2300 hours and allowed slaughter operations to resume.

A similar NR (#47-2004-6264) was written on 5/27/2004; the root cause was ineffective stunning. The measures put in place were insufficient in their scope as to prevent recurrence.

11. SIGNATURE OF INSPECTION PROGRAM EMPLOYEE

[redacted]

Fax

s.(b)(6)
s.(b)(7)(C)

Company:	USDA, FSIS, FO	**From:**	
Attn:		**Office location:**	EST 244I, Logansport, IN
Office:	DO, Lombard, IL	**Date:**	9/16/04
Fax:	630-620-7599	**Phone Number:**	574-722

☐ **Urgent** ☑ **For Review** ☐ **Please Comment** ☐ **Please Reply** ☐ **Please Recycle**

• **Total pages, including cover:** 2 **Plant responsed to NR 66-2004**

Enclosed is the plant response to NR 66-2004. The plant made an appeal to me on or about 9-1-04 to have the linkage removed; I denied that appeal. You will notice that the plant still has language in the response disputing the root cause/linking of the NR. I have asked management if they are, in fact, still appealing the link. They are not, but they do not wish to remove the "dispute" from the NR. That, of course, is their choice. I have been able to verify all parts of the corrective and preventive measures outlined both in the NR and the written plant response. Therefore, I have closed this NR. I just wanted you to be aware of the circumstances surrounding the NR response. Otherwise, the response, as written, might cause some confusion.

Thanks,

1) **Identify and eliminate the cause of the deviation or deficiency.**
The available HACCP team member's reassessment of the current training materials for captive bolt procedures concluded that the root cause was an execution failure on part of the responsible team member in that, the team member responsible did not verify that the animal was insensible prior to leaving the area. Upon notification of plant personnel the animal was rendered insensible utilizing a different captive bolt gun and the animal was rendered inedible. The captive bolt gun initially used was taken out of service for the maintenance department to verify that it is properly operating. The captive bolt gun was verified by maintenance and was found to be properly working.

2) **Establish measures to prevent reoccurrence.**
The team member responsible was suspended from employment, re-trained and signed off prior to using the captive bolt. The establishment decided that until the was completed that only the management personnel will be allowed to captive bolt an animal. The establishment completed a reassessment of the captive bolt procedures and determined that the procedure needed amended, therefore was re-written and presented to the USDA office for approval by 7-23-04 as stated in this Non compliance record. The updated training procedures will include to assure understanding in order to ensure that the training was performed correctly. The re-training of team members was initiated on 7-26-04 and will be a continued until all affected team members are trained. Periodic training will continue to assure understanding and to emphasize importance.

3) **Prevent distribution of product adulterated as a result of the deficiency.**
No product was affected due to this deficiency.

The inspector whom initiated this NR states "A similar NR (#47-2004-6264) was written on 5/27/2004; the root cause was ineffective stunning. The measures put in place were insufficient in their scope as to prevent recurrence." The linking of NR 66-2004-6264 to NR 47-2004-6264 dated 5-27-2004 is not accurate in that the preventative measures in NR 47-2004-6264 were effective for the NR deficiency listed in NR 47-2004-6264. The preventative measures stated in NR 47-2004-6264 states, "The new team member responsible was verbally counseled on proper procedures and continued to receive training for the position off line, prior to returning to the on line position to prevent reoccurrence. The team members in all three positions (i.e. stunner, shackler, and sticker) were verbally counseled on proper procedures, and instructed that if a hog is conscious the carcass will be re-stunned via captive bolt. The responsible team members received re-training on humane handling procedures." The establishment contends that the team member responsible for the improper stunning in NR 47-2004-2-6264 were not in any way involved in the execution failure of failing to verify that an animal was insensible prior to leaving the area as stated above for NR 66-2004-6264 therefore the preventative measures were effective as stated in NR 47-2004-6264.

s.(b)(6)
s.(b)(7)(C)

U.S. DEPARTMENT OF AGRICULTURE
FOOD SAFETY AND INSPECTION SERVICE

NONCOMPLIANCE RECORD

TYPE OF NONCOMPLIANCE: ☐ Food Safety ☒ Other Consumer Protecti

1. DATE	2. RECORD NO.	3. ESTABLISHMENT NO.
7/22/2004	24-2004-5290	17564 M / 1

4. TO (*Name and Title*)	5. PERSONNEL NOTIFIED
Gary Jacobson, President/GM	Kill Superintendent,

6. RELEVANT REGULATION(S)
9 CFR 313.30 (a), 500.2 (a) (4), Directive 6900.2

7. RELEVANT SECTION/PAGE OF ESTABLISHMENT PROCEDURE/PLAN	HACCP	SSOP	OTHER
			N/A

8. ISP CODE: 04C02

9. NONCOMPLIANCE CLASSIFICATION INDICATORS

PLANT PROCESS	A. ☐ SSOP	☐ Monitoring	☐ Corrective Action	☐ Recordkeeping	☐ Implementation
	B. ☐ HACCP	☐ Monitoring	☐ Corrective Action	☐ Recordkeeping	☐ Plant Verification
C.	☒ PRODUCT	☐ Economic	☐ Misbranding	☒ Protocol	
D.	☐ FACILITY	☐ Lighting	☐ Structural	☐ Outside Premises	☐ Product Based
E.	☐ E. COLI	☐ Other			

10. DESCRIPTION OF NONCOMPLIANCE:

At approximately 0844 hrs. while in the slaughter, stun, and stick area performing task code 04C02 (Humane handling and Slaughter). CSI observed on the Hog bleed chain a hog kicking, arching its back, and trying to lift its head. Also CSI observed the next hog on the bleed chain kicking its legs, eyes blinking, and still having rhythmic breathing. CSI immediately stopped stunning operations and had Est. personnel re-stun both hogs and CSI applied *Reject/Retaintag #B34787686 to the electrical stunner.* CSI informed Supervisor that stunning operations would not resume until corrective changes

11. SIGNATURE OF INSPECTION PROGRAM EMPLOYEE

You are hereby advised of your right to appeal this decision as delineated by 500.5 and/or 381.35 of 9 CFR.

12. PLANT MANAGEMENT RESPONSE *(Immediate actions(s))*:

13. PLANT MANAGEMENT RESPONSE *(further planned actions(s))*:

This document serves as written notification that your failure to comply with regulatory requirement(s) could result in additional regulatory or administrative action.

14. SIGNATURE OF PLANT MANAGEMENT	15. DATE
16. VERIFICATION SIGNATURE OF INSPECTION PROGRAM EMPLOYEE	17. DATE

FSIS FORM 5400-4 (7/98) Replaces FSIS Form 5400-4 (9/97), which may be used until exhausted.(7/98) DISTRIBUTION: Original & 1 copy - Establishment 1 copy - Inspector

s.(b)(6)
s.(b)(7)(C)

The request for this information is voluntary. It is needed to monitor defects found in this inspection system. It is used by FSIS to determine whether establishments are in compliance. 9 CFR 301 and 9 CFR 381. FORM APPROVED OMB No. 0583-0089. OMB DISCLOSURE STATEMENT: Public reporting burden for this collection of information is estimated to average 7 minutes per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Department of Agriculture, Clearance Officer, OIRM, Room 404-W, Washington, DC 20250; and to the Office of Information and Regulatory Affairs, Office of Management and Budget.

US Department of Agriculture
FOOD SAFETY AND INSPECTION SERVICE
NONCOMPLIANCE RECORD

TYPE OF NONCOMPLIANCE
☐ Food Safety ☒ Other Consumer Protection

1. DATE	2. RECORD NO.	3. ESTABLISHMENT NO.
02/16/2006	0014-2006-9114	32111 M / I

4. TO (Name and Title)
Gary Ruse, Plant Manager

5. PERSONNEL NOTIFIED

6. RELEVANT REGULATION(S)
313.2

7. SECTION/PAGE OF EST. PROCEDURE PLAN	HACCP	SSOP	OTHER
			Humane Handling SOP

8. ISP CODE	9. NONCOMPLIANCE CLASSIFICATION INDICATORS
04C02	PRODUCT - Protocol

10. DESCRIPTION OF NONCOMPLIANCE

At approximately 0600 on 02/16/2006 I observed a Category III humane handling noncompliance. While performing antemortem inspection duties I examined the water tanks to verify that water was available to livestock at all times. Pens # C1 and C2, which share an automated water tank, did not contain any water. There were approximately 75 lambs per pen. I took a regulatory control action by tagging pens C1 and C2 with US Reject Tag # B37819219 and B37819220. The lambs were immediately moved to a different pen and water was provided to them in portable water tanks. The establishment failed to meet the regulatory requirements of 9 CFR 313.2(e) which states that animals shall have access to water in all holding pens.

This document serves as written notification that your failure to comply with regulatory requirement(s) could result in additional regulatory or administrative action.

11. SIGNATURE OF INSPECTION PROGRAM EMPLOYEE

12. PLANT MANAGEMENT RESPONSE (Immediate action(s)):

13. PLANT MANAGEMENT RESPONSE (further planned action(s)):

This document serves as written notification that your failure to comply with regulatory requirement(s) could result in additional regulatory or administrative action.

14. SIGNATURE OF PLANT MANAGEMENT

15. DATE

17. DATE 3/6/06

Replaces FSIS Form 5400-4 (9/97), which may be used until exhausted (7/98)

DISTRIBUTION: Original & 1 Copy to Establishment, 1 Copy to Inspector

U.S. DEPARTMENT OF AGRICULTURE
FOOD SAFETY AND INSPECTION SERVICE

NONCOMPLIANCE RECORD CONTINUATION SHEET

TYPE OF NONCOMPLIANCE
[ ] Food Safety [X] Other Consumer Protection

1. DATE	2. RECORD NO.	3. ESTABLISHMENT NO
6/19/2003	103-2003-4303	00360 M / 1

4. TO (Name and Title)	5. PERSONNEL NOTIFIED
[redacted] (b)(6)	[redacted] (b)(6)

6. RELEVANT REGULATION(S)
313.30(a)(4)

7. RELEVANT SECTION/PAGE OF ESTABLISHMENT PROCEDURE/PLAN	HACCP	SSOP	OTHER
			Slaughter Plan

8. ISP CODE	9. NONCOMPLIANCE INDICATOR
04C02	Product Protocol

10. DESCRIPTION OF NONCOMPLIANCE:

trying to stun the hog was trying to communicate to the person doing the shackling (directly across from him on the other side of the table) to stop the table, the employee shackling did not. I observed the employee with the captive bolt attempted to stun the hog the first time but the captive bolt failed. As the employee tried to recock the captive bolt the employee on the other side of the table (shackling) Placed the shackle on the hogs hind leg. As the hogs hind quarters were being lifted from the bleed table (approx. 4 to 5 inches) the employee with the captive bolt had recock and finally re-stuned the hog. At no time was the bleed table or the shackle line stopped. by a Cloughter employee. At the time of the observation I took regulatory control and tagged the stunning box with tag #B8225821. At this time I asked that [redacted] b(2) acting IIC and [redacted] b(2) be called.

9CFR CH III (1-1-01 Edition) 313.30(a)(4) states the stunned animal shall remain in a state of surgical anesthesia through shackling, sticking and bleeding. Cloughter Pkg. Co. failed to comply with this regulation.

11. SIGNATURE OF INSPECTION PROGRAM EMPLOYEE	15. DATE
[redacted] (b)(6) b(7)(C)	

FSIS FORM 5400-4 (7/98) — Replaces FSIS Form 5400-4 (9/97), which may be used until exhausted (7/98) — DISTRIBUTION: Original & 1 copy - Establishment, 1 copy - Inspector

[redacted]

U.S. DEPARTMENT OF AGRICULTURE
FOOD SAFETY AND INSPECTION SERVICE

NONCOMPLIANCE RECORD

TYPE OF NONCOMPLIANCE: ☐ Food Safety ☒ Other Consumer Protecti

1. DATE	2. RECORD NO.	3. ESTABLISHMENT NO.
3/5/2003	57-2003-4303	00360 M / 1

4. TO (Name and Title): [redacted] (b)(6)

5. PERSONNEL NOTIFIED: [redacted] (b)(6)

6. RELEVANT REGULATION(S): 313.1(a)

7. RELEVANT SECTION/PAGE OF ESTABLISHMENT PROCEDURE/PLAN	HACCP	SSOP	OTHER
			Slaughter Plan

8. ISP CODE: 04C02

9. NONCOMPLIANCE CLASSIFICATION INDICATORS

PLANT PROCESS	A. ☐ SSOP	☐ Monitoring	☐ Corrective Action	☐ Recordkeeping	☐ Implementation
	B. ☐ HACCP	☐ Monitoring	☐ Corrective Action	☐ Recordkeeping	☐ Plant Verification
C.	☒ PRODUCT	☐ Economic	☐ Misbranding	☒ Protocol	
D.	☐ FACILITY	☐ Lighting	☐ Structural	☐ Outside Premises	☐ Product Based
E.	☐ E. COLI	☐ Other			

10. DESCRIPTION OF NONCOMPLIANCE:

While performing anti-mortem at approx. 1050 in the hog pens, I observed the following defects. I walked into pen #4 and observed 2 pieces of the grating over the drain were broken. One hole was approx. 12"x 8" and the other was approx. 36"x 9". The 12"x8" hole had several jagged edges. These edges could cut a hogs foot or break a leg. At the time this defect was observed I contacted [redacted] b(6) I explained the situation and he agreed that this was a inhumane condition. At this time [redacted] b(6) was notified. The pen was tagged and [redacted] b(6) moved the hog to another pen.

11. SIGNATURE OF INSPECTION PROGRAM EMPLOYEE: [redacted] (b)(6) b(7)(C)

You are hereby advised of your right to appeal this decision as delineated by 306.5 and/or 381.35 of 9 CFR.

12. PLANT MANAGEMENT RESPONSE *(Immediate action(s))*:

RECEIVED
MAR 0 5 2003

13. PLANT MANAGEMENT RESPONSE *(further planned actions(s))*:

CLOUGHERTY PACKING CO.
QUALITY ASSURANCE DEPT.
BY [redacted]

This document serves as written notification that your failure to comply with regulatory requirement(s) could result in additional regulatory or administrative action.

14. SIGNATURE OF PLANT MANAGEMENT	15. DATE

16. VERIFICATION SIGNATURE OF INSPECTION PROGRAM EMPLOYEE	17. DATE
[redacted] (b)(6) b(7)(C)	3/17/03

FSIS FORM 5400-4 (7/98) Replaces FSIS Form 5400-4 (9/97), which may be used until exhausted. (7/98) DISTRIBUTION: Original & 1 copy - Establishment 1 copy - Inspector

COMPANY RESPONSE
NON-COMPLIANCE RECORD

DATE: 03/13/03

NR NUMBER: 57-03

RELEVANT REGULATION(S): 313.1(a)

DESCRIPTION OF NONCOMPLIANCE: Please refer to the NR

IMMEDIATE ACTION:
The hogs in the hog pen # 4 were immediately moved to another hog pen and no injuries were observed in any hog in the hog pen # 4. Depth is only 4". It is very unlikely to cause injury.

FURTHER PLANNED ACTION:
1. The piece of grating that was broken was immediately replaced. In addition, a work request was submitted to replace all damaged gratings in the livestock yard.
2. A Quality Assurance technician has been designated to inspect the hog pen on a monthly basis to assure they are maintained in good repair. Any deficiency found would be immediately addressed and corrected.

(b)(6)

SIGNATURE:

DATE: 3-13-03

NR 57-03

US Department of Agriculture
FOOD SAFETY AND INSPECTION SERVICE
NONCOMPLIANCE RECORD

TYPE OF NONCOMPLIANCE: ☐ Food Safety ☒ Other Consumer

1. DATE	2. RECORD NO.	3. ESTABLISHMENT NO.
07/25/2006	0071-2006-4256	00360 M / I

4. TO (Name and Title): Loeci Moreno, Q.A. Manager- North side

5. PERSONNEL NOTIFIED: Loeci Moreno (QA Manager) (b) (6)

6. RELEVANT REGULATION(S): 313.1

7. SECTION/PAGE OF EST. PROCEDURE PLAN	HACCP	SSOP	OTHER
			Humane H

8. ISP CODE	9. NONCOMPLIANCE CLASSIFICATION INDICATORS
04C02	PRODUCT - Protocol

10. DESCRIPTION OF NONCOMPLIANCE

HAT Category-
II Truck Unloading

As I was performing a 04C02 procedure, (HAT category II Truck unloading) at approx. 0630 hrs, the following Humane Handling non-compliance was observed. While at the off loading chute I observed a truck driver unloading bottom level of a two layer truck. After this driver finished unloading the bottom level of this truck, he proceeded the unloading shut to the second level. Once this drive had the chute in position he wanted, he raised the roll up the way to the top. After opening the door the driver saw that the truck was to far forward. This driver was still top of the chute so he asked an another driver from the same trucking company to back his truck up. As the driver truck stood at the top of the chute to keep the hog from coming out of the door the second driver started the truck truck was started one of the hogs came out of the truck and wedged between the truck and the chute. The chute truck were in contact with the hog at approx. the rib area with the back half of the hog hanging below the chute truck. The driver in the truck started to back up squeezing the hog between these two areas. The hog started to squeeling in distress. At this time the driver in the truck pulled forward releasing the hog. When the hog was r

11. SIGNATURE (b) (6) (b) (6)

You are hereby advise[d] ... 5 and/or 381.35 of 9 CFR.

12. PLANT MANAGEMENT RESPONSE (Immediate action(s)):

RECEIV[ED]

13. PLANT MANAGEMENT RESPONSE (further planned action(s)):

(b) (6)

This document serves as written notification that your failure to comply with regulatory requirement(s) could result in add[itional]

14. SIGNATURE OF PLANT MANAGEMENT 15. DATE

16. VERIFICATION SIGNATURE OF INSPECTION PROGRAM EMPLOYEE 17. DATE

FSIS FORM 5400-4 (7/98)
Replaces FSIS Form 5400-4 (9/97), which may be used until exhausted (7/98)

DISTRIBUTION: Original & 1 Copy to Establishment.
Page 1 of 2

US Department of Agriculture
FOOD SAFETY AND INSPECTION SERVICE
NONCOMPLIANCE RECORD CONTINUATION SHEET

TYPE OF NONCOMPLIANCE
Food Safety X Other Consumer Protection

1. DATE	2. RECORD NO.	3. ESTABLISHMENT NO.
09/07/2006	0088-2006-4256	00360 M / 1

4. TO (Name and Title)
Kevin Mead, Director of Quality Assurance

s.(b)(6)
s.(b)(7)(C)

5. PERSONNEL NOTIFIED
(b) (6) (Hog pen Supervisor) Kevin Mead (Dir

6. RELEVANT REGULATION(S)
313.1

7. SECTION/PAGE OF EST. PROCEDURE PLAN	HACCP	SSOP	OTHER
			HAT II (Humane Handl

8. ISP CODE	9. NONCOMPLIANCE CLASSIFICATION INDICATORS
04C02	PRODUCT - Protocol

10. DESCRIPTION OF NONCOMPLIANCE

fall out of the trailer (approx. 4 to 4-1/2 feet) onto its back on the ground below. At this time regulatory control was taken on tag# B8225531 and (b) (6) (Hog Pen Supervisor) was called. When (b) (6) arrived I (Insp. (b) (6) explained the situation and advised (b) (6) that a non-compliance under ISP code 04C02 (Humane Handling) would be issued.

Driving animals off semi-trailers over a drop off without providing adequate unloading facilities has been identified as an egregious act.

A similar non-compliance with the same cause was issued on 7/25/2006 on NR# 71-2006; an acceptable long term corrective action has not been received by agency personnel as of this date.

This matter was referred to the Alameda District Office at which time per (CFR500.3(b) a withholding action was initiated.

This document serves as written notification that failure to comply with regulatory requirements including Humane Methods of Slaughter Act of 1978, could result in additional regulatory or administrative action including suspension.

11. SIGNATURE OF INSPECTION PROGRAM EMPLOYEE

(b) (6)

s.(b)(6)
s.(b)(7)(C)

US Department of Agriculture
FOOD SAFETY AND INSPECTION SERVICE
NONCOMPLIANCE RECORD CONTINUATION SHEET

TYPE OF NONCOMPLIANCE
☐ Food Safety ☒ Other Consumer

1. DATE	2. RECORD NO.	3. ESTABLISHMENT NO.
07/25/2006	0071-2006-4256	00360 M. 1

4. TO (Name and Title)	5. PERSONNEL NOTIFIED
Loeci Moreno, Q.A. Manager- North side	Loeci Moreno (QA Manager)(b) (6)

6. RELEVANT REGULATION(S)
313.1

7. SECTION/PAGE OF EST. PROCEDURE PLAN	HACCP	SSOP	OTHER
			Humane Hr

8. ISP CODE	9. NONCOMPLIANCE CLASSIFICATION INDICATORS
04C02	PRODUCT - Protocol

10. DESCRIPTION OF NONCOMPLIANCE

between the chute and the truck this hog fell approx. 10 to 12 feet onto the concrete below. At the time this non-compliance was observed regulatory control was taken on tag#B8226108 and (b) (6) IIC, Loeci Moreno (Q- and (b) (6) (Kill Floor Manager) were called.

Immediate corrective action was as follows;

HIMP's auditors will audit the hog trucks twice per day for 5 days to insure that truck doors are closed while moving.

This document serves as written notification that failure to comply with regulatory requirements including Hu- Methods of Slaughter Act of 1978, could result in additional regulatory or administrative action., including sus-

11. SIGNATURE OF INSPECTION PROGRAM EMPLOYEE

(b) (6)

FSIS FORM 5400-4 (7/98)
Replaces FSIS Form 5400-4 (9/97), which may be used until exhausted (7/98)

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Page 2 of 2

s.(b)(6)
s.(b)(7)(C)

Decision Memorandum

8 September 2006

To: N. Westgerdes, DVM
District Manager

Through: (b) (6)

From:

Subject: Recommendation for Suspension at Clougherty Packing Co., Est. 00360 M

Recommendation

An egregious violation of the humane handling requirements occurred on Friday, 8 September 2006 while Establishment 00360 M was in Abeyance for an egregious humane handling violation that occurred yesterday, 7 September 2006. Therefore, an immediate reinstatement of the suspension of the assignment of inspectors to the slaughter operation is warranted.

Discussion

On Friday, 8 September 2006, Lead CSI (b) (6) observed a livestock trailer driver attach a metal-cable snare ("deadstick") around a conscious and ambulatory market hog's foreleg and forcibly drag from it the livestock trailer to the off-loading ramp. CSI (b) (6) was observing truck unloading activities to verify that establishment personnel were effectively implementing the actions initiated to address a suspension in the assignment of inspectors. CSI (b) (6) initiated a regulatory control action in accordance with Title 9 Code of Federal Regulations (CFR) Part 313.50(b). The situation was referred the Alameda District Office.

United States Department of Agriculture
Food Safety and Inspection Service
Alameda District #5
620 Central Avenue, Bldg. 2C
Alameda, CA 94501

September 8, 2006

Mr. Joseph Clougherty, President/General Manager
Clougherty Packing Co. Est. 00360 M
3049 East Vernon Avenue
Los Angeles, CA 90058

CERTIFIED RETURN RECEIPT REQUESTED
Facsimile: (323) 584-1672

NOTICE OF REINSTATEMENT OF SUSPENSION

Dear Mr. Clougherty,

This letter confirms the verbal notification given to you on September 8, 2007, by the Food Safety and Inspection Service (FSIS), Alameda District, of the reinstatement of the suspension of the assignment of inspectors for the slaughter process at your establishment, in accordance with FSIS Rules of Practice Title 9 Code of Federal Regulations (CFR) Part 500.3(b). This FSIS suspension action is initiated as a result of your firm's repetitive failure to maintain and implement required controls to prevent inhumane handling of livestock at your establishment, in violation of the Federal Meat Inspection Act (FMIA), 21 U.S.C. 603(b), the Humane Slaughter Act of 1978 (HMSA 1978) 21 U.S.C. Title 7 Chapter 48, Sections 1901-1906 and the regulations promulgated thereunder in Title 9 CFR Part 313.

Specifically, on September 8, 2006, the FSIS Lead Consumer Safety Inspector (CSI) assigned to your establishment, while conducting humane handling verification activities in the truck unloading area, observed a conscious market hog being dragged out of a livestock trailer. The incident occurred in the presence of the Company employee assigned to observe hog unloading activities. This observation was documented on Noncompliance Record (NR) numbered 0089-2006, dated September 8, 2006 which was provided to establishment management on that date. FSIS personnel initiated regulatory control action by placing a U.S. Retain/Reject Tag on the alleyway leading to the stunning area. The NR documents your firm's repetitive failure to adhere to the statutory and regulatory requirements of the humane handling of livestock. In addition, it documents a failure to adhere to the actions taken to prevent recurrence of inhumane handling during livestock trailer unloading which you committed to implement in your agreement with FSIS on September 7, 2006, and which were required as a result of previous humane handling violations and the subsequent suspension of inspection.

On September 7, 2006, FSIS suspended the assignment of inspectors at your establishment based on a similar incident of inhumane handling. The FSIS CSI, assigned to your establishment, while conducting inspection activities in the livestock trailer unloading area of

the facility, observed a market hog fall to the ground from an open side door on the second deck of a three-deck livestock trailer. The occurrence was documented on NR 88-2006, dated September 7, 2006. FSIS personnel initiated a regulatory control action by withholding the marks of inspection. The NR documents your firm's failure to adhere to the statutory and regulatory requirements of the humane handling of livestock.

You submitted to FSIS the following actions, among others, designed to prevent the recurrence of inhumane handling during animal unloading: Clougherty Packing/Farmer John employee(s), who have been trained in humane handling, will conduct 100% observation of hog unloading activities; a checklist of proper unloading procedures will be provided to each livestock trailer driver prior to beginning of unloading activities; the Clougherty Packing/Farmer John employee observing livestock trailer unloading will complete a form documenting that, for each livestock trailer unloaded at the facility, the specified unloading procedures detailed in the above checklist were followed; the resulting documentation will be available for review by FSIS Program employees.

After reviewing your proposal, FSIS placed the Suspension in Abeyance on September 7, 2006, pending verification by FSIS of your firm's effective implementation of the commitments and assurances contained in your proposed corrective action plan, including your verbal assurances made to Alameda District Office staff.

Previous similar incidents of inhumane handling, which resulted in regulatory control actions, were observed and documented on NR 0039-2006, dated May 19, 2006 and NR 0071-2006, dated July 25, 2006. These NRs were for serious noncompliances, including knocking down a disabled animal with a moving front-end loader in the U.S. Suspect pen, allowing a stunned non-ambulatory animal and allowing it to regain consciousness in the U.S. Suspect pen, and allowing an animal to get trapped in a gap between a livestock trailer and the offloading ramp then letting the animal to drop 8-10 feet to the ground. On May 30, 2006 and August 2, 2006, NRs 0045-2006 and 0078-2006 were documented for Establishment employees' failure to consistently and effectively implement with the procedure designed to ensure that the above inhumane handling violations did not recur. In addition, the noncompliance documented for stunning an animal then allowing it to regain consciousness was at no point addressed by Establishment managers.

The ability to respond adequately to humane handling noncompliances and to ensure that the procedures implemented to address the noncompliances are consistently and effectively implemented by Establishment employees is critical to the continued execution of humane handling of livestock in a federally inspected slaughter facility. As established by the above NRs, as well as the egregious violation that occurred this morning and resulted in the reinstatement of the suspension, it is apparent that Clougherty Packing Company has not wholly demonstrated a capacity to ensure that livestock are humane handled by all establishment employees as well as those individuals who are handling animals on behalf of the Company.

The Federal Meat Inspection Act, 21 U. S. C. Sec 603(b) states, *"The Secretary may suspend the slaughtering operations of an establishment if the Secretary finds that any cattle have been slaughtered or handled in connection with slaughter at such establishment by any method not in accordance with sections 1901 to 1906 of Title 7 until the establishment furnishes assurances satisfactory to the Secretary that all slaughtering and handling in connection with slaughter of livestock shall be in accordance with such a method."* Clougherty Meat Packing Company failed to meet the provisions of this section of the Federal Meat Inspection Act.

Based on the above repetitive findings and your failure to meet regulatory requirements for humane handling and slaughter of livestock, and in accordance with Title 9 CFR 500.3(b), FSIS is reinstating the suspension of the assignment of inspectors for the slaughter operations at your establishment.

The suspension of the assignment of inspectors will remain in effect until such time as you provide FSIS, Alameda District Office, adequate written assurances including corrective and preventive measures to assure that livestock at your establishment are handled humanely, in accordance with the FMIA and the regulations promulgated thereunder.

In addition, failure to respond to this notice of suspension adequately, and failure to assure that animals at your establishment are handled humanely in accordance with the statutory and regulatory requirements may result in further administrative enforcement actions including the recommendation to withdraw the grant of inspection from your establishment.

In accordance with Title 9 CFR 500.5(a) (5), you may appeal this action by contacting:

Executive Associate for Regulatory Operations
USDA/FSIS/FO
Room 3157, South Building
1400 Independence Ave., S.W.
Washington DC 20250
Phone: 202-720-3697
Fax: 202-690-3287

In accordance with Title 9 CFR 500.5(d), you may request a hearing concerning this action by contacting:

Director
Evaluation and Enforcement Division
Office of Program Evaluation Enforcement & Review
Food Safety and Inspection Service
United States Department of Agriculture
Congressional Quarterly Building, Room 300
Washington DC 20250
Phone: 202-418-8872

Fax: 202-418-8896

If you have any questions, please call the Alameda District Office at (510) 337-5000, Ext. 241.

Sincerely,

Neal Westgerdes, D.V. M.
District Manager

cc:
A. Malak, DDM/FO
Y. Sharma, DDM/FO
A. Amin, DDM/FO
(b) (6) DVMS/FO
LS/FO
FLS/FO
CS/FO
DA/FO
USDA, IIC, Est. 00360 M
FO/QER

s.(b)(4)
s.(b)(6)
s.(b)(7)(C)

FSIS FORM 6000-31 (08/12/2005)

U.S. DEPARTMENT OF AGRICULTURE
FOOD SAFETY AND INSPECTION SERVICE
OFFICE OF FIELD OPERATIONS

REPORT OF HUMANE HANDLING VERIFICATION VISIT

DISTRIBUTION INSTRUCTIONS:
Submit this report to your Deputy District Manager and the Front-Line Field Supervisor via email.

EST. NO.	DATES DVMS VISITED EST. FROM:	TO:
00360 M	5/15/2007	5/15/2007

NAME AND ADDRESS OF ESTABLISHMENT
Clougherty Packing Co.
3049 E. Vernon Ave., Vernon, CA 90058

NAME OF DVMS: (b) (6)
NAME OF PHV: (b) (6)
(b) (6)

DISTRICT: 05 (Alameda)
CIRCUIT VISITED: 03 (Vernon)

PLANT SIZE: Large

VOLUME/ SPEED: Approx (b) (4) daily/HIMP inspection

SPECIES SLAUGHTERED:
☐ BOVINE ☐ OVINE ☐ EQUINE
☒ PORCINE ☐ CAPRINE ☐ OTHER

CORRELATED WITH: (b) (6) SPHV acting IIC

STUNNING METHOD: Cardiac arrest electrical

REASON FOR VISIT *(Check all that apply):*

- ☒ A. District Office Direction
- ☒ B. Routine Assessment
- ☐ C. Repetitive Non-Compliance
- ☐ D. Egregious Violation
- ☐ E. Data Driven Visit
- ☐ F. Suspicion of Violations
- ☐ G. Religious Exemption
- ☒ H. Special Correlation/Other Assess humane handling by establishment employees at the end of the Suspension Held in Abeyance period.

SUMMARY OF DATA ASSESSMENT PRIOR TO VISIT:

HAT data: a review of five weeks of HAT data indicated that sufficient time was spent verifying humane handling activities.

Noncompliance Records (NR): Since the last DVMS visit in August 2006, five humane handling NRs have been documented: 0078-2006 (8/2/2006) for not following measures (monitoring truck unloading) to prevent recurrence of inhumane handling during truck unloading documented in NR 0071-2006 (7/25/2006); 0087-2006 (9/5/2006) for an opening at the end of the offloading ramp where animals could catch/injure feet and legs; 0088-2006 (9/7/2006) for a hog falling to the ground from the second deck of a triple-deck livestock trailer; 0089-2006 (9/8/2006) for dragging a conscious animal from a livestock trailer; 0113-2006 (11/15/2006) for sharp edges on a metal panel in a holding pen that could cause injury to animals in the pen.

DVMS visits: the most recent DVMS visit occurred on August 2-3, 2006. The following humane handling concerns were documented: ability to ensure humane handling during truck unloading; use of electric and other prod use in the single file chute/restrainer area; ability to consistently stun animals effectively on the first application of the stunning device.

Enforcement Actions: Suspension without Notification on 9/7/2006 for an egregious violation (driving a hog out of a livestock trailer without providing adequate unloading facilities. Reinstatement of Suspension on 9/8/2006 for a second egregious violation (dragging a conscious hog off a livestock trailer). Currently operating under a Suspension Held in Abeyance for humane handling violations.

Systematic Approach	*Does the establishment use a proactive systematic approach to humane handling, perform audits, and record their findings?* Yes
Comments	The establishment has a comprehensive written humane handling program, including animal handling policies in both Spanish and English addressing insensibility, livestock handler duties, appropriate stunning techniques and requirements, and ongoing training in humane handling. There is also a (b) (4) humane handling audit performed by the QC department, and a third-party humane handling audit performed (b) (4) All humane handling records are available for review by in-plant Agency personnel.

s.(b)(4)
s.(b)(6)
s.(b)(7)(C)

RECOMMENDATIONS *(Check only one)*:

- [X] A. No action
- [ ] B. NR by IIC
- [ ] C. NOIE
- [ ] D. Suspension/Withdrawal
- [ ] E. Other

Summary of reason(s) for recommendation:
No regulatory noncompliances were identified during the verification visit.

FINDINGS / Narrative Report

Clougherty Packing Company is a large establishment that exclusively slaughters and processes market swine. Slaughter typically occurs five or six days per week. Animals are brought in from Utah, Arizona, California, Colorado and Nebraska. This establishment recently became part of the Hormel Corporation and completed the transition to the HACCP-Based Inspection Models Project (HIMP) inspection in February, 2006.

On 7 September 2006, Clougherty Packing Company was Suspended without Notification as a result of driving a market hog off a semi-trailer over a drop off without providing adequate unloading facilities, which is identified as an egregious humane handling violation. The Suspension was placed in Abeyance on the same day, 7 September 2006. On 8 September 2006, the Suspension without Notification was reinstated as a result of a second egregious humane handling violation—dragging a conscious hog off a livestock trailer. The Suspension was again placed in Abeyance on the same day, 8 September 2006. Since that time, Clougherty Packing Company has been operating under a Suspension Held in Abeyance for the humane handling and slaughter of livestock.

This humane handling verification visit was conducted for two reasons. First, to assess the company's ability to comply with the legal requirement to humanely handle and slaughter livestock. This assessment will form part of the decision process determining the next step in the enforcement process, that is, to either lift or continue the Suspension in Abeyance. Second, as a routine yearly humane handling verification visit.

On the day of the verification visit, approximately (b) (4) market hogs were scheduled for slaughter. The visit began at approximately 0530 hours. Present for the verification visit were (b) (6) DVMS, (b) (6) (b) (6) SPHV acting IIC, (b) (6) FLS, (b) (6) Operations Manager. (b) (6) (b) (6) Director Livestock Procurement, (b) (6) Livestock Supervisor, and (b) (6) (b) (6) Director Technical Services, were present for part of the verification visit.

Truck Unloading:
Animals are generally brought in on double deck livestock trailers, although there is an occasional single level trailer hitched to a pick-up truck. Truck unloading occurs 24 hours per day, stopping only on Friday evening and Saturday morning. Per establishment managers, it takes approximately (b) (4) to unload one double deck truck. There are two offloading ramps; however, only one truck is unloaded at a time.

The planned changes to the scale housing which would allow two trucks to be unloaded simultaneously are nearing completion. The changes to the scale housing include reconfiguring the flow of animals through the holding pens. (b) (4)

(b) (4)

(b) (4) Per establishment managers, the new scale housing should be completed within a few months.

(b) (4)
(b) (4) The day of the verification visit was cool and cloudy, so this activity was not observed occurring.

(b) (4)
(b) (4) Per establishment managers, the offloading ramps are (b) (4)

(b) (4)

Per establishment managers, and confirmed by IPP, the majority of the livestock trailers that arrive during normal slaughter operations at the facility arrive during the morning. Since the previous verification visit, signs about moving hogs calmly and handling non-ambulatory hogs have been posted on one the side of one of the offloading ramps.

The following measures to prevent recurrence of inhumane handling during truck unloading were initiated by establishment managers in response to the Suspension:

- Clougherty Packing/Farmer John employees will conduct 100% observation of hog unloading activities.
- Establishment employees assigned to observe hog unloading activities are trained in humane handling.
- No truck drivers are allowed to unload animals.
- A form will be completed by the company observer documenting each truck and that proper procedures were followed. The documentation will be available for review.
- All Farmer John employees are to be trained in proper handling procedures to be used when unloading and moving animals.

Approximately (b) (4) animals were observed being unloaded during observation of truck unloading on the day of the verification visit. Typically, there was a livestock trailer at each of the two unloading docks and three or four trailers waiting to unload. Establishment employees performed all the unloading and moving animals into the drive alleys. Rattle paddles, hog panels, voice and hands to move the animals from the trucks onto the offloading ramp. Hogs were moved in small groups, quietly and at a walk. Establishment employees were observed monitoring humane handling during unloading of livestock trailers.

Agency in-plant personnel did not express concerns with handling during truck unloading. No humane handling regulatory noncompliances were observed during truck unloading.

Procedures for handling non-ambulatory / disabled:
Per establishment managers, there are two methods of handling non-ambulatory or disabled animals identified in trucks. (b) (4)

There is a written protocol for handling non-ambulatory and disabled animals in the holding pens. There are several small front-end loaders (b) (4) having a bucket and partial cover, used to move non-ambulatory and disabled animals to the "U.S. Suspect" pen. Animals condemned on antemortem inspection are (b) (4) Hogs passed on antemortem inspection are (b) (4)

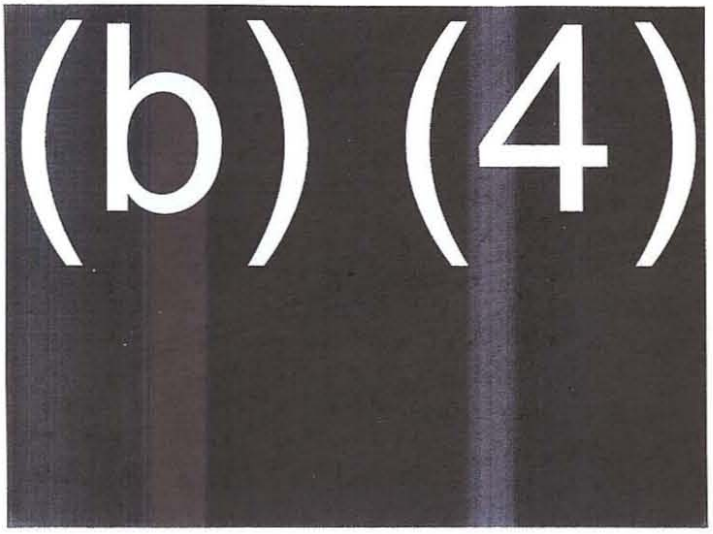
Approximately 35 non-ambulatory/disabled hogs were observed during the verification visit. Of the 30 hogs, approximately eight hogs were observed to become non-ambulatory while moving through drive alleys. The ambulatory hogs were moved around the non-ambulatory hogs, which were then (b) (4) Approximately 22 non-ambulatory/disabled hogs were observed in the "U.S. Suspect" pen. After antemortem inspection, all the hogs in the pen were (b) (4) Establishment employees performing the stunning operation were observed to check for signs of consciousness prior to loading the animals into the front-end loader. Approximately five hogs became non-ambulatory or disabled in the single file chutes leading to the restrainer in the stunning area. Establishment employees opened the appropriate panel on the side of the single file chute. Hogs that could ambulate walked out of the single file chute, were stunned with a portable penetrating captive bolt stunning device then shackled, hoisted and moved to the shackle table. Hogs that were non-ambulatory were stunned in situ, shackled, hoisted and moved to the shackle table. The company employee stunning the non-ambulatory/disabled hogs was observed to check some hogs for signs of consciousness prior to shackling.

Agency in-plant personnel did not express concerns with handling of Suspect or disabled animals. No humane handling regulatory noncompliances were observed during handling non-ambulatory/disabled animals.

Suspect / Handling facilities:
An "U.S. Suspect" pen is present and meets regulatory requirements. Per IPP, a second pen near the offloading ramps is being designated as a "U.S. Suspect" pen in order to minimize the amount of handling required for non-ambulatory/disabled hogs unloaded from livestock trailers. This pen also meets the regulatory requirements for an "U.S. Suspect" pen. Per establishment managers, it hasn't yet been decided if both pens will continue to be designated as "U.S. Suspect" pens.

Facilities Conditions:
Holding pens are made with either cement walls or heavy gauge hog wire mesh panels forming either (b) (4) (see photo below). Per establishment managers, they have recently begun changing to the (b) (4) The two curving drive alleys leading from the new scale housing near the offloading ramps have high solid walls made of cement block. The holding pens have overhead water misters for cooling during hot days. Drive alley floors and the serpentine alley leading to the single file chutes ("irons") are impressed cement with solid cement walls. The holding pens and drive alleys are covered with a solid, flat, corrugated metal roof. The sides are open, but on two sides of the holding pen area, there are tall walls in close proximity to the holding pen building. There are two

side-by-side single file chutes made of metal pipes with heavy-duty plastic sides. Per establishment managers, the pens and alleyways are cleaned (b) (4)



Agency in-plant personnel did not express concern about facilities-based issues. No facilities-based regulatory noncompliances were observed during the verification visit.

Pen Stocking:
Stocking density met regulatory requirements. All animals observed in the holding pens during the verification visit were able to easily move around the pens and reach water. The regulatory requirements addressing stocking density were discussed with establishment managers during the verification visit.

Feed / Water Availability:
Water is supplied to all pens via (b) (4) Water was observed to be available to all holding pens during the verification visit. In-plant Agency personnel did not express concern over access to water.

During the verification visit, two hogs were observed being held in one of the unused curved drive alleys leading from the new scale housing near the offloading ramps. The second hog was only visible after entering the drive alley and walking around the curved section of wall. Per establishment managers, the hogs became weak and unable to walk normally while being moved to the stunning area. They were put in the nearby alleyway to rest and recover before being moved into the serpentine alley. Because this was a designated alleyway, there was no access to water in the area. Establishment managers were unable to quantify the amount of time that the hogs had been held in the alleyway, but asserted that it could not have been very long.

The regulatory requirement for access to water in holding pens was discussed with establishment managers and Agency in-plant personnel at the time of the observation and again during the exit meeting. During the initial discussion, establishment managers were firmly of the opinion that because the hogs were in an alleyway, not a designated holding pen, there was no requirement to ensure access to water. Agency policy is that alleyways are for animals transiting from one area to another; animals do not stay in alleyways longer than needed to move from one place to another. However, if designated alleyways are used to hold animals in one place, as was the case with the two hogs observed above, that area is functioning as a holding pen and must meet the regulatory requirements for holding pens. Establishment managers stated that they understood the Agency's position on access to water for animals being held, regardless of the designated name of any particular area in the facility.

Per establishment managers, animals are typically kept in the holding pens for approximately (b) (4) (b) (4) although some animals (b) (4) Animals kept in the (b) (4) are provided with corn. This procedure was confirmed by in-plant Agency

personnel. Feed was observed to be present at the facility and on the floors of some holding pens during the verification visit. In-plant Agency personnel did not express concern over feed availability.

Flooring non-slip:
Floors are made of cement with a (b) (4) into the cement to improve footing. The depth of scoring and design of the floors appeared to provide sufficient footing for the species of animal being slaughtered.

A large number of the holding pens have recently been re-surfaced, incorporating (b) (4) to facilitate good footing. Pens in the process of being re-grooved are not used to hold animals. IPP did not express concern with slips and falls.

Per establishment managers, they are working on meeting or exceeding the humane handling recommendations made in the American Meat Institute's Animal Welfare Guidelines, revised 2007. The revised version includes evaluation of slips and falls in the livestock trailers during transport and unloading.

Evaluation of slips/ falls:

- **in crowd pen, truck unloading, and barn area:**

Approximately 200 animals were observed being moved into and out of the holding pens, through the drive alleys and through the serpentine chute to the stunning area. One animal was observed to slip while moving out of a livestock trailer. No animals were observed to fall in these areas.

- **at single file chute and stunning box:**

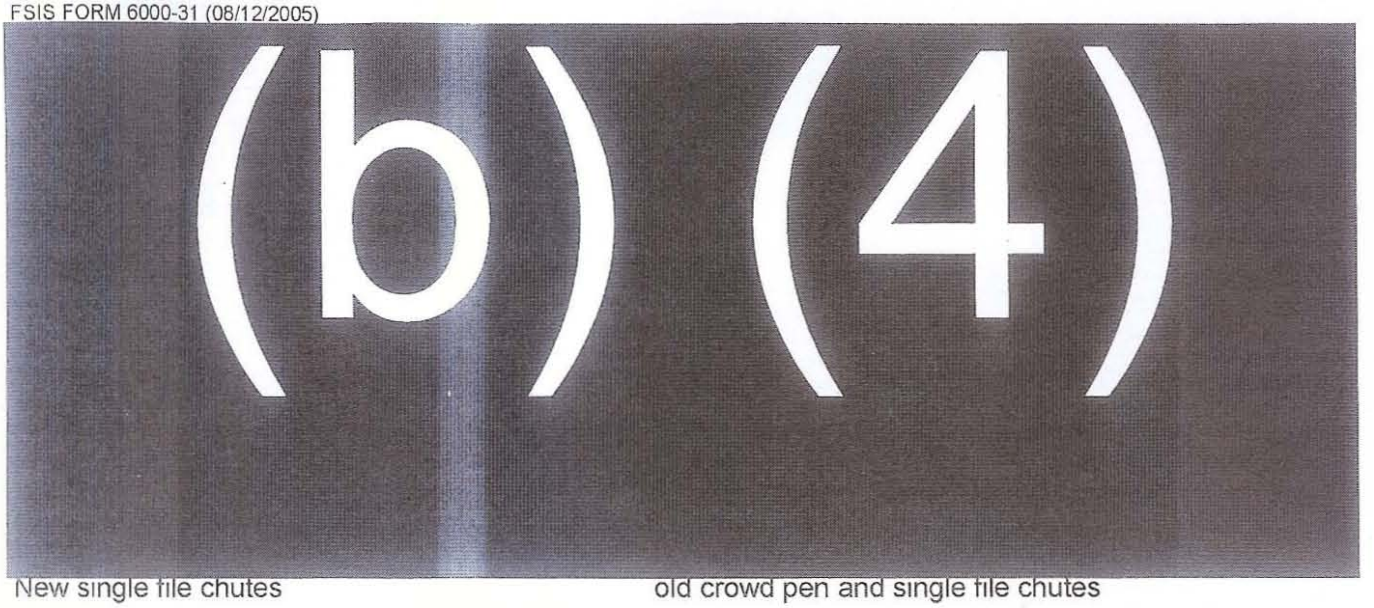
Approximately 200 animals were observed being moved into and out of the holding pens, through the drive alleys and through the serpentine chute to the stunning area. No animals were observed to slip or fall in these areas.

Evaluation of prod / alternative implement use:
Rattle paddles, voice, hands and hog panels are used to move animals off the livestock trailers, through the drive alleys and into and out of the holding pens. Per establishment managers, use of electrified prods is prohibited in the holding pens and drive alleys.

Rattle paddles and (b) (4) electrified prods wired into house current are used to move hogs through the single file chutes and into the moving restrainer.

Since the August 2006 humane handling verification visit, the approach to the restrainer has reconfigured. Per establishment managers, the reconfiguration had been discussed prior to the verification visit but implementation of the change was accelerated as a result of the concern with prodding documented during the previous verification visit. The new approach (b) (4)

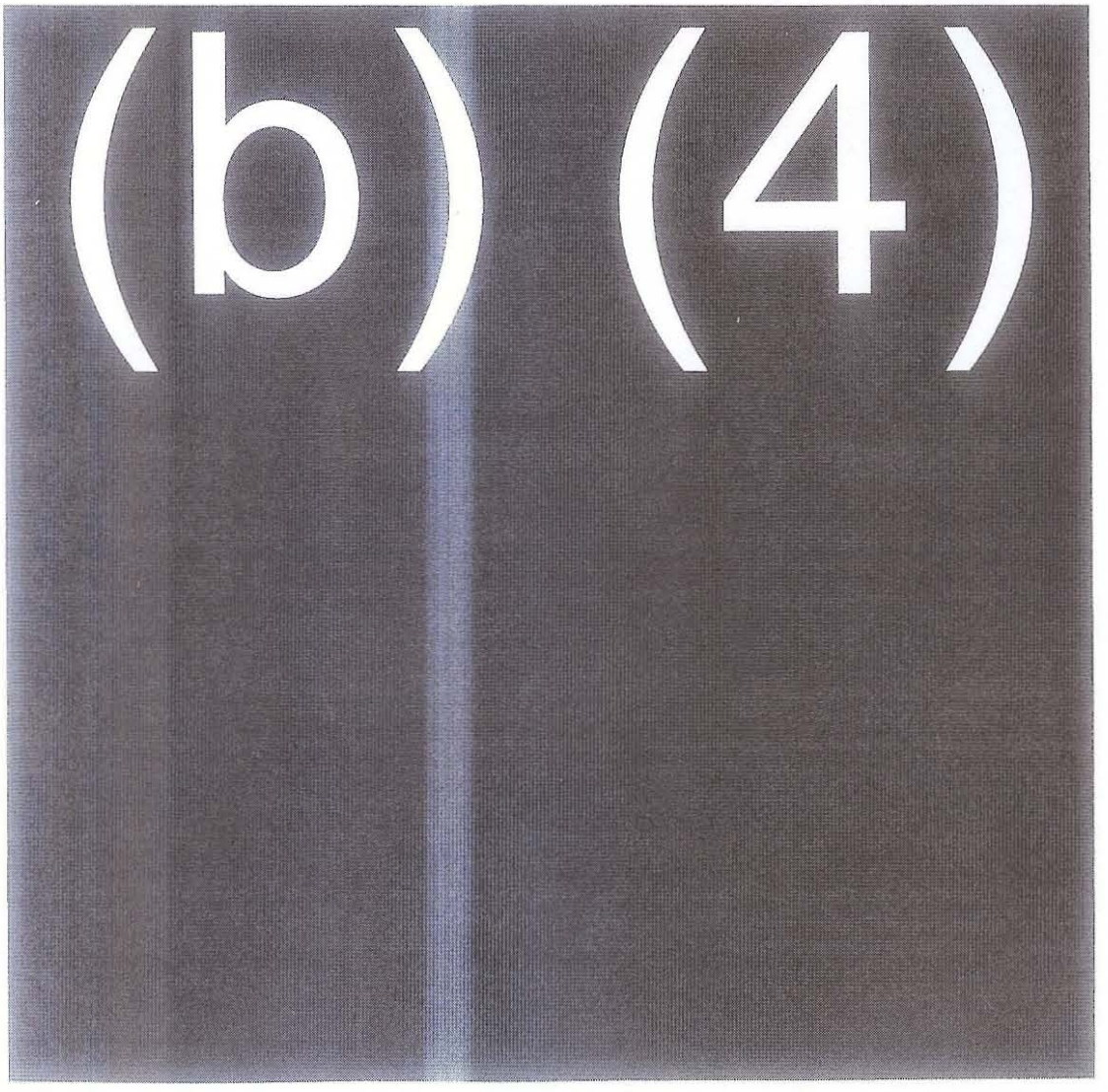
(b) (4)



New single file chutes

old crowd pen and single file chutes

Additionally, signs in both English and Spanish have been posted on the wall opposite the single file chutes have been posted. The signs address prod use, non-ambulatory animals, handling techniques and the Clougherty Packing Company humane handling mission statement. (see photos below).



- **in stunning area:**

Rattle paddles were observed being used to move animals through the crowd pen and into the single file chutes. There were also (b) (4) electrified prods available to be used in the single file chute and the area just prior to the restraining chute. They were wired into the house electrical system. When tested, the voltage measured (b) (4) IPP did not express concerns about the amount of prodding observed in this area.

Approximately 300 animals were observed moving through the crowd pen and single files chutes. Of the 300 animals, three were observed to be prodded with the electrified prod. Rattle paddles were primarily used to move the hogs through the single file chutes. Typically, the rattle paddle was tapped on the side of the chute, although a number of hogs were also tapped on the back. The electrified prod was only used when an animal completely balked at entering the restraining chute.

Approximately four hogs were observed to refuse to move forward through the single file chutes. Establishment employees opened the side panels on the single file chute to release the hogs. They were then moved back into the serpentine alleyway. One of the four hogs walked out of the single file chute then walked directly into a nearby unused portion of the original irons. When it reached a dead end, a company employee stunned it with a portable penetrating captive bolt stunning device, shackled and hoisted it before moving it to the shackle table.

- **in other areas:**

Rattle paddles were observed being used to move the animals into and out of the holding pens and through the main drive alleys. There were also hog panels available to be used if needed. Animals were moved in small groups at a walking pace. For the most part, the paddles were tapped on the floor or fences behind the animals. Rarely, the paddle was observed being used to touch the back or hindquarters of animals. Per establishment managers, company policy (b) (4) (b) (4) Hand held electrified prods were available for use in the holding pens and drive alleys, but were not observed being used.

Approximately 500 animals were observed moving through the holding pens and drive alleys. No regulatory noncompliances were identified.

It was readily noticeable that there was a significant decrease in the amount of prodding and vocalization in the single file chutes and entrance to the restrainer compared to the previous verification visit. The hogs moved readily from the serpentine alley into the single file chutes and restrainer. The number of hogs balking in the single file chutes and at the entrance to the restrainer was minimal. There was also a noticeable decrease in the number of hogs struggling and vocalizing while in the restrainer. This can be attributed, at least in part, to the delivery of calm animals to the restrainer. Delivery of calm animals to the stunning device operator has the additional effect of making it easier deliver an effective application of current, thus enhancing stunning effectiveness.

Evaluation of vocalizing:
Vocalization was heard at a normal level for the species and number of animals present in the facility.

Verification of stunning efficacy:
Animals are moved into the stunning restrainer on a moving restraint conveyor controlled by the stunning device operator. Stunning is accomplished by (b) (4) (b) (4) This stunning device recently installed as a result of concerns about stunning effectiveness expressed by Agency in-plant personnel. The device (b) (4) (b) (4) This represents a change from the previous stunning device, which (b) (4) (b) (4) Per establishment managers, (b) (4)

(b) (4)

(b) (4)

(b) (4) see photo below).

Per establishment managers, the stunning equipment, including (b) (4) are cleaned and checked (b) (4) Maintenance records are kept and available for review.

(b) (4)

One hundred animals were observed during the stunning procedure and to determine stunning efficacy. All animals were effectively stunned by the first application of the electrical stunning device while in the conveyor restrainer. The stunning device operator would wait until excited animals calmed down sufficiently to allow appropriate placement of the (b) (4)

Verification of unconsciousness:

Once stunned (b) (4)

(b) (4) Near the shackle table, there are (b) (4) available to re-stun any animals identified as showing signs of return to consciousness.

There is still an establishment employee stationed at the shackle table whose responsibility it is to re-stun, using the portable penetrating captive bolt device, any animal that has been ineffectively stunned or is showing signs of a return to consciousness. This was done in response to NR 0001-4303 (01/03/2006), when an animal was observed to begin to regain consciousness but no action was taken by establishment employees. Since the previous humane handling verification visit, the shackle table has been changed so (b) (4) Per establishment managers, this was done to (b) (4)

Approximately 30-40 feet from the shackle table, the bleed rail curves around and another establishment employee stands at the curve monitoring signs of consciousness in animals hanging on the bleed rail. There is another (b) (4) for use at this point. This

s.(b)(4)

procedure is part of a preventive measure put in place several years ago after a NR was generated for a conscious animal on the bleed rail. Per in-plant Agency personnel, this employee is observed using the captive bolt device (b) (4) however, per establishment management that action is taken as a precaution, not because signs of consciousness are identified.

One hundred animals were observed for signs of consciousness on the rail after stunning. Observation occurred in three different places: immediately after stunning at the bleeding station on the shackle table, approximately 15 feet from the shackle table, and shortly before entering the scald tank. No animals were observed to be conscious or beginning to regain consciousness while hanging on the bleed rail. However, nine animals were observed to be re-stunned with the portable penetrating captive bolt device while lying on the shackle table and many more detonations of the captive bolt device were heard coming from the shackle table area while observation was occurring in other sections of the stunning area.

It appeared that all of the nine animals observed to be re-stunned on the shackle table were re-stunned in an excess of caution—no signs of a return to consciousness were observed. It appeared that if the hog had an exaggerated tonic-clonic response to the electrical stunning on reaching the captive bolt operator, it was re-stunned. The establishment employees at the shackle table were observed to be checking the hogs for signs of consciousness.

There is a concern that ineffective or inadequate stunning may result in conscious animals on the bleed rail, although no conscious animals were observed during the verification visit. This concern results from the number of animals identified as needing to be re-stunned. Although there is an establishment employee stationed at the shackle table to ensure that no conscious animals are hung on the bleed rail, the Humane Methods of Slaughter Act of 1978 requires that animals are rendered unconscious by a single blow or application of the stunning method. Per Agency policy, it is not acceptable humane handling to rely on a second application of stunning to ensure an animal remains insensible to pain throughout the entire process of becoming a carcass.

This concern was discussed with establishment managers during the verification visit and again during the exit conference. The possible consequences of having a conscious animal on the bleed rail or having repeated and regular ineffective stunning were clearly articulated. Establishment managers confirmed that they knew and understood the policy, requirements and possible consequences of repeated or egregious humane handling violations.

Ritual Slaughter:
No ritual slaughter occurs at this facility.

Other:
The way in which establishment managers adapts it facilities and handling practices during inclement weather to ensure the humane handling of animals was discussed.

Per establishment managers, livestock trucks arrival times (b) (4)

(b) (4)

(b) (4)

(b) (4)

However, discussions with their corporate headquarters have delayed implementation of the change.

Humane handling is monitored by establishment mangers and records are kept, including maintenance on stunning devices, stunning effectiveness (discussed in the Verification of Stunning Efficacy section above), livestock trailer unloading, and humane handling. The company's daily humane handling audit includes (b) (4) The form has been recently updated to include (b) (4) in response to the changes made to the AMI Animal Welfare Guidelines. During a review of the (b) (4) humane handling audits, it was noted that all the audits reviewed were started between (b) (4) The advisability of performing humane handling audits randomly throughout the slaughter day was discussed with establishment managers at the time of the review and again during the exit meeting.

Third party humane handling audits by (b) (4) occur at least (b) (4) driven by supplier requirements. Per establishment managers, the most recent third-party humane handling audit scored in (b) (4) Farmer John also have a (b) (4) that meets regularly; per establishment managers, a (b) (4) is in the process of being created. Per establishment managers, humane handling training for relevant establishment employees occurs, at a minimum, on a (b) (4) basis in both English and Spanish.

An exit meeting began at approximately 1330 hours. Present were (b) (6) DMVS, (b) (6) (b) (6) SPHV acting IIC, (b) (6) FLS, (b) (6) Vice President, (b) (6) Operations Manager, (b) (6) Technical Services Director, and (b) (6) Director Livestock Procurement. The findings of the humane handling verification visit were discussed, including the identified humane handling concerns about using alleyways to hold animals and stunning effectiveness.

There was considerable discussion about and correlation on the Agency's humane handling policies, requirements and expectations. Of particular note was the improvement in the use of electrified prods and vocalization in the single file chutes and stunning area. The meeting concluded at approximately 1410 hours.

COMPANY RESPONSE
NON-COMPLIANCE RECORD

DATE ISSUED: 9am 8/7/06

NR NUMBER: 88-06

RELEVANT REGULATION(S): 313.1

DESCRIPTION OF NONCOMPLIANCE: Please refer to the NR

IMMEDIATE ACTION:

1) The affected chute was tagged. The affected hog was inspected and released. The truck driver did not follow the Trucking Unloading Policy. Carrier was contacted and a disciplinary action was requested to be taken for this truck driver for not following the animal welfare policies.
2) Kill floor operations were withheld for approximately 4 hours until corrective action was written, sent to the district manager and approved.

FURTHER PLANNED ACTION:

1) A Clougherty Packing/Farmer John employee was assigned to conduct 100% observation of hog unloading activities. This person has been trained in humane handling.
2) A checklist of proper unloading procedures will be given to each truck driver prior to the unloading activities beginning. This documentation will be available for USDA review.
3) A form will be completed be the company observer documenting each truck and that proper procedures were followed. This documentation will be available for USDA review.
4) Clougherty packing Company will work with all carriers to ensure that each truck driver has been certified according to the Trucker Quality Assurance (TQA) guidelines. In addition, we will require them to present their TQA card or number prior to unloading. This step will require one month for full implementation.
5) No one will be allowed to unload a truck that has not been certified according to the TQA guidelines.

SIGNATURE: _____

DATE: 9/9/06

US Department of Agriculture
FOOD SAFETY AND INSPECTION SERVICE
NONCOMPLIANCE RECORD CONTINUATION SHEET

TYPE OF NONCOMPLIANCE: ☐ Food Safety ☒ Other Consumer Protection

1. DATE	2. RECORD NO.	3. ESTABLISHMENT NO.
09/07/2006	0088-2006-4256	00360 M / 1

4. TO (Name and Title)
Kevin Mead, Director of Quality Assurance

s.(b)(6)
s.(b)(7)(C)

5. PERSONNEL NOTIFIED
(b) (6) (Hog pen Supervisor) (b) (6) (Dir

6. RELEVANT REGULATION(S)
313.1

7. SECTION/PAGE OF EST. PROCEDURE PLAN	HACCP	SSOP	OTHER
			HAT II (Humane Handl

8. ISP CODE	9. NONCOMPLIANCE CLASSIFICATION INDICATORS
04C02	PRODUCT - Protocol

10. DESCRIPTION OF NONCOMPLIANCE

to fall out of the trailer (approx. 4 to 4-1/2 feet) onto its back on the ground below. At this time regulatory control was taken on tag# B8225531 and (b) (6) Hog Pen Supervisor) was called. When (b) (6) arrived I (Insp. (b) (6) explained the situation and advised (b) (6) hat a non-compliance under ISP code 04C02 (Humane Handling) would be issued.

Driving animals off semi-trailers over a drop off without providing adequate unloading facilities has been identified as an egregious act.

A similar non-compliance with the same cause was issued on 7/25/2006 on NR# 71-2006; an acceptable long term corrective action has not been received by agency personnel as of this date.

This matter was referred to the Alameda District Office at which time per (CFR500.3(b) a withholding action was initiated.

This document serves as written notification that failure to comply with regulatory requirements including Humane Methods of Slaughter Act of 1978, could result in additional regulatory or administrative action including suspension.

11. SIGNATURE OF INSPECTION PROGRAM EMPLOYEE

(b) (6)

FSIS FORM 5400-4 (7/98)
Replaces FSIS Form 5400-4 (9/97), which may be used until exhausted (7/98)

DISTRIBUTION: Original & 1 Copy to Establishment, 1 Copy to Inspector
Page 2 of 2

000273

US Department of Agriculture
FOOD SAFETY AND INSPECTION SERVICE
NONCOMPLIANCE RECORD

TYPE OF NONCOMPLIANCE
☐ Food Safety ☒ Other Consumer Protection

1. DATE	2. RECORD NO.	3. ESTABLISHMENT NO.
09/08/2006	0089-2006-4256	00360 M / 1

s.(b)(6)
s.(b)(7)(C)

4. TO (Name and Title)
Kevin Mead, Director of Quality Assurance

5. PERSONNEL NOTIFIED
(b) (6) QA Supervisor), (b) (6) (H

6. RELEVANT REGULATION(S)
313.2

7. SECTION/PAGE OF EST. PROCEDURE PLAN	HACCP	SSOP	OTHER
			Humane Handling

8. ISP CODE	9. NONCOMPLIANCE CLASSIFICATION INDICATORS
04C02	PRODUCT - Protocol

10. DESCRIPTION OF NONCOMPLIANCE

While performing off-hours verification if humane handling during truck unloading at approx. 0300 hours of 9/8/2006. CSI (b) (6) observed the following egregious non-compliance with regulatory requirements. Verification in this area occurred to specifically observe Company action initiated to prevent recurrence of inhumane handling during truck unloading, in response to a Notice of Suspension, dater September 7, 2006. Hogs were observed being unloaded from one of two trucks parked at the offloading dock. As offloading of animals was nearing completion, a second truck driver,(same trucking company) proceeded to enter the back of the truck to drive the last hogs onto the unloading ramp. At this time, CSI (b) (6) was standing at the bottom of the unloading ramp. CSI (b) (6) noted that a hog began persistently squealing inside of the truck being unloaded which prompted CSI (b) (6) to go into the unloading ramp to determine why the animal in the truck was vocalizing. Inspector (b) (6) observed that the second driver had attached a "dead stick" to a front leg of the vocalizing hog. A "dead stick" is a metal handle with a loop of wire cable attached at the end. The driver was observed to have the wire cable loop securely fastened around a front leg of the vocalizing hog and was exerting a determined pulling action on the metal pole portion of the "dead stick" as a way of forcing the animal to move forward. Initially the hog was on its feet but as the driver continued to force the animal to move, the hog resisted and fell onto its side. The driver responded by continuing to drag the hog until the hog was approximately halfway out the truck unloading door. Then the

(b) (6)

306.5 and/or 381.35 of 9 CFR

13. PLANT MANAGEMENT RESPONSE (further planned action(s)):

This document serves as written notification that your failure to comply with regulatory requirement(s) could result in additional regulatory or administrative action.

14. SIGNATURE OF PLANT M (b) (6) 15. DATE

16. VERIFICATION SIGNATU EMPLOYEE 17. DATE 03/27/07

FSIS FORM 5400-4 (7/98)
Replaces FSIS Form 5400-4 (9/97), which may be used until exhausted (7/98)

DISTRIBUTION: Original & 1 Copy to Establishment, 1 Copy to Inspector
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000274

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US Department of Agriculture
FOOD SAFETY AND INSPECTION SERVICE
NONCOMPLIANCE RECORD CONTINUATION SHEET

TYPE OF NONCOMPLIANCE
☐ Food Safety ☒ Other Consumer Protection

1. DATE	2. RECORD NO.	3. ESTABLISHMENT NO.
09/08/2006	0089-2006-4256	00360 M / 1

4. TO (Name and Title)
Kevin Mead, Director of Quality Assurance s.(b)(6) s.(b)(7)(C)

5. PERSONNEL NOTIFIED
(b) (6) QA Supervisor) (b) (6) H

6. RELEVANT REGULATION(S)
313.2

7. SECTION/PAGE OF EST. PROCEDURE PLAN	HACCP	SSOP	OTHER
			Humane Handling

8. ISP CODE	9. NONCOMPLIANCE CLASSIFICATION INDICATORS
04C02	PRODUCT - Protocol

10. DESCRIPTION OF NONCOMPLIANCE

driver released the cable and the hog stood up and ran down the unloading ramp. Inspector (b) (6) initiated a regulatory control action at approximately 0400 hrs and US Retain tag# B8225532 was affixed to the alley way leading to the stunning area, in accordance with 9 CFR 313.50(b). (b) (6) (QA Supervisor) was notified, (b) (6) was advised that a non-compliance record under ISP code 04C02 would be issued and the matter would be referred to the Alameda District Office for possible further enforcement action in accordance with the Rules of Practice 9 CFR 500.3(b). Additionally, CSI (b) (6) notified acting FLS (b) (6)

11. SIGNATURE OF INSPECTION PROGRAM EMPLOYEE

(b) (6)

COMPANY RESPONSE
NON-COMPLIANCE RECORD

DATE ISSUED: 9am 8/8/06

NR NUMBER: 89-06

RELEVANT REGULATION(S): 313.1

DESCRIPTION OF NONCOMPLIANCE: Please refer to the NR

IMMEDIATE ACTION:

1) The alley way leading to the stunning area was tagged by the FSIS inspector.
2) Kill floor operations were withheld until corrective action was written and approved by USDA.

FURTHER PLANNED ACTION:

1) Clougherty Packing/Farmer John will assume all responsibilities for all activities associates with the unloading of hogs from the trucks. This is effective immediately. This will include hourly and supervisory positions.
2) Truck drivers will be prohibited from any unloading activity.
3) The carrier has been advised that the offending party is not allowed to bring loads to farmer John. We have also informed the carrier that the truck drivers must take directions from the company personnel when they are on our property.
4) All Farmer John employees are trained in proper handling procedures to be used when unloading and moving the hogs.

SIGNATURE: _____

DATE: 9/12/06

ATTACHMENT 3

THE HUMANE SOCIETY
OF THE UNITED STATES

September 29, 2008

Docket Clerk
U.S. Department of Agriculture
Food Safety and Inspection Service
Room 2534
South Agriculture Building
1400 Independence Avenue, SW
Washington, DC 20250

Submitted electronically at www.regulations.gov

Re: Requirements for the Disposition of Cattle That Become Non-Ambulatory Disabled Following Ante-Mortem Inspection; Proposed Rule

Docket Number: FSIS–2008–0022

Introduction

The Humane Society of the United States (HSUS), the nation's largest animal protection organization, supported by 10.5 million constituents, welcomes the opportunity to submit comments to USDA's Food Safety and Inspection Service (FSIS) on its proposed rule regarding Requirements for the Disposition of Cattle That Become Non-Ambulatory Disabled Following Ante-Mortem Inspection, 73 Fed. Reg. 50889 (August 29, 2008) ("Proposed Rule").

In the following comments, HSUS addresses a number of positive aspects of the Proposed Rule, as well as identifies immediate actions that are warranted both to improve the welfare of animals and to reduce risks to human health.

I. Summary of Comments

The Proposed Rule is long overdue and, in the interests of animal welfare and food safety, should be finalized immediately:

- The Proposed Rule is necessary under the Federal Meat Inspection Act (FMIA) because of the food safety risks of allowing any downed cattle to be slaughtered (including bovine spongiform encephalopathy (BSE), *E. coli*, and *Salmonella*).
- The Proposed Rule is also necessary under the Humane Methods of Slaughter Act (HMSA), which requires that all livestock be treated humanely in connection with slaughter.
- The Proposed Rule, including a requirement that the establishment notify FSIS inspectors when cattle become non-ambulatory after antemortem inspection, is urgently needed so that establishments are no longer incentivized to use any means necessary to get sick and injured cattle to slaughter.

Additional actions the agency should take immediately in conjunction with finalizing the Proposed Rule include:

- Issuing an emergency rule, effective immediately, to apply the ban on non-ambulatory cattle to auctions, markets, stockyards, and transport vehicles, and require immediate humane euthanasia of all non-ambulatory cattle when they arrive at a facility (including a slaughter facility) in that condition or when they become non-ambulatory at the facility, or, in the alternative, issuing a proposed rule that would apply the downer ban to non-ambulatory cattle at these facilities and require their immediate humane euthanasia, and soliciting comments on these reforms.
- Issuing proposed rules addressing other welfare problems for sick and injured animals, including:
    - Prohibiting egregious practices inflicted upon any animal not standing or with a broken limb, such as forcefully striking the animal with an object, dragging the animal, ramming or otherwise attempting to get the animal to stand using heavy machinery, or using electric shock, water pressure, or other extreme methods.
    - Requiring that all non-ambulatory animals—not just cattle—be condemned and humanely euthanized.
- Substantially reworking the agency's oversight and inspection systems to ensure humane treatment of live animals at slaughter facilities.

II. Background

The Prohibition on the Use of Specified Risk Materials for Human Food and Requirements for the Disposition of Non-Ambulatory Disabled Cattle, 69 Fed. Reg. 1,862, 1,870 (Jan. 12, 2004) ("2004 Interim Rule") instructed USDA veterinary inspectors to condemn any cattle at slaughter plants deemed "nonambulatory disabled," defined as any cattle who "cannot rise from a recumbent position or…cannot walk, including, but not limited to, those with broken appendages, severed tendons or ligaments, nerve paralysis, fractured vertebral column, or metabolic conditions."[1] Since BSE can result in an animal going down either directly, because of brain damage, or indirectly, by predisposing an animal to injury, these downed cattle were to be condemned rather than slaughtered for human consumption.

The same day that the regulations were published, however, USDA issued Notice 5-04, instructing inspecting veterinarians how to carry out the regulations. FSIS Notice 5-04, Interim guidance for non-ambulatory disabled cattle and age determination (January 12, 2004). In contrast to both the public claims by USDA and the Interim Rule itself, the agency instructed inspectors to allow downed cattle to be slaughtered for human consumption if they initially appeared otherwise healthy but went down within the slaughter plant itself due to an acute injury (e.g., if the animal falls and breaks a leg). *Id*. This was quite imprudent since underlying disease in general, and BSE in particular, may make an animal disoriented, weak, or uncoordinated and thereby predispose an animal to an injury sustained in a fall.

Linda Detwiler, former senior staff veterinarian in charge of USDA's BSE surveillance program, strongly opposed any attempt to weaken the definition of "downer" to exclude those downed presumably solely from injury in written comments submitted to USDA. "I urge the USDA to not alter this definition," she wrote, "and to continue to prohibit for human food any bovine which cannot walk to the 'knock box' [slaughter area] regardless of reason."[2]

Because illness may predispose an animal to injury, Dr. Detwiler argued that the underlying cause of the non-ambulatory condition may be impossible to ascertain. In other words, a broken leg might just be a symptom of a more serious problem, such as BSE. At least three of the documented cases of BSE in North America were identified as downers due to injury, not illness,[3,4,5] underscoring how difficult it is for inspectors to reliably determine which non-ambulatory animals may be "safe."

The first case of BSE discovered in Canada was thought to be "suffering from a broken leg."[6] The first case of BSE discovered in the United States similarly did not seem to display any BSE symptoms—the cow was reported down due to a birthing injury that reportedly interfered with her ability to walk.[7] She was seemingly picked at random as one of perhaps less than 1% of the downed cows tested for mad cow disease in the United States at that time.[8] Similarly, a third North American case was suspected of injury rather than disease. The farmer reportedly "didn't suspect anything was seriously wrong when one of his cows slipped on the ice and hurt itself…."[9]

Furthermore, it is difficult to examine cattle in recumbency.[10] A 2003 review asserts that clinical examinations "should always be thorough" and that "a precise 'cow-side' diagnosis can, on occasions, be very difficult." The review concludes: "It should always be considered that two or more conditions may present simultaneously in a downer cow…."[11] Bovine veterinarian Jim Reynolds of the University of California's School of Veterinary Medicine reportedly agrees: "It is very, very difficult for a veterinarian to differentiate the many reasons a cow may be non-ambulatory."[12]

In 2006, the USDA Office of the Inspector General (OIG) criticized the agency for its inconsistent application of policies and regulations related to downed animals after observing non-ambulatory cattle processed at two slaughter plants. In a review of 12 slaughter plants observed over the period June 17, 2004, to April 12, 2005, the OIG found that 29 downed cattle were slaughtered for human food. They "observed use of a forklift and a rail above the pens to transport non-ambulatory cattle to the slaughter area." The audit noted the lack of documentation on the animals' fitness for human consumption.[13]

In July 2007, USDA finally made permanent its so-called "ban" on slaughtering downer cattle. But instead of closing the loophole identified by the OIG, the agency codified it, acknowledging that some downer cattle have been, and will continue to be, processed for human food. USDA's 2007 Final Rule specifies that "FSIS inspection personnel will determine the disposition of cattle that become non-ambulatory after they have passed ante-mortem inspection on a case-by-case basis." Prohibition of the Use of Specified Risk Materials for Human Food and Requirements for the Disposition of Non-Ambulatory Disabled Cattle; Prohibition of the Use of Certain Stunning Devices Used To Immobilize Cattle During Slaughter, 72 Fed. Reg. 38700 (July 13, 2007) ("2007 Final Rule"). In other words, cattle who are able to stand or walk when initially inspected by USDA but then keel over and cannot stand up again can nevertheless be slaughtered, and the meat can be sold, although it is unlikely cattle would keel over this way absent mishandling unless there is underlying illness.

III. The Proposed Rule

A. The Proposed Rule should be finalized immediately.

As USDA had previously had a total ban on the slaughter of downed cattle in place publicly from 2004 to 2007—which was issued within three weeks after the first diagnosis of bovine spongiform encephalopathy (BSE, or mad cow disease) in the United States, and took effect immediately—the agency has all the research and comments necessary to act immediately to restore the complete prohibition on slaughtering cattle too sick or injured to stand and walk. 2004 Interim Rule at 1870. Of approximately 22,000 public comments that USDA received on the Interim Rule's policy (including those from industry), more than 99% urged USDA to maintain and strengthen the downer ban, expanding it to cover other species and making the prohibition permanent.[14] Circumstances have not changed in any way that could possibly undermine the eminent wisdom of immediately reinstating the more complete ban of 2004 to 2007. On the contrary, as discussed fully below, recent events and well established science all counsel for reinstating that ban without any delay.

USDA has the authority to make a complete ban on the slaughter of downed cattle effective immediately under the Administrative Procedure Act. 5 U.S.C. § 553. Not only was such authority exercised in the 2004 Interim Rule on downed cattle, it was also exercised in 2006 when the agency issued an interim final rule to continue operations at horse slaughter plants after Congress defunded inspections at such plants in the FY 2006 Agricultural Appropriations Act. Ante-Mortem Inspection of Horses, 71 Fed. Reg. 6337 (February 8, 2006). In that case, USDA claimed that potential economic damage to horse slaughter plants justified the decision to dispense with the notice and comment period and issue regulations immediately. *Id*. at 6340. If the purely financial threat to just two horse slaughter operations merits dispensing with notice and comment, there can be no rational explanation for not having the Proposed Rule to close the downer loophole take effect immediately as well. As the Hallmark/Chino slaughter plant investigation and subsequent massive beef recall and resultant damage to consumer confidence as well as international trade relations makes abundantly clear, the economic harm alone of the current downer loophole clearly justifies having the regulations take effect immediately.

The threat to the domestic and international beef trade is rooted in the far more serious threat to public health posed by allowing downed cattle into the foodsupply. In 2004, when USDA first adopted the ban on the slaughter of downed cattle, it explained that downed cattle are far more likely to be infected with BSE than cattle who are able to stand and walk. 2004 Interim Rule at 1870. Given studies suggesting that non-ambulatory cattle may have a prevalence of BSE more than 100 times that of ambulatory animals,[15] tissues from all so-called "fallen stock" in Europe cannot even be used in animal feed.[16]

Such prominent industry organizations as the American Meat Institute, National Meat Association, and National Milk Producers Federation all called months ago (in April 2008) for a total ban on processing any downer cattle and petitioned USDA to close this downer loophole. In 1995, Temple Grandin, Ph.D., advisor to the American Meat Institute and others in the meat industry, cautioned that "[o]ne emaciated, downed, suffering cow shown on television can cause more losses to the industry" than all other costs associated with carcass condemnation.[17]

B. The Proposed Rule is necessary under the Federal Meat Inspection Act (FMIA) because of the food safety risks (including BSE, *E. coli*, and *Salmonella*) of allowing any downed cattle to be slaughtered.

Every year in the United States, estimates range from 195,000[18] to more than 1 million[19] cattle who collapse for a variety of metabolic, infectious, toxic, and/or musculoskeletal reasons and are too sick or injured to rise.[20] Extrapolating from the proportion of non-ambulatory cattle found in European[21] and U.S.[22] surveys, the number of non-ambulatory cattle in the United States may be on the order of 500,000 a year. A governmental survey of dairy producers across 21 states reportedly found that 78.2% of dairy operations had non-ambulatory cows during 2004.[23] Though these animals may not have been fit enough to stand, a limited investigation of USDA slaughter plant records between January 1999 and June 2001 showed that most were still ruled fit for human consumption.[24]

Aside from the serious welfare implications of mistreatment of downed animals, the practice of slaughtering them for the human food supply raises significant food safety concerns. Studies have shown that non-ambulatory cattle suffer from higher rates of foodborne pathogens such as *E. coli*, *Salmonella*, and BSE.[25]

BSE is a transmissible spongiform encephalopathy (TSE) of cattle that may manifest with behavioral symptoms, earning the disease its colloquial name "mad cow disease." The rendering of sheep infected with an ovine spongiform encephalopathy (known as scrapie) into cattle feed may have led to the emergence of BSE.[26] In animal agriculture, protein concentrates, or "meat and bone meal"—terms that encompass "trimmings that originate on the killing floor, inedible parts and organs, cleaned entrails, fetuses"[27]—are fed to naturally herbivorous dairy cows, for example, to improve milk production.[28] According to the World

Health Organization, nearly 10 million metric tons of slaughter plant waste is fed to farm animals every year.[29]

Based on clear findings in Europe[30] as well as the speculative evidence of a rare form of mad cow disease striking downed cows for decades in the United States,[31] non-ambulatory cattle should be considered to be a particularly high-risk population. According to the U.S. Food and Drug Administration (FDA): "Experience has shown that non-ambulatory disabled cattle…are the population at greatest risk for harboring BSE."[32] The FDA cites Swiss data showing a 49-58 times higher chance of finding BSE in downed cattle than in cattle reported to veterinary authorities as BSE-suspect under passive surveillance.[33] Indeed, at least 14 of the 18 BSE-infected cattle discovered in North America by August 15, 2008, have reportedly been non-ambulatory.[34,35,36,37,38,39,40,41,42,43,44,45,46,47]

Though the riskiest tissues—the brains, eyes, and spinal cords—of most cattle are required to be excluded from most food items in the United States,[48] there may be contamination of muscle meat via aerosolization of the spinal cord during carcass splitting.[49] Significant amounts of central nervous system debris found accumulating in the splitting saws used to halve the carcasses may have the potential to then transfer contagion from one carcass to the next.[50] Although technically, processors are instructed to knife-trim "material grossly identifiable as brain material, spinal cord, or fluid from punctured eyes,"[51] researchers have reported finding nervous tissue contaminating muscle in commercial slaughter plants.[52] Contamination of meat derived from cattle cheeks with brain tissue can also occur if the cheek meat is not removed before the skull is fragmented or split.[53]

Captive bolt stunning, the predominant method used to render cattle insensible before exsanguination,[54] may blow a shower of embolic brain tissue into the animals' bloodstream. In one experiment, a biological marker applied onto a stunner bolt was later detected within the muscle meat of the stunned animal. The researchers concluded:

> This study demonstrates that material present in...the CNS [central nervous system] of cattle during commercial captive bolt stunning may become widely dispersed across the many animate and inanimate elements of the slaughter-dressing environment and within derived carcasses including meat entering the human food chain.[55]

Captive bolt stunning may also lead to ejection of brain tissue into the abattoir from the hole made by the captive bolt onto slaughter plant equipment, as well as the hands and aprons of workers removing the animals' heads.[56] A study published in 2004 in the *Journal of Food Protection* determined that "this method of slaughter of an animal infected with bovine spongiform encephalopathy would be likely to contaminate edible parts of the carcass with infective material."[57] Texas A&M University researchers found brain fragments in the bloodstream of cattle stunned for slaughter as large as 14 cm (5.5 in). The researchers concluded that it was likely that BSE pathogens could potentially be "found throughout the bodies of animals stunned for slaughter."[58]

Despite the potential for CNS contamination and the fact that peripheral nerves[59] and blood[60] found in all muscles may carry infection, USDA[61] and the National Cattlemen's Beef Association[62] have attempted to assure consumers that beef is safe to eat, arguing that the infectious agent is not found in muscle meat. However, Stanley Prusiner, the director of the Institute for Neurodegenerative Diseases at the University of California, San Francisco, and winner of the Nobel Prize in Medicine for his discovery of prions, the cause of BSE and other TSEs, showed that muscle cells themselves were capable of producing the potentially infectious agent.[63] "I found prions in the hind limb muscles of mice," Dr. Prusiner stated, "at a level approximately 100,000-fold higher than that found in blood."[64] Dr. Prusiner reportedly described the studies relied upon by the Cattlemen's Association as "extraordinarily inadequate,"[65] and follow-up studies in

Germany confirmed his findings, showing that animals who are orally infected may indeed end up with prion contamination throughout the muscles of their bodies.[66]

Although few cattle have tested positive for BSE in the United States thus far, the neurodegenerative disease that contaminated beef can cause in consumers is likely invariably fatal. Because cooking temperatures do not adequately destroy prions, the onus of responsibility must rest with the beef industry or, if unable or unwilling to police itself, the federal government, to ensure infected cattle are not slaughtered for human consumption. There is evidence that the infectious proteins that cause BSE can survive incineration[67] at temperatures hot enough to melt lead.[68] In response to a question from Cornell University's Food Science Department asking what food preparation methods could eliminate the risk of contracting BSE, then National Institutes of Health Laboratory of Central Nervous System Studies chief Joseph Gibbs remarked tongue-in-cheek that one of the only ways to ensure a BSE-free burger would be to marinate it in a concentrated alkali such as Drain-O™.[69]

Even USDA itself, in its 2004 Interim Rule, alluded to this concern as an additional reason to end the use for human food of any downed cattle, not just some of their body parts, noting that "[u]nder the current testing methods, which are conducted on sections of the brain or spinal cord, certain tissues of cattle infected with BSE…may contain BSE infectivity even though the diagnostic test does not show that the animal has the disease." 2004 Interim Rule at 1870.

BSE is not the only food safety risk posed by slaughtering downed cattle for human consumption. Texas A&M University researchers were among the first to alert the medical community of the potential for non-ambulatory cattle to present a vehicle to contaminate the human food supply with bacterial pathogens. They studied 30 downed cattle who had no outward signs of illness, except for inability to rise, and had all passed antemortem inspection. Even though these non-ambulatory animals appeared otherwise healthy, when the researchers took bacterial cultures, they found cows infected with *Salmonella* and *E. coli*. The researchers concluded: "Results of this study of 30 cattle indicate that pathogens may be circulating in the blood of some recumbent cattle at the time of slaughter."[70] Commenting on areas of concern, the scientists noted:

> It should be remembered that much of the meat from recumbent cattle goes into the production of ground beef, which, because of the grinding process and extra time it spends at a temperature higher than the whole carcasses, usually attains a high bacterial cell count per gram by the time processing is finished. Contaminated meat used to make ground beef would also contaminate subsequent clean meat exposed to common machinery (eg, grinders) and, thus, would increase the danger of contamination.[71]

The majority of non-ambulatory cattle are dairy cows.[72] Virtually all dairy cows are ultimately slaughtered for human consumption in the United States.[73] Annually, 6 million culled dairy cows enter the food chain as ground beef,[74] accounting for at least 17% of the ground beef produced in the United States.[75]

According to a 2003 review, downed dairy cows "may harbor greater numbers of pathogens, and their slaughter may increase spread of pathogens at the slaughter establishment."[76] In industry trade magazine *Meat & Poultry*, research is cited to explain why non-ambulatory cattle tend to have higher levels of bacteria on their carcasses: "Lame animals spend more time lying down, which increases the likelihood they will be contaminated with fecal matter."[77] In addition to the potential for contamination of the meat with fecal pathogens, when dairy cows are slaughtered, "[k]nives, carcasses and the hands of personnel may be contaminated by contents of the mammary gland when this is removed from the cow during processing."[78] Intramammary infections (mastitis) affect up to nearly two-thirds of cows in the U.S. dairy herd[79] and are one of the most common reasons dairy cows are sent to slaughter.[80] Inappropriate excision of the udder during the slaughter process can contaminate the rest of the carcass with milk that could contain *Listeria* and other milk-borne pathogens. A 1997 review of the microbiological hazards of eating meat from culled dairy cows

concluded: “In the USA, dairy cattle are raised and managed with increasing intensification, and this intensification may promote the maintenance of a variety of micro-organisms which could be pathogenic to humans through food.”[81]

In 2003, a USDA-funded study was published that investigated the “potential impact to human health that may occur following consumption of meat derived from downer dairy cattle,” by measuring infection rates of one of the most virulent foodborne pathogens, *E. coli* O157:H7. The investigators found that downed cows were 3.3 times more likely to harbor the potentially deadly *E. coli* strain than walking culled dairy cows. The researchers concluded that “downer dairy cattle harboring *E. coli* O157:H7 at slaughter may be an important source of contamination and may contribute to the health risk associated with ground beef.”[82] The results of this study led USDA Microbial Food Safety Research Unit Research Leader John B. Luchansky to question whether, based on *E. coli* alone, non-ambulatory cattle should be excluded from the U.S. meat supply.[83]

E. coli O157:H7 infects tens of thousands of Americans every year, causes dozens of deaths,[84] and may be the leading cause of acute kidney failure in previously healthy U.S. children.[85] Speculatively blamed in part on the increasing intensification of the dairy industry,[86] prevalence rates in U.S. dairy herds have ranged up to 100%.[87] Quoting USDA researcher Caitriona Byrne and colleagues: “Due to the ubiquity of *E. coli* O157:H7 among cattle, as well as its low infective dose and the severity of the resistant illness in humans, effective control of the pathogen may be possible only by eliminating this microorganism at its source rather than by relying on proper food handling and cooking thereafter.”[88]

A 2005 review in the *Journal of Dairy Science* likewise concentrated on the risk of contracting virulent strains of *E. coli* from eating ground beef from slaughtered dairy cows that may be tainted with fecal material. These toxin-producing strains can cause hemorrhagic colitis and progress to kidney failure, coma, and death, particularly in young children.[89] Dairy cattle “enter the food chain as ground beef,” the review reports, and “[a]s a result, downer dairy cows harboring STEC [Shiga toxin-producing *E. coli*] at slaughter can be a health risk to humans.”[90]

According to Robert Tauxe, Chief of the Foodborne and Diarrheal Diseases Branch of the Centers for Disease Control and Prevention (CDC), one hamburger may reportedly be made from the flesh of hundreds or even thousands of different cows.[91] One mathematical model suggests that a single downed cow infected with a pathogen such as *E. coli* O157:H7 could theoretically contaminate more than 100,000 hamburgers with an infectious dose.[92]

Salmonella infection hospitalizes thousands of Americans every year, kills hundreds, and can lead to chronic conditions such as arthritis, bone infections, cardiac inflammation, and neurological disorders.[93] According to the CDC, *Salmonella* strains in the United States are growing resistant to nine different antibiotics.[94] One strain, known as *Salmonella* Newport MDR-AmpC, is even growing resistant to ceftriaxone, a powerful antibiotic vital for combating serious infections in children.[95]

Multiple outbreaks of this new multidrug-resistant *Salmonella* strain have been tied to dairy farms,[96] ground beef made from slaughtered dairy cows,[97] and dairy products.[98] Investigating one deadly outbreak of antibiotic-resistant *Salmonella* involving hundreds of people, California public health officials traced the cases back to meat from infected dairy cows slaughtered for hamburger. In their report published in the *New England Journal of Medicine*, the researchers correlated risk of contamination with the slaughter plants that received the most moribund and dead cattle. The researchers noted: “Stressed animals are more likely to shed *Salmonella* in large numbers.”[99]

In addition to the immunosuppressive effect of stress, non-ambulatory animals may also be more likely to shed pathogenic bacteria “[s]ince animals going to slaughter are generally in a temporary state of starvation, and it is known that starvation causes *E. coli* and *Salmonella* to proliferate” due to changes that occur in the

animal's rumen. By the time most cattle are slaughtered, they have been starved for variable periods of time, in part because empty rumen are easier to eviscerate.[100] This may be particularly relevant to downed cattle populations who may be left to starve for extended periods before they are finally slaughtered.

Carolyn Stull of the University of California-Davis School of Veterinary Medicine has studied *Salmonella* infection in downed cows and reported results at a 2004 American Meat Institute conference. Fifty downed cows were sampled and seven were found to be infected with *Salmonella*. Despite infection, however, five of the seven infected cows, including at least one cow who was septicemic, were known to have passed USDA antemortem inspection for human consumption.[101] Dr. Stull and her colleagues reportedly identified 6 out of 20 non-ambulatory cattle sent to a slaughter facility to be fecal shedders of *Salmonella*.[102]

Anthrax is a farm animal disease that can infect, though very rarely, the human meat supply.[103] In 2000, 32 farms were quarantined for anthrax in the United States.[104] That summer, at least five people were exposed to meat "highly contaminated" with anthrax when a family ate meat from its own downed steer. These cases were reported by the CDC as "Human Ingestion of *Bacillus Anthracis*-Contaminated Meat."[105] Had a ban on the slaughter of downed cattle been in effect, these people may have been spared. Based on these cases, the CDC recommended veterinarians consider anthrax as a possible diagnosis in cattle unable to rise. Subsequently, a family stricken with gastrointestinal, oropharyngeal, and meningeal anthrax tied to the consumption of a sick sheep was reported,[106] one example of how the health risks associated with non-ambulatory animals are not limited to cattle.

C. The Proposed Rule is also necessary under the Humane Methods of Slaughter Act (HMSA), which requires that sick and injured animals be treated humanely. The HSUS investigation at the Hallmark/Westland Meat Packing Company demonstrates that establishments will treat downed animals inhumanely in order to exploit any loophole in the downer ban.

As discussed above, investigations by HSUS[107] and others[108,109,110] have documented that "downed" cattle are routinely beaten, dragged with chains, shocked with electric prods, pushed by forklifts, and forced to endure other abuses in efforts to move them at slaughter facilities, compounding the pain these animals already suffer as a result of the injury or illness causing their immobility.

Citing "egregious violations of humane handling regulations" documented during HSUS' investigation, FSIS suspended inspection of the Hallmark/Westland Meat Packing Company, and the Agricultural Marketing Service (AMS) temporarily suspended the slaughter plant's vendor status, making it ineligible to sell beef to the federal government.[111] Prior to this action, Westland had been the second-largest supplier of beef to AMS and the National School Lunch Program, supplying beef to schools in 47 states and D.C., and it had been honored by USDA as "Supplier of the Year" during the 2004-2005 academic year.

As a result of the illegal handling and slaughter of non-ambulatory cattle, and the introduction of these animals into the food chain, USDA called upon the now defunct company to conduct the largest meat recall in U.S. history.[112] The investigative findings of downed cattle mistreatment and allegations of non-ambulatory animals being slaughtered for human consumption also prompted congressional reaction,[113] led school districts to pull beef from their menus,[114] and cast widespread doubt on the reliability of the USDA inspection process.[115]

The Humane Methods of Slaughter Act, 7 U.S.C. §§ 1901 *et seq.*, provides that "the slaughtering of livestock and the handling of livestock in connection with slaughter shall be carried out only by humane methods."

7 U.S.C. § 1901. As long as any loopholes remain in the ban that allow downed cattle to be slaughtered, even if only under limited circumstances, there will remain the risk of inhumane treatment.*

Responsible producers already work to prevent animals from getting sick or injured, and euthanize those who become non-ambulatory while they're still on the farm. A study by a veterinarian with the California Department of Food and Agriculture determined the net value of a downed animal sent to slaughter was just $28.70.[116] According to USDA, before the ban announced in December 2003, downers comprised just 0.4-0.8% of all cattle slaughtered annually in this country.[117]

A bright-line, comprehensive ban will help incentivize producers and transporters to engage in responsible husbandry and handling practices, reducing the number of non-ambulatory cattle to levels approaching zero. Dr. Grandin has noted that as many as 90% of all downer cases are preventable.[118] Since "[h]andling a downer dairy cow in a humane manner is almost impossible,"[119] she writes, "[t]he best way to improve the welfare of non-ambulatory (downer) cattle is to prevent them."[120]

The Proposed Rule rightly acknowledges that a loophole in the disposition of downed cattle may cause establishments to present sick or injured cattle for slaughter in the hope that such cattle will be ambulatory just long enough to be slaughtered. Therefore, it correctly requires that all non-ambulatory disabled cattle be considered unfit for human consumption, and thus adulterated. Only such a bright line rule will be truly enforceable and will not rely on an inherently subjective process prone to mistakes and abuse.

According to the Proposed Rule, about 1,300 downed cattle were slaughtered for human food in 2007 following re-inspection under the loophole, and that does not even count an untold number of downers who were illegally moved to slaughter without benefit of an inspector's reevaluation (as was documented in the Hallmark/Westland footage). The current flawed rule depends on plant workers summoning a USDA inspector back to reevaluate an animal who becomes non-ambulatory after initial inspection, in order for the inspector to decide if the animal can be slaughtered, a system that seems bound to fail given the enormous pressure plant workers are under by their company superiors to move the maximum number of animals quickly to slaughter. This system also depends on inspectors making snap judgments about the perceived health and safety of each downed animal, when we know how difficult, if not impossible, it is for inspectors to determine the full reason(s) behind a particular animal's inability to stand and walk and when injury and illness are often interrelated. And the current system disregards the humane concerns for those cattle who become non-ambulatory after antemortem inspection: even if "only" a broken leg is involved, dragging an animal with a fracture is just as cruel, if not more so. Anyone who has ever suffered a broken limb can imagine the pain of being pulled by chains or rammed with a forklift in that condition.

D. The Proposed Rule, including a requirement that the establishment notify FSIS inspectors when cattle become non-ambulatory after antemortem inspection, is urgently needed so that establishments are not provided an incentive to use any means necessary to get sick and injured cattle to slaughter.

The HSUS investigation at the Hallmark/Westland Meat Packing Company demonstrates the food safety risk and burden that is placed on the nation's food supply when the regulatory scheme contains loopholes allowing establishments to circumvent the ban. Rather than simply expose one company's abusive practices,

* For this reason, HSUS objects that the Proposed Rule does not remove the loophole concerning veal calves, adopted in the 2007 Final Rule, which allows non-ambulatory veal calves who cannot stand or walk to be held indefinitely. 9 C.F.R. § 309.13(b). This language is vague, it does not provide any standard for the time and conditions under which such calves may be held, and it does nothing to protect the downed calves from being subjected to the same types of cruelty documented in the Hallmark/Westland investigation.

however, this investigation led to the inescapable conclusion that there are severe shortcomings in USDA's policy on handling downer cattle and the agency's oversight of live animals at slaughter plants.

In the background section of the Proposed Rule, USDA makes explicit reference to the findings at the Hallmark/Westland Meat Packing Company, noting that this "recent significant event highlighted a vulnerability in the inspection system that needs to be addressed." Proposed Rule at 50890. USDA goes on to predicate the requirement that the establishment notify FSIS inspectors when cattle become non-ambulatory after antemortem inspection on the notion that "[t]his regulatory requirement should preclude establishments from attempting to force such animals to rise." *Id*. at 50891.

HSUS concurs with this requirement as it is a significant improvement over the existing loophole, which allows FSIS personnel to make a case-by-case determination regarding the disposition of these animals and contributed to the egregious acts of cruelty documented during the investigation of the Hallmark/Westland Meat Packing Company. The affirmative obligation to notify inspection personnel when cattle become non-ambulatory after antemortem inspection must not be tied to the possibility that these cattle will subsequently be approved for slaughter.

IV. Additional Actions the Agency Should Take Immediately

A. USDA should take this opportunity to issue a rule extending the downer cattle ban to auctions, markets, stockyards, and transport vehicles, and requiring immediate humane euthanasia of all non-ambulatory cattle when they arrive at a facility (including a slaughter facility) in that condition or when they become non-ambulatory at the facility.

In June 2008, five months after releasing the findings of the Hallmark/Westland Meat Packing Company investigation, HSUS released the results of subsequent investigations at five livestock auctions that revealed the continued abuse of downed cattle. At the Portales Livestock Auction in New Mexico, for example, the HSUS investigator observed the sale of three downed cows who had been tormented to get them into the auction area. Details of the mistreatment of downed cattle that was observed include: downed cows repeatedly shocked in an attempt to get them to rise; a downed cow being dragged by a chain around one leg, pulled by a Bobcat tractor, with the animal's leg severely hyper-extended; and a downed cow forced to crawl on her front knees by workers who repeatedly shocked her.[121]

The fact that abuses were observed at these facilities even after so much national and international media attention had shone a spotlight on the mistreatment of downed cattle in the United States suggests that the abuses documented at the Hallmark/Westland Meat Packing Company were not an aberration or isolated case. Indeed, HSUS's subsequent auction investigations found abuses to non-ambulatory cattle at each of the five sites visited. As such, it is critical that the ban on downed cattle be extended to the more than 1,200 markets and auctions that operate around the nation, as well as stockyards and transport trucks.

Immediate and humane euthanasia of all non-ambulatory cattle at auctions, markets, stockyards, slaughter facilities, and on transport vehicles regardless of the reason(s) an animal is non-ambulatory should be required. This should include confirmation of clinical death prior to carcass disposal.

Non-ambulatory cattle should be considered veterinary medical emergencies, as stated by Stull *et al*.,[122] and should be humanely euthanized immediately. Methods deemed acceptable—when performed properly by veterinarian or trained personnel—include captive bolt, gunshot, or, if not proscribed by the rendering facility, barbiturate-containing euthanasia solution.[123]

In addition, death should be verified prior to disposal of the animal's body. Confirmation of death should include all three of the following indicators, each absent for more than five consecutive minutes: 1) lack of

heartbeat (determined with stethoscope, not pulse); 2) lack of respiration; and 3) lack of corneal reflex. Visible rigor mortis can also serve to confirm death, when observed over a longer period, but only after the three indicators above have already been observed.

USDA should issue an emergency rule, effective immediately, applying the Proposed Rule's comprehensive ban to these additional facilities and requiring immediate humane euthanasia while comments are solicited for a final rule. Congress has expressly charged USDA with promulgating regulations to provide for the humane treatment of non-ambulatory livestock "by stockyards, market agencies, and dealers." 7 U.S.C. § 1907. As explained above, in the past USDA has exercised its authority to issue interim final rules pursuant to the Administrative Procedure Act, 5 U.S.C. § 553, and should not hesitate to do so in this instance in light of the serious humane treatment and food safety risks at stake.

In the alternative, USDA should immediately issue a proposed rule extending the downed cattle ban to auctions, markets, stockyards, and transport vehicles, and requiring immediate humane euthanasia of downed cattle, and move quickly to solicit comments and issue a final rule to adopt these urgent reforms.

B. USDA should take this opportunity to issue proposed rules addressing other welfare problems for sick and injured animals, including:

1. Egregious practices on any animal not standing or with a broken limb, such as forcefully striking the animal with an object, dragging the animal, ramming or otherwise attempting to get the animal to stand using heavy machinery, or using electric shock, water pressure, or other extreme methods should be prohibited.

At the Hallmark/Westland Meat Packing Company, the HSUS investigator witnessed blatant and commonplace cruelties inflicted on animals daily in which employees purposefully ignored regulations meant to prevent the torment and abuse of downed animals simply so they could get them into the kill box. The investigator filmed workers ramming cows unable to stand with the blades of a forklift; jabbing them in the eyes; applying painful electrical shocks, often in sensitive areas; dragging them with chains attached to apparently broken limbs, pulled by heavy machinery; and torturing them with a high-pressure water hose to simulate drowning, in attempts to force crippled animals to walk to slaughter. In one case, he videotaped a cow who collapsed on her way into the stunning box. After she was electrically shocked and still could not stand, she was shot in the head with a captive bolt gun to stun her and then dragged on her knees into slaughter. It is important to note that these were not isolated incidences of mistreatment of downed cattle, but deliberate acts that happened routinely at the plant.

This year's HSUS investigations are not alone in uncovering such scandalous and abusive treatment of downed cattle, they are just the most recent. Others[124,125,126] have also documented cruelties inflicted upon crippled cattle in efforts to move them at slaughter facilities.

Although such abuse may be currently condemned in FSIS directives to its inspectors—this is wholly inadequate because these directives (1) do not have the force of law; (2) may be easily amended or completely obviated without observance of the Administrative Procedure Act public participation requirments; and (3) are not directed to the industry, but rather just to inspectors. An ever-shifting patchwork of non-binding directives distributed to inspectors is simply not a substitute for clear lawfully promulgated regulations.

2. The humane euthanasia of all non-ambulatory livestock—not just cattle—should be required.

Like downed cattle, non-ambulatory pigs, sheep, and other mammals suffer when they are dragged by chains, shoved by forklift, and subjected to electric shock or other cruel means to try to get them on their feet for

slaughter. They also may be at heightened risk of transmitting disease to consumers. For example, experimental[127] and epidemiologic[128] evidence suggests that pigs may harbor a porcine spongiform encephalopathy. Although studies have not been conducted to investigate potential pathogen concerns for downed livestock of other species, they may also be more likely to harbor foodborne bacteria such as *E. coli* and *Salmonella*, as these non-ambulatory animals also often wallow in bacteria-laden waste and may have higher levels of intestinal pathogens due to stress.

C. USDA should immediately institute reforms to improve oversight of live animals at slaughter plants

Many of the problems revealed by our undercover investigation at Westland/Hallmark stemmed from inadequate oversight of live animals and their handling, despite a full cadre of five inspectors present at the facility while egregious abuses were routinely occurring. USDA can and should institute many needed reforms to its inspection regime without rulemaking. For those reforms requiring rulemaking, we urge the agency to begin the rulemaking process expeditiously.

USDA must ensure that inspectors are observing live animals when they first arrive at slaughter plants and as they are offloaded and handled in pens and chutes, and that they are acting to avert violations of the Humane Methods of Slaughter Act and regulations pursuant to that law, as well as regulations regarding nonambulatory animals. To meet these goals, the following combination of reforms should be implemented:

1. More inspectors are observing live animals;

2. All inspectors are trained and directed to monitor the treatment of live animals to ensure that they are handled humanely. Inspectors must understand that their oversight responsibilities begin at the moment animals arrive at slaughter premises, including when the animals are on trucks at slaughter facilities;

3. An inspector is meeting each truck when it arrives on the premises and ordering the immediate humane euthanasia and condemnation of any livestock who are non-ambulatory;

4. Inspections are unannounced and not on a predictable schedule;

5. In-person inspections are supplemented with video surveillance as needed to allow for viewing of all animal handling, from the time each animal arrives at the slaughter premises through the time of death. Video footage should be preserved for forensic purposes so that it is possible to go back and look at particular scenes to determine if violations occurred;

6 Inspectors are rotated to ensure that they do not become too close with plant personnel; and

7. USDA personnel – under the Office of Inspector General or otherwise – are conducting undercover investigations at slaughter plants, to provide a significant deterrent against violations and expand on the capacity of private nonprofit organizations to carry out such investigations.

V. Conclusion

The Proposed Rule is long overdue and, in the interests of animal welfare and food safety, should be finalized immediately:

- The Proposed Rule is necessary under the Federal Meat Inspection Act (FMIA) because of the food safety risks of allowing any downed cattle to be slaughtered (including BSE, *E. coli*, and *Salmonella*).
- The Proposed Rule is also necessary under the Humane Methods of Slaughter Act (HMSA), which requires that all livestock be treated humanely in connection with slaughter.
- The Proposed Rule, including a requirement that the establishment notify FSIS inspectors when cattle become non-ambulatory after antemortem inspection, is urgently needed so that establishments are no longer incentivized to use any means necessary to get sick and injured cattle to slaughter.

Additional actions the agency should take immediately in conjunction with finalizing the Proposed Rule include:

- Issuing an emergency rule, effective immediately, to apply the ban on non-ambulatory cattle to auctions, markets, stockyards, and transport vehicles, and require immediate humane euthanasia of all non-ambulatory cattle when they arrive at a facility (including a slaughter facility) in that condition or when they become non-ambulatory at the facility, or, in the alternative, issuing a proposed rule that would apply the downer ban to non-ambulatory cattle at these facilities and require their immediate humane euthanasia and soliciting comments on these reforms.
- Issuing proposed rules addressing other welfare problems for sick and injured animals, including:
    - Prohibiting egregious practices inflicted upon any animal not standing or with a broken limb, such as forcefully striking the animal with an object, dragging the animal, ramming or otherwise attempting to get the animal to stand using heavy machinery, or using electric shock, water pressure, or other extreme methods.
    - Requiring that all non-ambulatory animals—not just cattle—be condemned and humanely euthanized.
- Substantially reworking the agency's oversight and inspection systems to ensure humane treatment of live animals at slaughter facilities.

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ATTACHMENT 4

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Health of non-ambulatory, non-injured pigs at processing

Mhairi A. Sutherland [a,*], Keith Erlandson [b], Joe F. Connor [b], Janeen L. Salak-Johnson [c], Paul Matzat [d], Jerry F. Smith [a], John J. McGlone [a]

[a] *Pork Industry Institute, Department of Animal and Food Sciences, Texas Tech University, Lubbock, TX 79409, United States*
[b] *Carthage Veterinary Services, Ltd., Carthage, IL 62321-0220, United States*
[c] *Department of Animal Science, University of Illinois, Urbana, IL 61801, United States*
[d] *Elanco Animal Health, Greenfield, IN 46140, United States*

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Abstract

Loss of pigs during or after transport is a welfare concern, but also an economic concern for producers. Transport losses include animals that are dead on arrival (DOA) at the plant, pigs that are injured, and pigs which are not obviously injured but unwilling or unable to walk (non-ambulatory, non-injured or NANI). The objective of this research was to assess the health of non-ambulatory, non-injured (NANI) pigs relative to control pigs at the processing plant by looking at a range of measures, including complete blood chemistry, anatomy, and pathology to determine potential factors associated with pigs going down. Data were collected from NANI and control pigs at five plants in the midwest USA. Feet and legs and internal organs were inspected and the severity of the pathology scored. Alveolar macrophages were collected and counted. Blood was collected for analysis of hematology, blood chemistry and cortisol concentrations. Titers to common porcine respiratory viruses were measured in pigs from one plant. Hoof and pad problems did not differ overall between control and NANI pigs, however the percentage of severe foot problems was greater ($P<0.05$) in NANI compared with control pigs at plants A and E. The percentage of total ulcers, rhinitis, and empty stomachs differed ($P<0.05$) between control and NANI pigs at individual plants, but not overall. Blood hematology and chemistry differed ($P<0.05$) between NANI and control pigs. Cortisol concentrations did not differ between NANI and control pigs. Titers to swine influenza virus (SIV) H1N1 and H3N2 and porcine circovirus (PCV) were lower ($P<0.01$) among NANI compared with control pigs. However, more ($P<0.01$) NANI pigs were positive for SIV H1N1 and H3N2 compared with control pigs. Blood hematology, chemistry, and pathology indicate a large difference between NANI and controls pigs. No single health problem was higher among NANI pigs compared to plant-matched control pigs. Rather, several problems appear to contribute to pigs becoming NANI which may differ from one plant too another.

Keywords: Pigs; Transport; Health; Down; NANI

1. Introduction

Losses of pigs during or after transport are both welfare and economic concerns. Transport losses include animals that are dead on arrival at the packing plant, pigs that have difficulty in walking during unloading,

* Corresponding author. Tel.: +1 806 742 2805x255; fax: +1 806 742 4003.
E-mail address: Mhairi.sutherland@ttu.edu (M.A. Sutherland).

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Table 1
Feet and hoof problem scores, % of the group, and gender of non-ambulatory, non-injured (NANI) and control pigs from four different processing plants in the United States

Measure	Plant A		Plant B		Plant D		Plant E		Plant averages	
	NANI	Control	NANI	Control	NANI	Control	NANI	Control	NANI	Control
N	39	39	36	36	60	60	62	57	197	192
Hoof damage/injury										
No. score 1	24.0	33.0	21.0	10.0	21.0	25.0	24.0	21.0	22.5	22.3
No. score 2	3.0	0.0	2.0	11.0[a]	10.0	10.0	9.0	3.0	6.0	6.0
Total score	27.0	33.0	23.0	21.0	31.0	35.0	33.0	24.0	28.5	28.3
% hoof problems	69.2	84.6[a]	63.9	58.3	51.7	58.3	53.2	42.1	59.5	60.8
Pad damage/injury										
No. score 1	11.0	4.0	20.0	13.0	9.0	14.0	17.0	19.0	14.3	12.5
No. score 2	3.0	0.0	8.0	17.0	25.0	20.0	28.0	14.0	16.0	12.8
Total score	14.0	4.0	28.0	30.0	34.0	34.0	45.0	33.0	30.3	25.3
% Pad problems	35.9	10.3[a]	77.8	83.3	56.7	56.7	72.6	57.9	60.7	52.0
Total feet and leg injuries, %	105.1	94.9	141.7	141.7	108.3	115.0	125.8	100.0[a]	108.5	105.0
Severe foot problems, %	15.4	0.0[a]	27.8	77.8[a]	58.3	50.0	59.7	29.8[a]	37.5	38.5
Barrows, %			47.2	33.3	65.0	41.7[a]	37.1	47.4	49.8	40.8
Gilts, %			52.8	66.7	30.0	51.7[a]	62.9	50.9	48.6	56.4

[a] Measures for NANI pigs for each plant and overall differ significantly from controls at $P<0.05$.

commonly referred to as 'downers', 'fatigued', 'subjects', 'suspects', 'slows', or 'NANI (non-ambulatory, non-injured)' pigs (Ellis et al., 2003).

Currently, it is not known why some pigs die or go down during transport (Ellis et al., 2003). Speculation into the factors that affect the percentage of dead and NANI pigs during transport include genetics (Ellis et al., 2003), handling of pigs prior to and after transport (Peeters et al., 2004), the stress caused by mixing with conspecifics, exposure to a novel environment and health problems (Clark, 1979). Non-ambulatory, non-injured pigs can exhibit symptoms that are characteristic of an acute stress response, including open-mouth breathing, skin discoloration, and muscle tremors (Ellis et al., 2003).

Severe and diffuse pulmonary congestion and edema were found in 70% of necropsied market weight pigs dead on arrival after transport (Clark, 1979). However, health related causes of NANI pigs are largely unknown. Hematological and blood chemistry profiles in slaughter weight pigs have been correlated to pathological–anatomical lesions, inflammatory processes and abscesses (Odink et al., 1990; Smeets et al., 1990; Elbers et al.,

Table 2
Internal measure scores of non-ambulatory, non-injured (NANI) and control pigs from four different processing plants in the United States

Measure	Plant B		Plant C		Plant D		Plant E		Plant averages	
	NANI	Control	NANI	Control	NANI	Control	NANI	Control	NANI	Control
Internal measures										
N	29	29	15	15	32	31	48	50	124	125
% Stomachs empty	58.6	48.3	20.0	6.7[a]	15.6	6.5[a]	4.2	24.0[a]	24.6	21.3
Ulcers, score 1	6.0	3.0	1.0	1.0	9.0	1.0[a]	1.0	6.0	4.3	2.8
Ulcers, score 2	0.0	0.0	0.0	0.0	1.0	0.0	0.0	0.0	0.3	0.0
Ulcers, total score	6.0	3.0	1.0	1.0	10.0	1.0[a]	1.0	6.0	4.5	2.8
Total ulcers, %	20.7	10.3[a]	6.7	6.7	31.3	3.2[a]	2.1	12.0[a]	15.2	8.1
Rhinitis, score 1			4.0	5.0	4.0	8.0			4.0	6.5
Rhinitis, score 2			4.0	1.0	5.0	6.0			4.5	3.5
Rhinitis, score 3			2.0	2.0	2.0	5.0			2.0	3.5
Rhinitis, score 4			0.0	2.0	2.0	1.0			1.0	1.5
Rhinitis, total score			10.0	10.0	13.0	20.0			11.5	15.0
Average rhinitis score			66.7	66.7	40.6	64.5[a]			53.6	65.6
Total rhinitis, %			1.5	1.3	1.3	1.1			1.4	1.2
Liver, total score	9.0	0.0[a]	1.0	0.0	8.0	7.0	8.0	5.0	6.5	3.0
Total liver, %	31.0	0.0[a]	6.7	0.0[a]	25.0	22.6	16.7	10.0	19.8	8.1
% Lung consolidation	8.4	2.4	1.6	3.9	5.9	8.3	3.7	2.2	4.9	4.2

[a] Measures for NANI pigs for each plant and overall differ significantly from controls at $P<0.05$.

Table 3
Macrophage sub-population in bronchoalveolar fluid of non-ambulatory, non-injured (NANI) and control pigs from four different processing plants in the United States

Measure	Plant B		SE	Plant C		SE	Plant D		SE	Plant E		SE	*P*-value
	NANI	Control		NANI	Control		NANI	Control		NANI	Control		Trt*Plant
N	36	36		8	7		8	9		58	46		
Subpop.1, %	71.3	72.4	2.40	28.8	24.1	4.01	30.9	37.8	3.68	50.8	59.3	6.70	0.440
Subpop.2, %	22.3	22.6	2.03	38.5	29.9	3.40	35.1	27.7	3.11	27.5	27.3	5.67	0.297
Subpop.5, %	6.4	5.0	1.50	32.7	46.0[a]	2.51	34.0	34.6	2.30	22.0	13.0	4.19	0.002

SE=Pooled SE.
[a] Measures for NANI pigs for each plant and overall differ significantly from controls at $P<0.05$.

1991). Therefore, the objective of this study was to assess the health of NANI and control pigs by looking at a range of measures, including complete blood chemistry, anatomy, and pathology.

2. Materials and methods

Data were collected from NANI and control pigs at each of five plants (A, B, C, D and E) in the USA. The five different plants were located at different geographical locations in the lower to upper midwestern USA. Daily animal capacity at the plants ranged from about 10,000 to 20,000 pigs per day. Approximately 15–20% of all pigs in the USA are processed at the five plants used in the present study.

NANI pigs were tattooed in the stressor pen (the pen where NANI pigs are held prior to processing) for identification once they were on the processing line. Control pigs were selected on the processing line; once a NANI pig was observed on the processing line the next pig that came along was allocated as a control pig. All control pigs were ambulatory sound during unloading at the plant. At plants A, B, C, and D control and NANI pigs were not necessarily from the same truck load or farm, due to the processing regime at the plants. However, all pigs from plant E did originate from only one farm.

2.1. Blood analysis

Blood was collected from NANI ($n=110$) and control ($n=98$) pigs for analysis of hematology and blood chemistry at four plants (B, C, D and E) and analysis was performed by the Department of Veterinary Pathology, Iowa State University, Ames, IA. Blood was not collected at plant A due to limited resources at the time. Ten milliliters of whole blood were collected over EDTA and 10 mL were collected without anticoagulant for serum. Whole blood was analyzed using the ADVIA®120 hematology system (The Jackson Laboratory, Bar Harbor, ME) for total white blood cell (WBC) counts, red blood cell (RBC) counts, platelet, neutrophil, neutrophil band, lymphocyte, eosinophil, basophil, and monocytes counts, hemoglobin, hematocrit, mean corpuscular volume (MCV), mean corpuscular hemoglobin (MCH), mean corpuscular hemoglobin concentrations (MCHC), red blood cell distribution width (RDW), nucleated RBC, plasma protein, and fibrinogen concentrations. Serum samples were analyzed using the Roche/Hitachi 912 (Roche Diagnostics, Basel, Switzerland) for blood urea nitrogen (BUN), creatinine, glucose, total protein, albumin, aspartate aminotransferase (AST), creatine kinase (CK), alkaline phosphatase (Alk Phos), gamma-glutamyl transpeptidase (GGT), total bilirubin, and haemolytic index. At plant E (only), serum was also collected from NANI ($n=52$) and control ($n=46$) pigs to determine the viremic status of these pigs. Isolation and titers for porcine reproductive and respiratory syndrome (PRRS), swine influenza virus (SIV) sub-types H1N1 and H3N2, PCV II and *Mycoplasma hyopneumoniae* were measured using ELISA (Veterinary Diagnostic Laboratory, Iowa State University, Ames, IA).

At plants D and E, serum samples were assayed for cortisol using enzyme immunoassay kit (Assay designs, Ann Arbor, MI). Intra- and inter-assay CV were 4.1% and 2.7%, respectively.

2.2. Pathology

Internal organs of NANI ($n=124$) and control ($n=125$) pigs were inspected for pathology at four plants (B, C, D and E). Pathology of internal organs was not recorded at plant A due to limited resources at the time. The same veterinarian observed and scored the internal organs of pigs used in this study at each of the four plants. Stomachs were scored as empty, full, and presence of ulcers. Ulcers were scored as 0 (no signs of ulceration), 1 (minor) or 2 (severe). Livers were assessed for liver damage. Livers were scored as 0 (no signs of damage), 1 (minor) and 2 (severe). A zero to two scale was used to assess the severity of ulcers and liver damage as this was determined adequate to cover the range of pathologies observed in these animals and to make a distinction between healthy and diseased animals. Rhinitis was recorded in pigs processed at two of the plants (C and D). The presence of rhinitis was scored from 0 to 4; with 0 indicative of no rhinitis and 4 indicative of severe signs of rhinitis. Lungs were examined and the percent of total lung volume affected with consolidation was visually estimated.

2.3. Alveolar macrophage isolation

Pulmonary alveolar macrophages were collected by means of bonchoalveolar lavage (BAL) at four plants (B, C, D and E). Pulmonary alveolar macrophages were not collected at plant A due to limited resources at the time. Fifty milliliters of sterile

Table 4
Blood chemistry of non-ambulatory, non-injured (NANI) and control pigs averaged over four processing plants in the United States

Measure	NANI	Control	SE	*P*-value		
				Trt	Plant	Trt * Plant
N	110	98				
WBC, 10^3/μL	22.1	18.3	0.82	0.001	0.001	0.470
RBC, 10^6/μL	8.4	8.6	0.17	0.346	0.000	0.011
Hemoglobin, gm/dl	14.9	15.7	0.27	0.049	0.000	0.025
Hematocrit, %	50.1	52.3	1.03	0.126	0.000	0.002
MCV, fl	60.0	71.6	10.12	0.419	0.447	0.566
MCH, pg	17.9	18.3	0.20	0.227	0.864	0.931
MCHC, gm/dl	29.9	30.0	0.19	0.687	0.000	0.007
Platelets, 10^3/μL	176.6	201.2	15.32	0.263	0.000	0.169
Neutrophil, 10^3/μL	14.7	7.3	0.88	0.000	0.000	0.931
Band Neutrophil, 10^3/μL	0.3	0.1	0.06	0.029	0.000	0.032
Lymphocyte, 10^3/μL	6.6	10.0	0.53	0.000	0.527	0.156
N:L	3.0	0.8	0.28	0.000	0.033	0.168
Monocyte, 10^3/μL	0.5	0.4	0.07	0.418	0.031	0.178
Eosinophil, 10^3/μL	0.0	0.4	0.07	0.002	0.003	0.024
Basophils, 10^3/μL	0.0	0.0	0.01	0.044	0.879	0.972
RDW, %	18.0	17.7	0.19	0.152	0.000	0.027
Nucleated RBC	2.1	0.4	0.37	0.001	0.147	0.643
Plasma Protein, gm/dl	9.0	8.9	0.13	0.841	0.000	0.008
Fibrinogen, mg/dl	326.7	288.3	26.12	0.204	0.013	0.858
BUN, mg/dl	22.4	14.6	0.84	0.000	0.005	0.001
Creatinine, mg/dl	3.2	2.4	0.14	0.000	0.006	0.001
Glucose, mg/dl	117.8	131.1	6.52	0.152	0.000	0.015
Total protein, gm/dl	8.0	8.1	0.08	0.395	0.000	0.001
Albumin, gm/dl	4.5	4.8	0.07	0.006	0.000	0.317
AST, IU/L	689.0	201.9	60.23	0.000	0.000	0.656
CK, IU/L	4286.0	4075.6	558.35	0.791	0.000	0.207
ALK PHOS, IU/L	199.2	140.0	8.91	0.000	0.023	0.198
GGT, IU/L	40.8	35.2	1.76	0.025	0.003	0.013
Total Bilirubin, mg/dl	0.2	0.1	0.02	0.076	0.000	0.327
Hemolytic Indice	50.7	59.4	8.59	0.477	0.000	0.001

SE = Pooled SE.

phosphate buffered saline (PBS) was added to lungs and massaged, and then PBS-lavage fluid was removed. Lavage fluid was centrifuged at 460 × *g* for 15 min. Supernatant was removed and frozen for later analysis. The cell pellet was washed in media and cytospins were made, fixed, stained with Hema-3 staining system (Fisher Scientific, Houston, TX), and 100 cells per slide were visually counted under a light microscope. The different pulmonary alveolar macrophage sub-populations were characterized based on their morphology and staining pattern as previously described (Shellito and Kaltreider, 1984). Sub-populations 1 and 2, as well as 3 and 4, were combined as it was too difficult to differentiate between these sub-populations using light microscopy.

2.4. Feet analysis

Feet and legs of NANI ($n=197$) and control ($n=192$) pigs were examined for cracked hooves, swollen joints, or abscesses at all plants studied as an assessment of foot and leg health. The same person observed and scored the feet of all pigs used in this study. The hooves, pads and joints were inspected for lesions and the severity of the pathology was scored as 0 (no signs of damage), 1 (minor) and 2 (severe). A zero to two scale was used to assess foot and leg health as this was determined adequate to describe the range of feet and leg problems, furthermore the observer had limited time to make a more in depth inspection of the pigs feet and leg as the pigs passed on the line. Score 0: the pads were pink/white or normal, the hooves showed no cracks or chips, and the leg joints were normal with no swelling, puffiness or abrasions. Score 1: the pads showed a discolored "spot" less than 13 mm in diameter but no callused areas, or the hooves showed hairline cracks that extended from the bottom of the hoof but not to the hairline, and the joints were puffy but not abscessed or swollen. Score 2: the pads had large discolored spots (greater than 13 mm in diameter) or callused or swollen areas that extending over the pad, the hooves had large noticeable cracks wider and deeper than hairline that extend from the bottom of the hoof close to or to the hairline, hooves were broken or chipped, and/or the leg joints were abscessed or swollen and may have shown abrasions or skin breaks. All four feet were observed for feet and leg problems and the resulting score was the worst condition recorded for that particular pig. Gender was also recorded for NANI and control pigs.

2.5. Statistical analyses

A linear mixed-effects model using the MIXED procedure of SAS version 9.1.3 (SAS Inst., Inc., Cary, NC) was used to analyze blood hematology and chemistry, cortisol concentrations, macrophage sub-populations and virus titers. The main fixed effects were plant (five levels) and treatment (two levels). The interaction between plant and treatment were included. Chi-square analyses were used to analyze feet and internal organ pathology scores. Values were considered significant at $P<0.05$.

3. Results

Hoof and pad problems did not differ between control and NANI pigs, however there were differences between NANI and control pigs among the different plants (Table 1). NANI pigs had greater ($P<0.01$)

Table 5
Blood chemistry of non-ambulatory, non-injured (NANI) and control pigs from four different processing plants in the United States

	Plant B			Plant C			Plant D			Plant E			*P*-value
Measure	NANI	Control	SE	NANI	Control	SE	NANI	Control	SE	NANI	Control	SE	Trt * Plant
N	36	36		8	7		8	9		58	46		
WBC, $10^3/\mu L$	26.1	20.4	1.28	22.3	17.1	1.96	17.3	15.3	1.99	22.6	20.3	1.12	0.470
RBC, $10^6/\mu L$	9.1	8.6	0.27	7.6	8.1	0.41	9.0	9.4	0.42	7.7	8.4	0.24	0.107
Hemoglobin, gm/dl	16.4	15.8	0.43	13.6	14.3	0.64	16.1	17.3	0.65	13.5	15.3[a]	0.73	0.025
Hematocrit, %	57.0	52.2[a]	1.64	43.5	46.3	2.45	53.8	57.5	2.49	46.1	53.3[a]	1.40	0.002
MCV, fl	62.4	103.9	16.11	57.3	57.7	24.11	59.8	61.1	24.55	60.4	63.7	13.82	0.566
MCH, pg	18.0	18.5	0.32	17.9	17.9	0.47	18.0	18.4	0.48	17.8	18.4	0.27	0.931
MCHC, gm/dl	28.9	30.2[a]	0.31	31.2	31.1	0.46	30.0	30.0	0.47	29.6	28.8[a]	0.26	0.007
Platelets, $10^3/\mu L$	237.9	310.9	19.46	158.7	179.6	29.12	133.4	113.1	30.57	.	.	.	0.169
Neutrophil, $10^3/\mu L$	18.4	11.6	1.40	13.7	4.8	2.09	10.5	4.0	2.13	16.1	8.8	1.20	0.931
Band Neutrophil, $10^3/\mu L$	0.1	0.1	0.07	0.2	0.0[a]	0.11	0.7	0.3	0.11	.	.	.	0.032
Lymphocyte, $10^3/\mu L$	7.0	8.2	0.84	7.5	10.5	1.25	5.8	10.6	1.28	6.2	10.8	0.72	0.156
N:L	3.2	1.6	0.45	2.3	0.5	0.68	2.3	0.4	0.69	4.3	0.9	0.39	0.168
Monocyte, $10^3/\mu L$	0.7	0.3[a]	0.11	0.8	0.7	0.16	0.4	0.2	0.16	0.3	0.5[a]	0.09	0.178
Eosinophil, $10^3/\mu L$	0.0	0.2	0.11	0.1	1.0	0.17	0.0	0.2[a]	0.17	0.0	0.1	0.10	0.024
Basophils, $10^3/\mu L$	0.0	0.0	0.02	0.0	0.1	0.03	0.0	0.0	0.03	0.0	0.0	0.02	0.972
RDW, %	19.2	18.1[a]	0.30	16.7	16.9	0.45	18.3	17.2	0.46	18.1	18.5	0.26	0.027
Nucleated RBC	0.9	0.1	0.53	2.5	0.3	0.80	3.6	1.0	1.04	1.5	0.1	0.46	0.643
Plasma Protein, gm/dl	9.7	9.0[a]	0.21	7.6	8.6	0.31	9.5	9.0[a]	0.34	9.0	9.1	0.18	0.008
Fibrinogen, mg/dl	286.7	342.9	40.52	233.3	157.1	60.63	312.5	500.0	65.82	286.7	340.7	34.75	0.858
BUN, mg/dl	20.8	13.3[a]	1.02	17.9	14.0[a]	2.24	29.9	13.6	2.10	21.0	17.7[a]	0.87	0.001
Creatinine, mg/dl	3.6	2.2[a]	0.17	2.8	2.1	0.37	3.7	3.1	0.35	2.6	2.5	0.14	0.001
Glucose, mg/dl	96.4	100.9	7.92	133.1	94.9[a]	17.38	153.1	214.1	16.32	88.5	114.4[a]	6.90	0.015
Total protein, gm/dl	8.1	7.9	0.10	7.5	8.4	0.22	8.7	8.2[a]	0.21	7.5	7.8[a]	0.09	0.001
Albumin, gm/dl	4.8	4.9	0.08	4.0	4.4	0.18	4.7	4.9	0.17	4.5	4.8	0.07	0.317
AST, IU/L	555.7	82.6	73.30	359.8	70.6	160.87	1206.3	570.1	151.05	634.4	84.4	62.63	0.656
CK, IU/L	4061.0	4790.0	853.35	4426.0	2800.4	1095.02	780.5	2495.0	1619.41	7876.5	6217.0	270.17	0.207
ALK PHOS, IU/L	215.7	152.2	10.84	160.0	96.3	23.79	228.5	146.7	22.33	192.7	164.7	9.26	0.198
GGT, IU/L	39.8	41.4	2.14	36.3	28.0	4.70[a]	44.8	26.6	4.41	42.4	44.8	1.83	0.013
Total Bilirubin, mg/dl	0.2	0.1	0.02	0.1	0.1	0.05	0.2	0.2	0.05	0.1	0.0	0.02	0.327
Hemolytic Indice	21.1	4.8	10.46	59.5	6.1	22.95	93.5	200.4	21.55	28.6	26.0	8.93	0.001

SE = Pooled SE.
[a] Measures for NANI pigs for each plant and overall differ significantly from controls at $P<0.05$.

percent of pad problems compared with control pigs at plant A. The percentage of total feet and leg injuries was greater ($P<0.05$) in NANI compared with control pigs at plant E. Conversely, the percentage of hoof problems was less ($P<0.01$) among NANI than control pigs at plant A and the number of hoof problems with a score of 2 was lower ($P<0.01$) in NANI compared with control pigs at plant B. The percentage of severe hoof and pad problems were greater ($P<0.01$) in NANI compared with control pigs at plant A and E. Conversely, severe foot and pad problems were less ($P<0.01$) among NANI than control pigs at plant B.

Gender had an impact on the percent of NANI pigs at one plant (Table 1). At plant D, a higher ($P<0.05$) percentage of barrows were NANI than were gilts.

Internal organs were inspected for gross signs of disease. Overall, signs of disease did not differ between NANI and control pigs, however there were differences in pathology scores for different organs between NANI and control pigs within the plants (Table 2). The incidence of ulcers was greater ($P<0.05$) in NANI pigs compared with controls at plants B and D; however, at plant E, control pigs displayed a greater ($P<0.01$) percentage of ulcers than NANI pigs. Rhinitis scores were measured in two of the five plants; at plant D, the average rhinitis score was greater ($P<0.01$) among control than NANI pigs, but no differences were observed at plant C. At plants B and C the total percentage of liver problems was greater ($P<0.05$) among NANI than control pigs. The percentage of empty stomachs was greater ($P<0.05$) among NANI compared with control pigs at plants C and D. Conversely, at plant E the percentage of empty stomachs was greater ($P<0.01$) among control than NANI pigs. Lung consolidation was not different between NANI and control pigs at any of the plants.

Table 6
Virus isolation and titers in serum of non-ambulatory, non-injured (NANI) and control pigs from one processing plant

Measures	NANI	Control	*P*-value
N	52	46	
Titers			
Porcine reproductive and respiratory syndrome	1.355	1.368	
Mycoplasma hyopneumoniae	0.415	0.402	
Swine influenza sub-types H1N1	0.410	0.650	**0.01**
Swine influenza sub-types H3N2	0.388	0.604	**0.01**
Porcine circovirus II	6.203	10.819	**0.001**
% Positive viremia			
Porcine reproductive and respiratory syndrome	88.5	93.5	
Mycoplasma hyopneumoniae	40.4	47.8	
Swine influenza sub-types H1N1	53.8	34.8	**0.01**
Swine influenza sub-types H3N2	51.9	26.1	**0.01**
Porcine circovirus II	100.0	100.0	

Overall, alveolar macrophage sub-populations did not differ between NANI and control pigs (Table 3). However at plant C, alveolar macrophage sub-population 5 was greater ($P<0.001$) among control than NANI pigs.

Blood chemistry differed between NANI and control pigs (Table 4). White blood cells counts, the percentage of neutrophils and basophils, the neutrophil to lymphocyte ratio, nucleated red blood cells, and AST and Alk Phos concentrations were greater ($P<0.05$) among NANI than control pigs (Table 4). Conversely, the percentage of lymphocytes and the concentration of albumin were less ($P<0.05$) among NANI pigs than controls (Table 4). Gamma-Glutamyl Transpeptidase, creatinine, BUN, RDW, and neutrophil bands were greater ($P<0.05$) among NANI compared to control pigs at one or more of the processing plants (Table 5). Conversely, total protein, Hg, glucose, eosinophils, and the hemolytic index were lower ($P<0.05$) among NANI pigs compared with their controls, in one or more of the processing plants (Table 5). Cortisol concentrations did not differ between NANI (80.0 ± 1.83) and control (80.5 ± 1.87) pigs.

Virus titers were measured in the serum of NANI and control pigs at plant E only (Table 6). Titers to SIV sub-types H1N1 and H3N2 and PCV II were less ($P<0.01$) among NANI compared with control pigs. However, more NANI pigs were positive for SIV sub-types H1N1 and H3N2 compared with control pigs ($P<0.01$).

4. Discussion

Hoof and pad problems did not differ between control and NANI pigs, however there were differences between NANI and control pigs' feet among the different plants. Despite the fact that there was no overall difference in feet and hoof problems between NANI and control pigs, over 50% of the pigs had hoof problems or pad problems of some kind and over 30% of these problems were severe. Therefore, it is apparent that hoof and pad problems in slaughter weight pigs are a problem and a welfare concern that needs to be addressed even though it does not seem to directly impact the occurrence of NANI pigs, except in certain situations (ex., Plant A and E).

A higher percentage of barrows were identified as NANI compared with gilts, in one of the plants studied. The gender of pigs being transported in trailers to the processing plant has been shown to significantly affect the percentage of NANI pigs during transport (unpublished data from this lab). The literature regarding the effect of gender on transport loss is limited. One possibility is that barrows may fight more than gilts during transport. Transporting of pigs usually involves the mixing of unfamiliar pigs, which often results in fighting to establish new dominance orders (McGlone, 1985). A British survey on transport of finishing pigs found that two thirds of pigs dead on arrival had been involved in fights (Sains, 1980). Fighting in pigs can cause stress, possibly resulting in fatigue (Warriss, 1995). Therefore, fighting of pigs during transport could possibly result in a higher incidence of NANI pigs. However, the frequency of aggressive behavior after mixing of young pigs did not differ between young gilts and castrated-males (McGlone, 1985). Fighting during transport could result in pigs becoming fatigued and consequently going down, but it is unlikely that this explains the gender effect on the incidence of NANI pigs. Therefore, more research is needed in this area to answer this question.

Low energy levels among pigs have been suggested as a possible cause of pigs becoming NANI during or after transport. However, in the present study less than 30% of NANI pigs had empty stomachs (or 70% had feed in their stomachs) and this was similar among control pigs. Blood glucose goes down with food deprivation (Bertol et al., 2005), but in the present study glucose concentrations were within the normal range for both NANI and control pigs (Carr, 1998; Mersmann and Pond, 2001). The presence of food in the stomach of most NANI pigs in combination with average blood glucose concentrations measured in NANI pigs make it unlikely that NANI pigs went down due to fatigue caused by low energy stores, however measurement of muscle glycogen levels in future studies may give a better indication of an animals energy reserves.

Pathology of internal organs was recorded to determine if disease was a potential cause for pigs becoming

NANI. Overall, there were no differences in the pathology of the liver, stomach, or lungs between NANI and control pigs, but there were differences between NANI and control pigs at particular plants. Therefore, pigs do not appear to go down due to a single disease. Rather, at one plant, pigs becoming NANI may be associated with ascarid infection, another may have an active (but not a resolved) respiratory disease, and another may have feet and leg problems (or other health problems).

Cortisol concentrations were measured in NANI and control pigs at two of the five plants. Cortisol concentrations did not differ between NANI and control pigs, however cortisol concentrations were elevated in all pigs compared with baseline cortisol concentrations of age matched non-stressed pigs (unpublished data from this lab), suggesting that all pigs were experiencing stress prior to harvesting. Measuring cortisol at one time point as an indicator of stress is not optimal. It would have been preferable to compare the cortisol response to transport in control vs. NANI pigs, however this was beyond the scope of this study. Hematology measures differed significantly between NANI and control pigs. The neutrophil to lymphocyte ratio was significantly higher in NANI pigs than controls. Acute 4 h transport stress has been shown to increase the neutrophil to lymphocyte ratio in pigs McGlone et al., 1993), hence the high cortisol concentrations in control and NANI pigs suggest that all pigs are stressed at harvesting but the increase in the neutrophil to lymphocyte ratio measured in NANI pigs may be an indication that these pigs are experiencing even more stress than controls.

The percentage of lymphocytes were reduced in NANI compared with control pigs. Transient leukopenia and lymphopenia are often induced in pigs that have been infected with the PRRS virus, but lymphocyte numbers return to normal within eight to 14 days post-inoculation (Nielsen and Bøtner, 1997; Toepfer-Berg et al., 2004; Sutherland et al., 2007). Non-ambulatory, non-injured pigs did not have a greater percentage of pigs positive for PRRS compared with control pigs at plant E. However, reduced lymphocytes in NANI pigs in the present study may suggest that these animals are experiencing an active infection. For example, NANI pigs may have been infected with the PRRS virus less than eight days prior to being shipped to the processing plant. At plant E, serum titers to common pig respiratory viruses were measured. Titers to one or more respiratory viruses were measured in 100% of the pigs, in both NANI and control pigs. However, it was not determined if these titers were formed in response to an active infection or from a past infection. NANI pigs had significantly lower titers to SIV sub-types H1N1 and H3N2 and PCV II compared with control pigs, but a higher percentage of NANI pigs were positive for SIV sub-types H1N1 and H3N2 compared with control pigs. It is unclear why NANI pigs would have lower viral titers compared with controls, but one possibility is that NANI pigs may be immunosuppressed for whatever reason. The combination of leucopenia, positive titers to various respiratory viruses and lower viral titers compared with control pigs are indications that the health of these pigs is compromised.

Inflammatory processes are characterized by increased leukocyte counts, fibrinogen and total protein concentrations, and reduced hematocrit, Hg, and albumin (Odink et al., 1990). In the present study, leukocytes were increased and Hg and albumin concentrations were reduced among NANI pigs, suggesting that these pigs may have been experiencing some form of inflammatory response. Albumin concentrations have also been shown to be reduced in pigs with abscesses (Smeets et al., 1990; Elber et al., 1992). Changes in leukocyte percentages and albumin concentrations in NANI pigs suggest that these pigs were experiencing some sort of active infection whether due to viral infection or inflammation which may be a contributing factor for them going down during transport.

Blood chemistry measures were significantly different between NANI and control pigs in the present study. Creatine kinase is released from muscle fibers in response to intense muscle exertion or tissue damage. Values of CK measured in this study were in the upper limit of the normal range for CK (Carr, 1998) for both NANI and control pigs. Creatine kinase concentrations were reported to increase in market weight pigs during transport to the packing plant (Elbers et al., 1991) and in pigs kept at stocking densities lower than 0.5 m^2/100 kg during transport (Barton-Gade and Christensen, 1998; Warriss, 1998). Therefore, elevated CK concentrations measured in NANI and control pigs was probably due to tissue damage caused by muscle exertion as a result of transport to the processing plant rather than a causative factor in NANI pigs going down during transport.

Creatinine is a waste product produced when muscle cells are broken down. Blood urea nitrogen is a waste product in the blood caused from the breakdown of protein. Creatinine and BUN can also be indicators of kidney dysfunction. In the present study, creatinine concentrations in pigs were above the normal range (Carr, 1998; Mersmann and Pond, 2001) and higher among NANI than control pigs. The high creatinine and BUN concentrations among NANI pigs may reflect possible kidney dysfunction in these animals, which could possibly lead to these pigs becoming NANI during transport. Alternatively, the higher creatinine and

BUN may indicate that NANI pigs have more muscle and protein break down than control pigs.

Aspartate aminotransferase is a hepatic enzyme released in the blood when certain organs or tissues, particularly the heart or liver, are injured. Alkaline phosphatase is an enzyme present within the liver, bone, kidneys, and intestines and leaks into the blood when cells from these organs are destroyed. Increased AST and Alk Phos concentrations are an indicator of liver damage, or an indicator of bone damage. Aspartate aminotransferase and Alk Phos were higher among NANI than control pigs in the present study. Furthermore, the presence of liver problems were greater among NANI pigs than control pigs at two of the processing plants. Increased concentrations of these two enzymes in NANI pigs in combination with liver damage possibly associated with ascarid infection indicate that these animals may have liver damage. Increased AST and Alk Phos concentrations in NANI pigs, may also be explained by NANI pigs having slight bone injuries or fractions. Fractures were recorded in 26% of market weight pigs which died during transport in Canada (Clark, 1979). The elevated AST and Alk Phos are consistent with NANI pigs having a hairline fracture, or a bruised bone (but not a compound fracture, which would be obvious and classified as a non-ambulatory injured pig). Increased AST and Alk Phos concentrations in NANI pigs suggest that these pigs have liver problems, slight bone injuries or both which could result in these pigs going down during transport.

Total protein and albumin concentrations are markers for protein homeostasis, which increase with dehydration. Albumin concentrations usually parallel the total protein concentrations. Total protein was high, but still within the normal range for growing pigs, but albumin was slightly above the normal range (Carr, 1998; Mersmann and Pond, 2001). Furthermore, total protein was higher in control pigs at two plants and albumin was higher in control pigs overall, suggesting that dehydration was not a causative factor of NANI pigs in the present study.

Blood chemistry analyses and pathology indicate large differences between NANI and controls pigs. Severe energy loss as measured by blood glucose and stomach content was not a cause of pigs becoming NANI. The present study did not find one determining factor for the cause of NANI pigs. Pigs probably become NANI due to one or a combination of factors. Non-ambulatory, non-injured pigs generally had one or more of the following conditions: feet and leg problems, an active infection, ulcers, liver damage, subtle bone injury, and were in a catabolic state.

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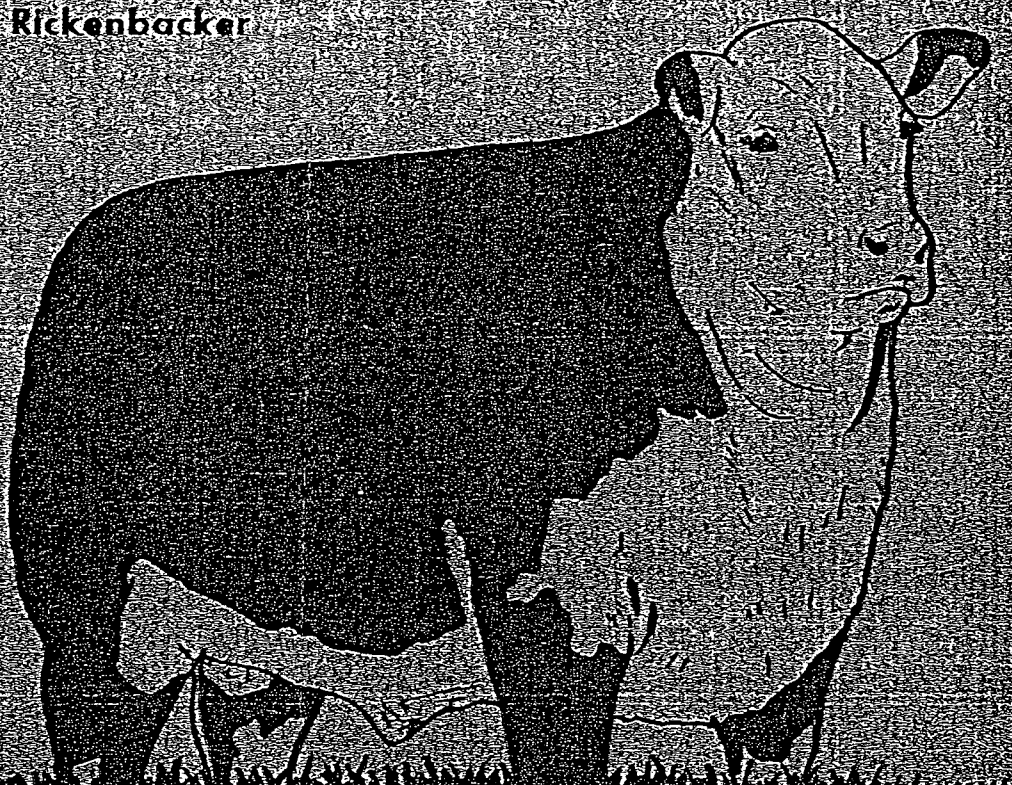
ATTACHMENT 5

Marketing Research Report 346
August 1959

Handling Conditions and Practices Causing Bruises in Cattle

by Joseph E. Rickenbacker



Farmer Cooperative Service ○ U. S. Department of Agriculture

Attachment 20

Summary

Bruise injury has been a major prob-
n for the livestock and meat industry
many years. Carcass bruises, par-
ularly in cattle, represent one of the
jor loss areas in the industry. This
s has been estimated as being substan-
ly higher than that from crippling and
th in transit. On the basis of results
ained in the tests made as a part of
s study, the national loss on cattle
m carcass bruise damage is probably
und $12 million a year.

It is difficult to say precisely who
rs this loss because of the complexi-
s of livestock marketing and processed
at merchandising. Each segment of the
ustry—producer, transporter, market
ency, packer, and even the consumer—
rs the loss in whole or in part at one
e or another.

A major obstacle to effective loss
trol and reduction has been this ina-
ity to fix the responsibility for bruise
ury. Cattle pass through many hands
ing marketing and processing and
cass damage is generally not dis-
nible until after slaughter. Thus,
e, place, and cause of damage have
n sufficiently indefinite as to permit
ost any handler of the cattle to deny,
at least question, any part of his re-
nsibility for the loss.

Because farmers and their livestock
rketing agencies are so vitally con-
ned with this loss area, Farmer Co-
rative Service began a study of the
ise loss problem in 1954. Arrange-
nts were made with the Ohio State University and the Ohio Agricultural Experiment Station to develop a means of helping fix the responsibility for bruise damage.

Although this study did not definitely fix responsibility for bruise loss, laboratory research produced much valuable information useful in considering the problem of cattle bruises: For instance, animals may be bruised at any time up until the blood pressure approaches zero—even after stunning. Carcass location, degree of impact, and the emotional state of the animal have an influence on bruise injury. Animals, somewhat like human beings, have varying degrees of "susceptibility" to bruising. This may sometimes be explained or influenced by previous bruising or by introducing compounds into the system to retard bruises.

To more positively establish the cause of these bruises, Farmer Cooperative Service initiated research under conditions generally prevailing in the marketing and processing of cattle. We assumed that certain practices and conditions involved in handling the cattle could be related to carcass damage from bruising.

This assumption, in turn, was based on the premise that some bumps cause bruises. During the handling and processing, bumps frequently happened. Previous investigations by Farmer Cooperative Service, in cooperation with Livestock Conservation, Inc., indicated that bumps were likely to cause bruises.

In this study researchers tabulated bumps on test lots of cattle from loading through slaughter on the basis of individual cattle by carcass location and handling phase. These data were then checked against a record of actual carcass bruise damage obtained after the test animals were slaughtered.

Thirteen tests were conducted in the Midwest and Rocky Mountain areas during 1958, involving a total of 720 head of cattle of various weight, sex, and grade. The animals were slaughtered at five different packinghouses. The total bruise loss on the cattle used in the tests amounted to $60.40 per 100 head. About one-third represented loss due to tissue trim itself and the balance was attributed to devaluation of the side because of excessive trim.

Largest losses were in the hip or loin area, both on the basis of trim weight and financial loss. Shoulders accounted for the second highest loss area.

The bruise loss on steers was approximately three times that suffered on heifers. Likewise, higher grade cattle suffered less carcass bruise damage than did plainer grades.

The largest number of bruises occurred after the animals were in the packers' hands; that is, during the movement from packer holding pens through slaughter. Although about three times as many bruises were identified with this slaughter phase, the financial loss was almost twice as large as that attributed to other handling phases. This result indicated that severity of bruise injury was greater during loading, loading, and the like.

These tests pointed clearly to ce causes of carcass injury that could did occur in all handling phases. Th were (1) animal characteristics; (2) fa ities involved in transporting and hand animals; (3) handling techniques; (4) tions and attitudes of personnel actu moving or handling the cattle; and (5) miscellaneous factors as weather con ditions, length-of-haul, and the like. C tain of these were of greater import during one handling phase than other

No single segment of the industry be saddled with full responsibility bruise loss. Rather, bruise loss is industrywide problem. There was no tive proof that livestock could be mo safely and without injury, since 30 per cent of the test animals went thro unscathed.

We believe two approaches are lik to yield worthwhile results in coping with the bruise problem. Adopting safe simple facilities would enable handlers to make full use of the most appropriate handling techniques. Promoting safe handling programs would alert handlers to the close relationship of their attitudes and actions to bruise loss.

Although somewhat remote at moment, some relief may develop in products which can be administered cattle economically and easily to raise the native bruise resistance of the animal. Some steps have been taken to initiate research programs to bring this about.

Handling Conditions and Practices Causing Bruises in Cattle

by
Joseph E. Rickenbacker
Transportation Branch
Management Services Division

The livestock industry loses millions dollars each year from loss and dam e to meat animals during marketing d processing. Some of these losses e obvious, such as dead or crippled imals arriving at a public market or processing plant. Others might be ore properly termed concealed losses— uise injury, shrink and disease, and rather intangible one generally re rred to in the trade as "loss of market oom."

Many of these losses, if not all of em, may be in whole or part closely sociated with transportation. This is rticularly true if we think of trans rtation as including all handling from e time the animals are first sorted for pment, through all the various stages marketing, until the animal is actu y slaughtered at the processing plant.

However, the loss may also be caused a condition which occurred before the nsportation phase. For example, an mal in a weak or emaciated condition y die during the trip. In a sense this loss would be a transportation loss but the real blame belongs to the producer.

To consider these problems of livestock losses in transit, Farmer Cooperative Service began a research project in 1954. This survey indicated that the total economic loss due to death and crippling was approximately $8 million a year at average annual prices for 1955 and 1956.[1] In general, dead and cripple losses among animals hauled by motortruck exceeded those among animals moved by railroad, often by substantial margins.

During 1956, FCS conducted a special truck survey at 8 major public markets of some 6,400 loads of live animals observed during unloading. This survey revealed definite "loss associated conditions" which occurred in vehicles containing dead and crippled animals, or both. These loss associated conditions included such things as obvious overcrowding, improper bedding, inadequate or improper ventilation, excessive use of persuaders and failure to use partitions where needed.[2]

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kenbacker, Joseph E. Losses of Livestock in Transit in Midwestern and Western States. Mar. Res. t. No. 247. Farmer Cooperative Service, U. S. Dept. of Agr. June 1958.
kenbacker, Joseph E. Causes of Losses in Trucking Livestock. Mar. Res. Rpt. No. 251, Farmer Cooperative Service, U. S. Dept. of Agr. June 1958.

The problem of bruise loss has been of even greater significance than dead and cripple losses and extremely vexatious to the industry.

Because bruise damage is usually not discernible until after the animal is slaughtered and the hide removed, it has always been extremely difficult to fix responsibility for the bruise. This situation prevented setting up programs to curtail these losses.

There has also been a great deal of controversy over the question of who pays for the cost of the bruise. Complexities of livestock marketing have made it impossible to give a specific answer. At one time or another, each segment of the industry—the farmer, the transportation agency, the market agency, the packer, and even the consumer—has stood the loss, in whole or in part. Certainly each recognized that the losses did occur and that somebody paid for them.

To reduce bruise losses, FCS felt the most effective way would be to develop some method of positively determining the responsibility for the damage. Then educational programs could be instituted which might result in improving conditions to the point that such losses could be minimized.

We decided the only practical means of determining bruise responsibility would be through a study of the bruise itself. After consulting with various research agencies, we concluded that determining the "age of a bruise" could lead to the person or agency responsible for it.

For example, if the age of the bruise could be set at 24 hours, and the animal had been on a truck en route to market 24 hours before slaughter, the bruise would have been caused by something that happened in the motor vehicle. The trucker would then be responsible for the loss.

FCS approached this problem of bruise loss on two fronts: (1) through experimental research under laboratory controlled conditions; and (2) special research under ordinary conditions prevailing during the marketing and processing of cattle.

Research to determine the age of bruised tissue was begun in 1954 by the Ohio State University and the Ohio Agricultural Experiment Station, under contract with Farmer Cooperative Service.

Researchers found that they were entering a virtually uncharted field. Not only had there been no work done on livestock bruises but very little was known about human bruises.

These researchers conducted experiments under strict laboratory controlled conditions and used selected lots of animals.

Their research developed many significant findings.

They learned a great deal about the structure of a bruise. Now one can estimate in a general way the approximate age of bruised tissue by closely examining the color of the tissue itself as well as the appearance externally on a living animal.

Unfortunately, the researchers were unable to develop a simple test which could precisely determine the age of a given bruised tissue. But two tests were developed, one based on color changes in the bruised tissue, and another based on the conductivity of the tissue. These tests are able to establish age of bruised tissue in rather broad categories, such as less than 60 hours old, 60 to 72 hours old, 3 to 4 days, 4 to 8 days old, and over 8 days old. These categories have limited use in fixing responsibility for bruise loss because most cattle are moved to market one day, sold the next and slaughtered on the third day.

Findings disclosed animals may suffer bruise injury at any time up until the blood pressure falls to approximately zero. This means that the carcass can be bruised after stunning at a slaughter house.

Animals of the same type and grade had varying degrees of susceptibility to bruise. This susceptibility was influenced by different factors. For example, an animal that had suffered a previous bruise was not as susceptible to a second bruise, and, if he suffered a second and then a third, the third bruise was likely to be less severe and to heal more rapidly than the second. The location on the carcass and the relative force of impact greatly influenced both the extent and severity of bruise damage.

Emotional state of the animal also exerted a very strong influence on susceptibility to bruise damage. Animals highly excited and nervous bruised more easily than those who were in a more calm or normal "frame of mind."

All of these findings were tremendously important from a scientific standpoint alone, but more importantly, they pointed to ways of reducing bruise loss.

The laboratory work and the findings set the stage for the work undertaken in this report involving ordinary marketing and processing of cattle.[2]

Bruise Test for Cattle Under Ordinary Market Conditions[1]

In the ordinary marketing and processing of livestock, cattle pass through many hands. This was a complicating factor in designing a test for use under these conditions. The problem was met by limiting the test animals to cattle already owned by the packing concern before movement to slaughter, or "directs" as they are called. The use of such directs not only reduced the number of hands through which test cattle passed but also eliminated the possibility of losing test shipments by having them sold for disposition off the market or to non-cooperating packers.

Since climate considerations are not as important in the case of cattle as in other species of livestock, it was not necessary to spread the tests over the various seasons of the year. The number of test lots, however, provided a sample that covered the various classes and grades of cattle. The tests were

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[1] For reports on certain aspects of the research done at Ohio State University, refer to the following articles and publications:

Hamdy, Deatherage, and Shinowara. Bruise Tissue. I. Biochemical Changes Resulting From Blunt Injury. Proc. of the Soc. of Exptl. Biol. and Med. 95:255-258, 1957.

Hamdy, Kunkle, Rhetts and Deatherage. Bruise Tissue. II. Determination of the Age of a Bruise. Jour. of Animal Sc. Vol. 16, No. 2. May 1957.

Rickenbacker, Joseph E. Biochemical Problems in Determining the Age of Bruised Animal Tissue. Serv. Pt. 42. Farmer Cooperative Service, U. S. Dept. of Agr. 1959.

An expanded discussion of the methodology and philosophy of this test is included in the appendix. A detailed description of an actual test, illustrating all the techniques and procedures used, also appears in the appendix.

conducted at a sufficient number of plants and loading points to allow for variations in facilities.

We designed the test to relate potential injury causing factors—bumps between two animals or into objects—to carcass bruise damage. Hence, the popular name for the test—a "bump-bruise" test.

Observation of test animals covered the time from the beginning of loading into the truck for transport on through slaughter. Although this arrangement did not take into account any conditions which may have existed before loading time, it was the only practical period for observation. The use of stanchion-fed animals would have met this shortcoming but here we would have been falling back on laboratory-like conditions. Instead, we selected test lots that had been onfeed for a minimum of 60 days before shipment, which entailed minimum preshipment handling and bruising.

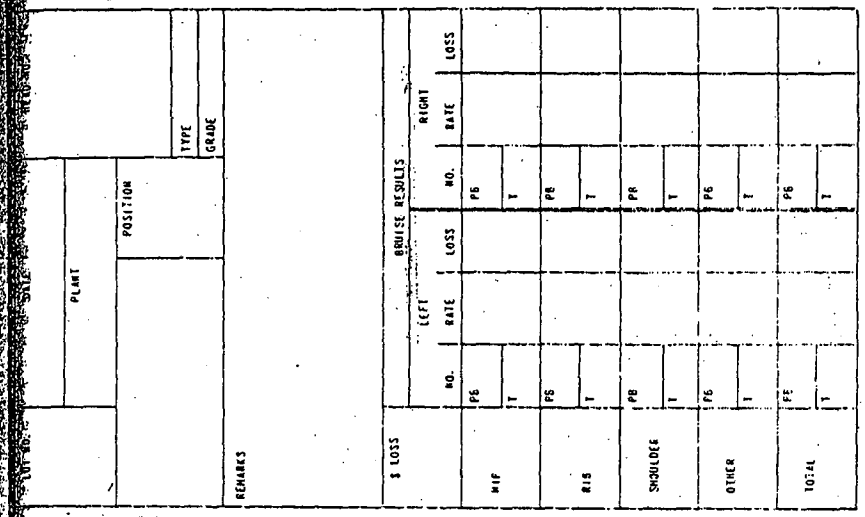
To facilitate the association of potential bruise injury with specific handling incidents, we broke the observation period into specific handling phases. These phases, largely self-explanatory, were: loading, in transit (over-the-road haul), unloading, yarding, and slaughter. Slaughter is better considered as a two-part phase, one part involving movement to the knocking box and thereafter up to sticking.

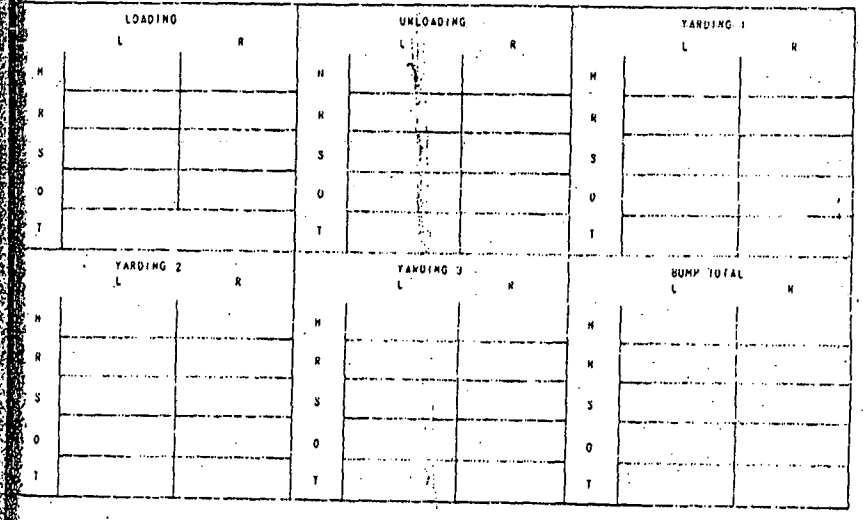
We further insured identification by recording the potential bruise injuries by carcass location—right or left side and by general body area—hip, rib, shoulder, and the like. Each animal in the test lot was individually identified by a number applied to the hip area before loading. After slaughter, the carcass carried the same number on a metal tag placed in the brisket. This tag remained there until the carcass was read for shipment.

Observers recorded the potential injuries. These observers stationed themselves at points best suited for keeping the cattle under close scrutiny during each handling phase. They used portable tape recorders since this allowed for instantaneous recording of observations. The tapes were subsequently transcribed on individual cards for each animal (Figure 1).

After slaughter, the observers recorded all bruise injuries by individual animal on the basis of carcass location. After each trim-out of tissue was weighed, the observers noted various body marks likely to have been caused by impact. They rechecked the carcass

These sides of beef illustrate what [illegible] when cattle sustain severe bumps during [illegible] dling. Not only is the trimout loss [illegible] whole side must be reduced in price before [illegible] can be sold.





after 24 hours in the packinghouse cooler. At this time, they obtained carcass weight and the packer grade which is more detailed than the standard USDA terminology.

In addition, the packer estimated carcass devaluation, if any, for recording at this time. This devaluation was applied to those sides sufficiently damaged by bruising as to make it necessary for the entire side of beef to be reduced in price in order to market it. Thus, such sides represented a "double loss"—trim loss (the value of bruised tissue trimmed-out) and devaluation loss (a reduction in value of the whole side due to bruise damage). The devaluation loss was usually stated in fractions of a cent per pound, ranging from one-half cent to 3-1/2 cents. All information obtained during the two post-slaughter checks was on the individual animal's record.

The record of potential bruise-causing incidents obtained during the observation periods included all that happened to each animal which might have resulted in carcass injury. The post-slaughter records gave a complete picture of bruises, trim and loss. By correlating the two sets of records, we determined the relationship of potential bruise-causing incidents to actual carcass and monetary loss.

Bruise Losses

The Farmer Cooperative Service survey consisted of a series of 13 tests covering 720 cattle. The test described in the appendix, page 78, was one. The test animals were slaughtered at five different packing plants operated by four different companies. In five of the tests, the animals were delivered directly to the packer at his own plant, while in the remaining tests the animals were unloaded at a public stockyard and subsequently delivered to the packer. (This is not to imply that the test animals received at the public stockyards went through the same "yarding" as animals normally offered for sale at a public market would go through).

In all instances, a for-hire trucker moved the animals, except for two tests where the feed lot operator drove the trucks. In each test the animals were transported from ranch or feedlot to the packer on one day, slaughtered the next, and the cooler check made the third day.

The data obtained during the various tests were tabulated and analyzed on several different bases. These included: (1) carcass location; (2) whether steer or heifer; (3) by individual test; (4) by grade—choice, good or standard (steers and heifers tabulated separately, as well as combined into an "all cattle" classification); and (5) by handling phase on the basis of carcass location. For the sake of uniformity, as well as easy comparison, all results were tabulated on the basis of theoretical 100-head lots.

Location on Carcass

Table 1 provides a summary on a 100-head-lot basis of general bruise information obtained in all 13 of the tests. It shows the number of trim bruises and the number of fire bruises (inflamed or bloodened spots on the fatty surfaces of the carcass which are not trimmed), the pounds of trim tissue and the value of the trim, the devaluation loss, and the total financial loss on the basis of the carcass locations used in the reporting system. These locations were the hip, rib, shoulder, and the general category "other."

Table 1.—*Bruise loss per 100 head by carcass location*

Carcass location	Number "trim" bruises	Number "fire" bruises	Pounds trim tissue	Financial trim loss	Devaluation loss	Total financial loss
Hip	25	26	16.9	$11.54	$21.32	$32.86
Rib	10	7	4.8	2.37	2.33	4.70
Shoulder	29	39	13.2	5.27	4.29	9.56
"Other"	16	21	7.0	3.18	10.10[1]	13.28
Whole carcass	80	93	41.9	22.36	38.04	60.40

[1] Includes sides devalued because of multiple minor bruises over the carcass, "fiery" appearance, and general carcass condition due to bruising.

Without regard to actual carcass location, overall bruise loss amounted to $60.40 per 100 head. This figure represents $22.36 trim loss and $38.04 devaluation loss. The trim loss was due to 41.9 pounds of trim tissue taken from 80 carcass bruises. There were 93 fire bruises.

Although $60.40 per hundred head may seem a small figure, it nonetheless represents a significant loss to whatever segment of the industry has to bear it. If we assumed that was an average loss and projected it for total annual slaughter in the United States, the loss due to carcass bruise injury in 1957 would be in the neighborhood of $12 million—a rather substantial figure.

Without giving any consideration to financial loss, the hip and shoulder areas of the cattle appeared the most frequently bruised or injured portions. Between them, they accounted for about 68 percent of the total number of trim bruises, with the shoulder receiving a slightly larger number of such bruises than did the hip. Likewise, these two carcass locations accounted for the majority of fire bruises—about 70 percent. With this type bruise, however, the ratio of shoulder fire bruises to hip fire bruises was 3 to 2.

The rib area sustained only about 12 percent of the trim bruises and 7-1/2 percent of the fire bruises.

Weight of tissue removed from the trim bruises was likewise largely concentrated in the hip and shoulder areas—about 72 percent. But while the shoulder area suffered the largest number of trim bruises, the heaviest actual trim on a weight basis was in the hip area. Looking at the results from an economic standpoint, the significance of hip injuries becomes quite apparent. Bruise injury sustained in this area accounted for 52 percent of the financial value of all trim loss and 56 percent of the total devaluation loss. This is not surprising, however, since the loin or hip area embraces the highest priced cuts of dressed beef.

For example, during the time that these tests were being conducted, choice loins (from hips) were selling for 60 to 68 cents a pound, whereas shoulder cuts were moving at about 38 to 40 cents a pound.

The high devaluation loss suffered due to damaged hips or loin can be explained on much the same basis. The devaluation was assessed against the side of beef in most instances because the most desirable section of the side had been

damaged. The trade would not accept the side at a price which would represent carcass weight times carcass price.

Only a relatively small number of sides were devalued for any reason other than a hip or loin injury.

In some instances, trimming multiple bruises gave the side an overall ragged appearance, rendering it a little less desirable. A small discount had to be made to move it. Of the total number of devalued sides, about 17 percent were discounted because of multiple bruising, and the like.

In discussing these figures with the cooperating packers in the survey, we discovered two things: (1) the trim loss was somewhat higher than had been suspected—actually very few packers indicated that any effort was made to keep track of such loss; and (2) the percent of total loss from hip or loin injury was somewhat lower than had been thought to be the case. Generally, [illegible] packers indicated that hip [illegible] loin bruises probably repres[illegible] thirds to three-fourths of to[illegible] loss. Figures obtained dur[illegible] tests indicated that such inju[illegible] counted for somewhat less than [illegible] cent of total loss.

Type of Cattle

Data obtained during the variou[illegible] were tabulated by steer or heifer [illegible] if there was any significant differ[illegible] bruise loss as between animal typ[illegible] 2). From a financial standpoint, the [illegible] bruise loss on steers was approxim[illegible] three times as great as that on he[illegible] The trim loss on steers was [illegible] double that of heifers. From the s[illegible] point of devaluation loss, in some [illegible] over four times as much financial los[illegible] curred on the steers as did on the hei[illegible]

Insofar as actual number of [illegible] bruises was concerned, the two type[illegible]

Table 2.—*Bruise loss per 100 head by type of cattle and carcass location*

Type of cattle and carcass location	Number "trim" bruises	Number "fire" bruises	Pounds trim tissue	Financial trim loss	Devaluation loss	Total financial loss
Hip						
Steers	29	25	21.0	$14.31	$28.13	$42.44
Heifers	19	29	10.1	6.94	10.01	16.95
Rib						
Steers	13	7	6.6	3.22	3.73	6.95
Heifers	5	8	1.8	.97	0	.97
Shoulder						
Steers	29	42	15.1	5.93	6.87	12.80
Heifers	29	34	10.0	4.18	0	4.18
"Other"						
Steers	16	21	8.1	3.62	14.74[1]	18.36
Heifers	15	21	5.3	2.47	2.40[1]	4.87
Whole carcass						
Steers	87	95	50.8	27.08	53.47	80.55
Heifers	68	92	27.2	14.56	12.41	26.97

[1]Includes sides devalued because of multiple bruises over the carcass, "firey" appearance, and [illegible] carcass condition due to bruising.

tle did not differ too greatly—87 trim uises on steers and 68 on heifers, or out 25 percent more for steers. But e intensity of bruise on steers was uch greater, for the trim weight for eers was about 87 percent greater than r heifers. This, of course, accounted the higher value of trim loss.

Each type suffered approximately the me number of fire bruises. If the two pes of cattle were compared from the ndpoint of bruises on each carcass cation, the same general pattern was served.

One principal exception should be ted—considerably more sides of the rcass of steers were devalued than r heifers. This shows up in table 2 der the devaluation loss column for e carcass category "Other." The deluation loss on steers was about seven mes as great as that on heifers. This ference was accounted for primarily the sides that were devalued for the ultiple bruise injury and general carss appearance. This usually means at the entire carcass was more or ss "firey."

Why was the loss on steers greater an on heifers? At least a partial swer may be obtained from observaons made of cattle handling during the rvey.

In the first place, steers generally ere larger—they not only weighed more t they were bigger framed. When the eer moved through narrow facilities, e distances between its sides and the des of the facility (alleyway and so rth) were much less than for the smaller ifers. Therefore, the likelihood of pact and subsequent bruise injury was eater. This added weight and size so made steers somewhat more awkard and clumsy during the various ndling procedures.

The general reaction of the two types of animals to handling had some bearing on the higher steer bruise loss. Heifers were somewhat more skittish, particularly in the first handling phase of sorting and loading. Steers reached higher emotional excitement, evidenced by fear or at least by actions which indicated fear. Frequently they reacted violently to particular handling situations and threw themselves into obstacles. Of course, this meant that impact was harder.

As stated before, the laboratory research indicated that a high emotional state tended to lower bruise resistance. It may be that the pronounced difference in the bruise loss on the two types of animals, as indicated by this survey, was somewhat greater than it actually appeared. One of the test lots, consisting wholly of steers, turned out to be what is termed in the trade as a badly bruised lot. This particular lot showed an overall bruise loss of about $2.77 a head—just a little less than 3-1/2 times the average for all test lots of steers.

However, this badly bruised lot represented only 17 percent of the total number of steers included in the survey. This should mitigate the influence of this lot on bruise loss. While this lot was not typical, neither was it unusual, for such lots occur far too often. Packinghouse representatives indicated that while we ended up with one such lot out of 13, the average range of such lots in packinghouses was from 1 in 10 to 1 in 50.

In analyzing data on this test lot, we found the vast majority of the bruise injury occurred in the later handling phases. Therefore, handling and facilities during marketing and processing were largely responsible for the bruise injury. The condition that caused the loss was one which might well occur somewhat frequently at the particular plant.

Individual Test Lots

Discussions of bruise loss up to this point have dealt with a consolidation of results obtained in all 13 tests. There is much to be gained, however, in considering the results obtained in the individual tests, for they covered a wide range in economic loss. In the test used for illustrative purposes in the appendix, page 32, the bruise loss on that lot of animals was only $6.21 per hundred head. In the section of the report immediately preceding this one, we called attention to a test lot where the total loss was $276.87 per hundred head. A look at the results of the individual tests and a discussion of some of the factors involved in these tests will explain some of this wide range in loss. At the same time, they will indicate the importance of various factors in relation to these losses.

The results of the individual tests appear in table 3. Again, the figures have been converted to the 100-head basis. The total loss column of this table confirms the dramatic difference between the loss on the least damaged lot and that suffered by the one badly bruised lot. Three lots were also above the average of $60 per hundred head, while 10 lots fell below that average. Nearly half the lots suffered [illegible] the $25 to $50 range.

One important factor in the [illegible] of the total loss figure becomes [illegible] with a look at the trim loss figures. [illegible] badly bruised lot had a total loss [illegible] proximately 46 times as great as [illegible] least damaged lot. Yet if we exclude [illegible] this badly damaged lot from the [illegible] loss, the highest loss due to trim [illegible] would be only about five times [illegible] the lowest. Even if we included the [illegible] damaged lot in the trim loss, the difference would be about 13 to 1 rather than 46 to 1. Thus the devaluation loss, reflecting the prevalence of severely damaged sides in a test, accounts for the great variance in the total loss figures.

A total of five different packing plants were involved in these tests. In several instances several tests were conducted at a single plant. The results obtained where more than one test at a plant was conducted were fairly compatible. Total loss figures applicable to the various tests at that plant were either high, low, or somewhere in the middle range. The badly bruised lot was the only one slaughtered at this particular plant, whereas, the low lot—the lot on which the total loss was only $6.21—was one of two lots slaughtered at another given plant. The loss on the second lot was also quite low.

Table 3.—*Bruise loss per 100 head by test lots*

Test number	Number "trim" bruises	Number "fire" bruises	Pounds trim tissue	Financial trim loss	Devaluation loss	Total financial loss
Test 1	28	13	21.4	$15.04	$ 30.96	$ 46.00
Test 2	36	71	22.0	14.06	9.00	23.06
Test 3	40	133	17.3	10.13	20.88	31.01
Test 4	44	116	28.4	15.03	14.90	29.93
Test 5	40	87	38.7	22.89	51.73	74.62
Test 6	46	100	28.4	15.14	0	15.14
Test 7	53	168	17.9	10.71	15.85	26.56
Test 8	54	96	14.4	6.21	0	6.21
Test 9	81	103	35.6	16.58	0	16.58
Test 10	176	115	58.5	30.44	77.92	108.36
Test 11	144	89	38.7	18.44	11.80	30.24
Test 12	100	60	37.1	18.04	23.38	41.42
Test 13	177	64	157.5	82.31	194.56	276.87

All of this indicates that packinghouse facilities and handling at the packinghouse had a significant influence on bruise loss. The record of potential bruise-causing incidents occurring in the various tests and the correlation of those incidents to the bruise record substantiates this. Most of the identified bruises occurred during the pre-slaughter and post-slaughter phases at the packing plant.

Plants with the highest total loss had the most awkward and complex facilities and handling, in general, was rough. Likewise, the plant where the lowest losses occurred—referred to in the appendix, page 32, was the plant with the simplest, most practical and smoothest operating facilities, and the handling was uniformly good.

During the other handling phases such as loading, unloading and yarding, some test lots received higher percentages of bruise loss than did others, but the difference was not too great.

While it seems fair to give considerable weight to the influence of packinghouse facilities and handling to total bruise loss, other factors beyond the control of the slaughterer may very well have been responsible. Here we are thinking in the terms of variations in grade, variations in resistance to bruise injury, and other such factors.

The principal reason for discussing the individual tests is to stress the many factors involved in bruise loss. An average figure is only a general indication of such loss and may have little or no application to the situation prevailing at a given facility. This problem will be discussed in greater detail in a later section of this report dealing with general implications of the survey.

Carcass Grade

People in the livestock industry have generally held that bruise injury and the consequent financial loss were closely related to the grade of the animal. They felt that cattle in the prime or top choice grades usually had considerably less carcass bruise damage and subsequent loss than those grading lower—standard, commercial or utility.

They reasoned that the higher graded animal had the advantage of a protective layer of fat which served as a cushion when impact occurred. This, in turn, meant that light impact would probably do little more than rupture blood vessels in the fatty tissue and result in a fire bruise. In the lower graded animals with no fat covering impact would result in a damage to the muscle tissue. This was the case in the laboratory research referred to earlier.

For this reason, we included test lots of animals representing the various grades. We experienced some difficulty in setting up a sample on this basis since packers usually purchased the lower grade animals on the open market rather than direct and, as previously noted, it was necessary that directs be used in this survey. Although the majority of animals in these various tests fell in the choice or top good grade, a sufficient number of other cattle were included so that the tests actually covered animals grading from low prime to commercial.

Although actual packer grades were obtained on all carcasses of test animals (that is, the various USDA grades were broken into top, medium and low), consideration of bruise loss as related to

carcass grade was confined to the broad USDA terminology in the following analysis. Actually only three of these broader grades were used: choice, good and standard. Since most of the animals fell in these three grades, we decided they were sufficient to provide a representative sample.

The survey data for bruise loss on the basis of carcass grade is presented in table 4. A quick glance at the total loss column confirms the belief of the livestock industry that there is a special relationship between carcass grade and bruise loss, for the financial loss is progressively higher as grade decreases.

If the total trim weight was the same in all grades, the resulting financial loss would be higher for choice cattle than for standard cattle because choice cattle might be bringing 40 to 45 cents a pound, whereas standard cattle might be commanding only 34 or 35 cents. But table 4 shows that at even considerably lower prices for the lower grade, the overall loss figures are much higher than for the best grade—choice. This, of course, indicates that the bruise damage itself—trim loss and devaluation loss—was much higher for the plainer and lower grades.

Perhaps a better way to consider the likelihood of carcass bruise injury is to ignore the financial factor altogether and look at the various grades on the basis of total number of trim bruises, total number of fire bruises, and [illegible] weight. If this is done, virtu[illegible] same picture is obtained. [illegible] number of bruises requiring [illegible] progressively higher as the [illegible] grade fell. Choice cattle had on[illegible] two-fifths as many trim bruises [illegible] standard cattle. While the variation [illegible] so far as fire bruises was concer[illegible] not so great, the same pattern pre[illegible]

This is also true if weight of [illegible] considered except that there was [illegible] difference in the trim weight be[illegible] good and standard grade carcasses [illegible] almost twice as much trim as be[illegible] good and choice. One reason for [illegible] much higher trim weight in the low[illegible] plainer grades of cattle has already [illegible] mentioned. These plainer cattle ha[illegible] protective fat covering and, hence, [illegible] injury was more apt to be in the [illegible] tissue which requires trim. In [illegible] cattle, choice or prime, the impact [illegible] caused the trim bruise in the pl[illegible] grades might easily have produced [illegible] a fire bruise in these higher grades.

Still another way of comparing [illegible] liability of bruise injury on a carc[illegible] grade basis has been introduced in [illegible] by a column headed "Number of [illegible] bruise free." This column shows [illegible] in a given lot of 100 head of cattle [illegible] tain number could be reasonably expe[illegible] to show up in the packinghouse [illegible] without trim or fire bruises.

When we look at the figures [illegible] column, virtually the same pictu[illegible]

Tabel 4.—*Bruise loss per 100 head by carcass grade*

Grade	Number "trim" bruises	Number "fire" bruises	Pounds trim tissue	Financial trim loss	Devaluation loss	Total financial loss	Number [illegible] with no [illegible] loss of [illegible]
Choice	56	85	26.6	$14.57	$14.14	$28.71	36
Good	96	102	58.8	31.04	55.50	86.54	25
Standard	141	110	54.1	28.60	72.46	101.06	15

[illegible]esented as when the figures in the total [illegible]s column and the various bruise col[illegible]ns were considered. Here consider[illegible]ly larger number of choice grade than [illegible]ainer grade cattle came through bruise [illegible]ee. More than twice as many choice [illegible] standard cattle and a little more than [illegible] third more choice than good came [illegible]rough bruise free. All in all, there [illegible]ems ample evidence that bruise inci[illegible]nce and bruise loss have a positive [illegible]lationship with the grade of the cattle.

Perhaps the best lesson that can be [illegible]arned from a study of the information [illegible] table 4 is this. Even though plainer [illegible]rades of cattle cost less and sold for [illegible]ss, the increase in bruise damage was [illegible]uch that the financial loss was consid[illegible]rably out of proportion to the invest[illegible]ent involved when compared with fan[illegible]er grades. Those in a position to be [illegible]ffected by this loss should give con[illegible]iderably more attention to safe, sane [illegible]andling of lower or plainer grades of [illegible]nimals.

Location in Truck

During the loading of animals into the [illegible]otortruck we made a record of which [illegible]nd of the truck the animals finally were [illegible]ransported in—whether they rode in [illegible]ront of the divider or behind it. We [illegible]anted this information because animals [illegible]hat moved past the divider and rode in [illegible]he forward end of the truck had to nego[illegible]iate a narrow entrance way. Thus they [illegible]ere more likely to suffer some bruise [illegible]amage from impact of some part of the [illegible]ody with the sides of this narrow opening.

Most of the test lots were moved in [illegible]rucks with center dividers of various [illegible]ypes. Some were permanent with a nar[illegible]ow gate at one side. Others were movable and could be swung closed after the animals were herded into the forward end of the truck. In this latter case, the injury likely to be sustained was lessened because only those animals apt to be struck by the divider when it was closed would be affected. With the permanent type divider, each animal entering into the forward portion of the vehicle was exposed to likely bruise damage.

The overall bruise loss was somewhat higher on those animals transported in the rear of the truck rather than those in the front. This would indicate that this extra exposure to potential bruise injury insofar as the divider is concerned was not a factor.

However, a better measure of the influence of this particular type of hazard can be gained by a closer inspection of the unidentified bruise record. The percentage of unidentified trim bruises was about the same for each of the two groups, but in the case of fire bruises, animals moving in the front section of the truck sustained approximately 10 percent more unidentified fire bruises than those moving in the rear.

This may be considered as some evidence of the potential bruise-causing effect of the divider. No conclusive evidence was obtained, however, in this test to indicate that the hazard factor of this particular facility was such as to single it out for particular criticism or to regard it as a major factor in bruise injury and loss. Even if the divider resulted in some bruise injury, its use could well prevent more serious injury from happening. If the divider were not there, animals might crowd into one end of the vehicle which could well result in one or more of the animals going down. This, of course, might produce extensive damage.

Handling Phase

Relating bruise injury to the various handling phases was the most important single part of the survey. This is true because the "how and why" of bruise injury could best be established by this technique. If there is to be any substantial reduction in bruise loss, this how and why must be established in order to devise ways and means to correct loss-causing situations.

As previously pointed out, the entire time that the cattle were in the marketing and processing steps was divided into four major handling phases—loading, unloading, yarding and slaughter. The exact point at which one phase began and ended is illustrated in the detailed test described in the appendix, page 45.

We kept the record of potential bruise-causing incidents occurring to each individual animal by handling phase and carcass location. The record of actual bruise damage, of course, was by carcass location alone. The relationship between the two was established by comparing the actual carcass damage record with the potential injury record. If the carcass injury was at the same point on the animal where a potential bruise-causing incident occurred during a given handling phase, we assumed that the incident bore a relationship to the damage.

Likewise, in those instances where there was no carcass damage and no record of potential bruise-causing incident, what might be termed "compatibility" between handling conditions and practices and carcass condition was also established.

In this survey we obtained a degree of compatibility of about 70 percent. This meant that the potential bruise-causing incident record was in accord with the actual carcass damage record in three-fourths of the time. In the remaining cases, there was no record of a potential injury-causing incident and no resultant carcass damage; or else there was carcass damage which could be related to no potential bruise-causing incident.

The record of all tests also indicated that about 50 percent of all bruises requiring trim were positively identified. These identified bruises accounted for 56 percent of the trim weight and 58 percent of the trim value. In addition, 6 percent of the devalued sides were identified, and these represented 72 percent of the total devaluation loss. Overall, approximately two-thirds of total financial loss due to carcass injury (bruises) was identified. The highest degree of identification was in the case of hip injuries (loin bruises) and the lowest as applied to rib injuries.

In arriving at the degree of compatibility, we decided any questionable instances on a conservative basis and resolved them in the favor of non-compatibility. In addition, in a few instances during the survey conditions arose that resulted in inability to record potential bruise-causing incidents that were observed. This, of course, caused some deficiency in this segment of the record, and probably resulted in a lower degree of identification and compatibility than would have been the case had the record had been complete.

It was never anticipated that 100 percent accuracy could be obtained in these tests since the conditions under which they were conducted were far above laboratory controlled conditions. The sacrifice of accuracy is believed justified in view of the significant contribution made by conducting the tests under conditions ordinarily prevailing in the handling of livestock.

Table 5 shows results obtained on the basis of relationship of bruise damage to various handling phases. Again, this is on the basis of theoretical 100 head of cattle. Totals in table 5 for each of the various carcass locations, as well as the total for the entire animal differ, somewhat from similar figures appearing in table 1. Circumstances during some of the tests were such that although accurate records of actual carcass injury could be obtained, the record of potential bruise-causing incidents in the various handling phases was incomplete or blurred.[5] Therefore, these particular tests were omitted in compiling the data in table 5.

Essentially, where any question of reliability of the record of potential bruise-causing incidents existed, these tests were thrown out of the tabulation contained in table 5 in order to insure fairness to the cooperating parties and to maintain the highest degree of reliability possible. Actually, only two tests

Table 5.—*Bruise loss per 100 head by carcass location and handling phase*

Carcass location and handling phase	Number "trim" bruises	Number "fire" bruises	Pounds trim tissue	Financial trim loss	Devaluation loss	Total financial loss
Hip						
Loading	4	4	3.1	$2.10	$2.24	$4.34
Unloading	2	1	2.5	1.77	5.98	7.75
Yarding	(1)	1	.2	.11	.32	.43
Slaughter	11	12	7.1	4.77	8.04	12.81
Rib						
Loading	1	(2)	.2	.12	0	.12
Unloading	1	(2)	.2	.11	0	.11
Yarding	0	0	.0	0	0	0
Slaughter	1	3	.6	.36	1.29	1.65
Shoulder						
Loading	2	2	1.1	.44	1.02	1.46
Unloading	1	1	.5	.23	0	.23
Yarding	(3)	(3)	.1	.06	0	.06
Slaughter	11	8	5.6	2.25	2.08	4.33
"Other"						
Loading	(3)	(3)	.1	.02	0	.02
Unloading	(3)	0	.1	.06	0	.06
Yarding	(3)	1	.5	.28	0	.28
Slaughter	7	10	3.7	1.66	8.46	10.12
Total carcass						
Loading	7	7	4.5	2.68	3.26	5.94
Unloading	5	2	3.3	2.17	5.98	8.15
Yarding	1	2	.8	.45	.32	.77
Slaughter	30	33	17.0	9.04	19.87	28.91

(1) One in 1,000 head average.
(2) One in 250 head average.
(3) One in 500 head average.

[5] The principal cause for incomplete or blurred records, insofar as potential bruise-causing incidents are concerned, was due to the failure of portable tape recorders to function properly during certain of the handling phases.

were deleted, but one of these test lots happened to have a relatively high bruise loss. This loss is reflected in the higher loss figures shown in table 1, as compared to the figures in table 5.

Gross total figures in table 5 show that most of the identified bruises were related to the slaughter phase. In other words, this phase accounted for the largest number of trim bruises, the largest number of fire bruises, the most pounds of trim tissue, the highest trim loss, the largest devaluation loss, and the greatest total loss. However, we should emphasize these are gross figures and not precise measures.

Loading appeared the second most costly phase of all of these categories, except for devaluation loss and total loss, where the unloading phase ranked second.

It was somewhat surprising to find that the bruise loss associated with handling during yarding was extremely low. However, subsequent checks referred to earlier in the report indicated that this figure was not very much out of line.

If we look at these overall figures from another viewpoint, the majority of identified bruise loss occurred after the cattle were in the hands of the final buyer. The loss at this point was approximately double the loss during the time the animals were in the hands of transporters and marketers.

But it is well to examine the data in table 5 by carcass location of bruise injury because the proportionate "share of responsibility for damage" is somewhat different than for total figures. Further, the reason for the high losses in the slaughter phase can be better pinpointed—at least so far as carcass location is concerned.

While the slaughter phase [illegible] for approximately twice as much identified bruise loss on a total basis did the other handling phases. from hip injuries were about divided between the slaughter phase all other phases.

On the other hand, losses in the cass category "Other" were just 300 times as great for the slaughter phase as for other handling phases. probable reason for the almost division of losses in the hip loss cat was that during all of the various dling phases hips were particularly nerable to bruise-causing incidents it was only during the slaughter that the backs of cattle were partic susceptible to bruise injury. The jority of trim bruises, and consequent trim weight and trim loss contained the "Other" category, were in the of back bruises.

During the slaughter period the mals were much more closely confined. As they moved along in the slaughter process, handling procedures often resulted in bruising their backs. For example, normally catwalks traversed the entire distance from holding pens adjacent to the kill area to the knocking box and the driver was, therefore, stationed above the animals. In using persuaders he naturally struck the animals on the back.

In addition, the majority of gate partitions along this route were of the descending type and, frequently, struck the animal across the back when being closed. Still other back bruises which might be related to this slaughter phase were caused by animals riding across the back of one another as they proceeded single file through the narrow passageways characteristic of this handling phase.

While the figures contained in table 5 do not include unidentified bruise injury, the identified bruise pattern may well apply to a rather substantial portion of those bruises not identified. Some of this unidentified bruise loss may also have occurred immediately before the time the animals came under observation. This would be particularly true if a great deal of sorting took place during the time the animals were being assembled for shipment. Frequently this sorting was done by the "gate method," which can easily result in carcass injury when the sorting is hurried and the gate carelessly used.

At least some part of the unidentified bruise loss occurred during the time the animals were in the vehicle being transported from ranch or feed lot to destination. Naturally, animals did not stand stock still all of the time. During the journey some of them struck one another or the sides of the vehicle with sufficient force to result in some sort of carcass damage.

Observations made during the survey indicated about one-fourth to one-third of the unidentified bruise loss should be attributed to sorting before loading or to conditions and happenings in transit. This would make these two phases responsible for from 12 to 16 percent of total loss.

Relationship of carcass damage to various handling phases was not the same in each one of the tests. While a larger number of actual bruises requiring trim and fire bruises were always associated with the slaughter phase in each test, the severity of these bruises, as represented by trim weight, trim value, and devaluation loss, differed rather widely. For example, in one test 52 percent of the identified loss occurred during the loading phase, whereas in another test 81 percent of the identified bruise loss occurred during the slaughter phase. In all of the various tests, however, losses attributed to the yarding phase were low.

Of course, such things as cattle grade had a bearing on the different results obtained in the various tests insofar as bruise loss was concerned, but these other factors had little or no relationship to the incidence of loss in various handling phases. However, these variations pointed strongly to the influence of particular facilities and to handling which occurred during the various phases in the different tests.

In other words, rough handling and complicated or poorly engineered facilities often caused more bruise injury and bruise loss. This was borne out in the various tests conducted as a part of this survey. Where facilities were complex, as in slaughter plants, a high degree of relationship between bruise loss and that handling phase was established. Likewise, where rough handling occurred during loading or unloading, the bruise loss went up.

In evaluating the results in table 5, it becomes important, therefore, to look upon the figures as gross indicators of conditions existing on an overall basis in the survey and not as precise measurements of what degree of responsibility could reasonably be assigned to any given handling phase on a general basis. However, the survey involved a sufficient number of tests and a sufficient number of different facilities in all phases to justify the results as gross indicators.

Causes of Bruise Loss

The preceding section of this report presented data on the extent of bruise loss and damage which occurred during the various tests of the overall survey. These data were correlated on the basis of carcass location, type of animal, individual tests, carcass grade, location in truck and handling phase. Although some reference has been made to causes or factors which might affect the indicated bruise loss, no real discussion of these matters was presented. Actually, the references previously made were given primarily to clarify or further explain the bruise loss data.

It became apparent during various tests that certain handling conditions and practices did, in fact, have an extremely close relationship with carcass injury. The major purpose of this research project was to relate these to carcass injury. So throughout the entire survey every effort was made to accumulate information which would establish this relationship.

Before turning to a detailed discussion of the causes of bruise losses, one important point should be made. All the causes of carcass injury and subsequent bruise loss could, and did, occur during all phases of handling. Some were of a greater importance during one particular handling phase than during another. Nevertheless, the following broad categories of causes of bruise loss at all phases were found: (1) animal characteristics; (2) facilities; (3) handling techniques; (4) handler's actions and attitudes; and (5) miscellaneous factors (weather conditions, length of haul, and time in stress conditions).

Animal Characteristics

Bruise loss data in the previous section of this report indicated the influence of type and grade of cattle on subsequent bruise loss. Animals whose carcasses graded out lower were more susceptible to bruise injury. Likewise, steers appeared more susceptible than heifers. Therefore, class and grade must be considered as affecting bruise loss. Also, within a given class and grade, other animal characteristics or animal conditions had positive bearing on the injury sustained.

We have already referred to the variation in bruise resistance that exists in cattle. This bruise resistance was influenced by previous bruise injury, and by introducing certain chemical compounds into the system. Certainly, the inherent bruise resistance of a given animal, regardless of the reason for the resistance, must be considered as a factor affecting bruise loss in these particular cattle.

Research showed that the emotional state of the animal was also closely associated with bruise susceptibility. The possibility of bruise loss is greatly increased with highly excited animals for they are not easily controlled. They become somewhat frantic, which usually results in a considerably higher number of impacts.

Couple this with the established fact that this emotional state also lowers bruise resistance and it is easy to see why in such situations these animals suffer higher bruise injury. This was borne out in certain of these tests. On two occasions, animals became unusually excited and fractious during the loading operation. In each case, there was an increase both in the number of potential bruise-causing incidents in this particular handling phase and in the number of trim and fire bruises on the

loading phase.

Likewise, the high incidence of bruise damage associated with the slaughter phase could well be related to the emotional state of the animal since at this point operating conditions frequently resulted in exciting the cattle.

Perhaps one of the most positive pieces of evidence obtained on the relationship of emotional state to bruise injury occurred in one test. The animals were left alone during the slaughter phase and more or less moved themselves through the narrow passageways and into the knocking box. No one was there to drive them, no persuaders were used. In fact, the animals' natural curiosity and "follow the leader" instinct brought about this quiet movement during the slaughter.

When the bruise results of the tests were accumulated, we found that this particular group of the test lot suffered little or no injury which could be connected in any way with the slaughter phase.

The general health of the animal may also have some bearing on the likelihood of its suffering bruise injury. Weak animals, crippled animals or those with lowered resistance are highly vulnerable to such injury. These animals frequently went down during transit and even during the slaughter operation. They were, of course, then trampled on and required some rather vigorous action on the part of handlers to get them up and move them along.

At least two animals in the tests could be characterized as not being in good health. Both of these animals fell during the various movements of the handling and both animals sustained a high

the four sides involved, three ... to be subsequently devalued because of carcass injury.

In addition, a higher degree of bruise loss on other animals in the lot occurred than normally would be expected. Some of this could well be attributed to the fact that when the weak animal went down in the vehicle, the other animals in the load became confused. Considerable pitching and tossing caused impacts of such a degree that bruise injury was likely. The presence of a weak or crippled animal in any lot increased the likelihood of bruise injury to the entire lot, as well as to the animal itself.

Of course, anyone who found it necessary to ship a crippled animal or one not physically strong had it within his power to isolate this animal from the rest of the lot, both as a protection for the distressed animal itself and for the rest of the animals in the load. Certainly, most packers recognized this, for cripples or weak animals were usually slaughtered separately and not subjected to the usual conditions prevailing on the normal slaughter line.

While some of the animal characteristics mentioned above lay beyond the control of human beings, some of these characteristics could be controlled, at least to some extent, by handlers. This was particularly true insofar as the emotional state of the animal was concerned. The handler was in position to conduct his work in a manner which could either raise or lower the emotional pitch. If he realized that new and somewhat strange surroundings confused and disturbed the animal and, at the least, created a sense of uneasiness, he would know that his own techniques could do much to allay these fears and provide for safe handling.

Facilities

In discussing the influence of various facilities on bruise injury, we are referring to the permanent or semi-permanent structures and layouts in the various handling phases.

More specifically, we are talking about such things as corrals, holding pens, loading chutes, receiving docks, scales, stockyard alleyways and pens, and the layout and equipment used by packinghouses in the slaughter process. We also included vehicles used to transport animals.

Certain facilities appeared in one form or another in more than one handling phase. For example, there were holding pens at feedlots, in stockyards, and at packing plants. Likewise, there were loading or unloading chutes at all three of these points. On the other hand, some of the facilities were peculiar to a single handling phase. For example, knocking boxes and spray pens were peculiar to packinghouse slaughter layouts.

Almost any of the above mentioned types of facilities was different. That is, the lack of uniformity in construction, size and operation was bewildering. In fact, a detailed description is almost essential to make it absolutely clear just what a given facility was like.

For example, the term "loading chute" is almost inadequate. True enough, most loading chutes had similar appearance, but the similarity ended there. To aptly describe such a facility, we would have to give width, length, height of sides, degree of incline, type of incline and so forth.

This lack of uniformity makes a discussion of the influence of facilities on bruise loss quite difficult. Thus the following discussion treats each facilities in a rather general way paid particular note to the more characteristics each of the types of facilities possessed. In instances, we noted the more type of a facility if it appeared to have closer relationship to bruise loss, or bad.

Much has already been said of loading chutes without attempting to give "perfect" or "ideal" specifications. A good loading chute had at least two essential characteristics: (1) it was only wide enough to allow a single animal to pass through it comfortably; and (2) it was constructed that the animal could not be diverted by happenings taking place on either side of the chute during the time that he was moving through it. If the loading chute was too wide, two or more animals could enter or attempt to enter at the same time, resulting in a wedge. The greater width could also enable an animal to attempt to turn around in the chute, which could also result in a wedge. Both of these situations resulted in bodily contact with the sides of the chute and if the wedge was tight enough, bruising could well result. Evidence of this was obtained in some of the tests in this survey.

Construction to prevent the animal from observing happenings going on alongside the chute was desirable. Even relatively insignificant happenings distracted the animal and caused it to stop its forward movement. This sometimes resulted in a traffic jam, requiring at the very least the use of a persuader to start the animal. This, of course, invited the possibility of additional carcass injury.

In addition if one came to an abrupt halt, pile-ups and confusion resulted. There was likelihood of widespread bod

pact on several animals and, of course, creased bruise damage.

Where it was necessary for animals go up an incline to enter a vehicle, is incline was usually a part of the ading chute. Stair steps had some adantage over rampways or cleated inlines. Of course, good footing must be integral part of the chute. If the anal falls, it is almost impossible for im to avoid contact with one or both ides of the chute, and the impact may e sufficiently severe to result in bruisng. If the chute is used for both unading and loading, the necessity of aving a small area at the top of the hute which is level and straight is quite pparent.

Animals unloaded from vehicles onto oading chutes which began with stair steps or rampways not only had great difficulty in maintaining footing, but fell frequently. In addition, animals exhibited a certain wariness when confronted by such situations and, frequently, it was necessary to provide excessive encouragement. Higher bruise loss, therefore, resulted both from the spills and falls and from the use of persuaders directly. Persuaders also caused animals to become fractious and strike themselves against the doorways of the vehicle.

What has been said about the width of loading chutes is equally applicable to other situations where animals can best be handled single file. In particular, it would apply to packinghouse slaughter areas. Where long, narrow alleyways led to slaughter facilities, there was considerably less confusion, and less bodily impact. Also less bruise loss showed up on the carcasses.

Of course, alleyways moving through stockyards or through large outside holding areas did not have to meet this requirement. In fact, they seemed better if they were wide enough for several animals to move abreast. The principal consideration in a case of this type alley (stockyard alleys and so forth) was that they be free of obstacles, whether on their surface or along the sides.

Protruding posts, partially opened gates, and gate fixtures set out into the alley were responsible for many of the potential bruise-causing incidents during yarding. Although the alleyway may have been straight and wide, such obstacles were almost always responsible for some bruise injury, regardless of how carefully the animals were handled. In other stockyards, where these conditions

Cattle moving through stockyards often face bruise hazards. Note the "pocket" caused by the half-open gate and the obstructions protruding along sides of the alley.

e yards virtually "bump free."

Gates and partitions were, of course, a very essential part of all of the facilities listed above. Whether or not they exerted any influence on bruise loss was primarily determined by the manner used. If left partially open, forming an obstruction, they increased bruise loss. If swung too carelessly, so they struck an animal, they influenced bruise loss. But if used carefully and judiciously, they could actually reduce likelihood of injury.

Partitions, or gates serving as partitions, frequently prevented overcrowding at various points during the handling phases. During the slaughter phase, this partition prevented animals from turning back or backing out of passageways, actions that could result in tripping and falling or cause other situations sometimes resulting in greater bruise injury. Of course, sharp corners, protruding nails, splintered boards and the like should not be tolerated since each of these could result in carcass damage.

The use of given facilities was just as important as the construction of the facility itself. No matter how sound and well a gate was constructed or how perfectly it was stationed along an alleyway, throwing it into a hip of a passing animal still resulted in serious loss.

Perhaps one of the most important considerations with facilities is that they be kept as simple and uncomplicated as possible. We have already referred to the fact that packinghouses with relatively simple kill floor layouts had the lowest identified bruise loss attributable to handling during the slaughter phase. Simple layouts are particularly important at the packinghouse. The situation here is one of limited time for handling and

y its very nature, is especially
dering, confusing and excitement
ing from the animal's standpoint.

When we speak of simplicity
out, we refer to alleys and passage
which had a more or less natural
quence. Once an animal entered,
ceeded voluntarily in the proper w

Sharp turns, followed by extre
short straightaways and succeeding
turns were confusing. Some of the
rinths bordered on the fantastic.
mals were started in one direction,
a virtual U-turn, proceeded 50 feet,
another U-turn, and then after anot
25 or 30 feet were called upon to
another U-turn. Put such a layout
in a situation taut with tension and
citement and it is obvious that anim
will become frightened. Impacts
occur which can result in increas
bruise loss.

From the time an animal is taken
of his familiar pasture or feedlot
dispatched at the slaughter house
faces strange surroundings and sit
tions. If these situations are kept
simple as possible, there is the
likelihood for confusion or bewilderme
Carcass injury is bound to be lessened.

Insofar as facilities to transport
mals are concerned, this report can
briefly only on the motortruck since
was the only type transportation inv
during this survey. Use of interio
viders or partitions in separating
trailers into two compartments pose
likelihood of additional bruise-caus
incidents. Data obtained indicated
additional injury did result from
contact with these dividers. Re
showed that where partitions are
extra precaution should be taken in
ing and unloading to minimize excite
and to allow animals to pass through

ow openings, in a manner to reduce
e possibility of impact.

Perhaps the most important feature
motortrucks, insofar as bruise loss
as concerned, lay at their back door.
he ordinary vehicle used to transport
ivestock had a very narrow end gate or
xit. Unfortunately, it was frequently
ramed with sharp open angle irons or
hannelways. The majority of potential
ruise-causing incidents which occurred
uring loading and unloading happened
hen animals were actually passing
hrough this doorway. At this point im-
act frequently occurred, particularly if
he animals were moving too rapidly or
ried to crowd through more than one at
time.

Some few trucks had narrow
tes framed by rounded or cushioned panels. In these cases, while there were almost as many "bumps" sustained, the number of fire or trim bruises associated with these bumps was negligible. This would indicate that sharp corners on any facility are particularly hazardous and closely related to severe bruise damage.

Improper loading, as typified by overcrowding or loading so loosely as to allow for shifting, was closely related to bruise loss. In both of these situations, the possibility of impact was greatly increased.

This was particularly true in the case of overcrowding. When this condition

Narrow tailgates on trucks are a critical factor in bruise damage. The sharp channel iron and overlapping slats can inflict severe damage when an animal bumps against them. Obviously, "hurry" is out of place here.

existed, animals frequently fell during transit, with resultant trampling. In addition, when the time came to unload, jamming increased at the rear exit. This, of course, resulted in heavy impact of shoulders and hips with the sides of the narrow end gate.

Good footing is of particular importance in trucks. Animals not only have to acclimate themselves to confined areas and new surroundings, but they must become accustomed to the sense of motion. Many commercial livestock haulers started out the journey at relatively low rates of speed. This practice helped reduce the likelihood of carcass injury, for animals gradually became used to the motion of the vehicle and thus remained calm. They had an opportunity to catch on to the technique of maintaining footing in a moving vehicle.

Handling Techniques

This section on handling techniques and their relationship to bruise injury emphasizes methods and procedures used in moving livestock through the various handling phases. Handler's attitudes and actions will be discussed in the next section.

The techniques—the methods and procedures—are usually closely related to the various handling phases—for example, certain loading techniques, unloading ones, and those applying to various steps in yarding and the like. In general, all of the techniques have as their objective the orderly and expeditious movement of livestock safely through a given handling phase. Some of the techniques accomplished this objective with considerably less risk of carcass injury than did others.

The observations which follow [illegible] from experience gained during the [illegible] vey, buttressed by an analysis [illegible] potential bruise-causing incidents [illegible] of the actual damage found on the [illegible] casses of the test animals.

One example of a handling techni[illegible] which involved a certain amount of bruise hazard was the "gate method" of sorting. Actually, if this technique was properly executed, the potential bruise-causing happenings could be few. Nevertheless, the nature of the procedure itself required that it be recognized as a potential cause of bruise loss.

The loading operation, as usually practiced, involved starting the animals up the loading chute and then getting behind the cattle and providing whatever amount of encouragement that was necessary to keep them moving. Actually, this technique often failed because the encouragement was often applied to those animals not responsible for the hold up.

A better technique was to apply the encouragement at a point nearer the entrance to the vehicle itself, usually where the slow down occurred. Frequently an animal already in the loading chute decided to stop. If there were 10 or 15 animals in the lot and the driver was standing behind all of them, hitting the rear animals across the rump did not have very much effect on the animal standing virtually at the door of the truck, maybe 10 or 15 feet away from the [illegible].

On the other hand, a light tap with the persuader on the animal which had stopped could cause it to move forward and into the vehicle, thus removing the blockade and restoring an orderly flow of movement. The usual technique of applying encouragement at the tail end of the line often resulted in milling and confusion and subsequent carcass damage.

When animals were unloaded from trucks, some drivers practiced an effective technique to reduce the possibility of bruise loss. The driver stood at the side of the rear door. If more than one animal attempted to come through the exit, he merely placed his hand in front of one of them. This usually caused that animal to step back and the likelihood of two animals becoming wedged in the doorway was averted.

Perhaps one of the most important handling techniques was that of providing animals with a measure of friendly handling before shipment to market or slaughterhouse. Frequently animals had been alone on ranches or in feedlots with little or no contact with human beings until the day arrived for their shipment. As a result, the appearance of a man was disturbing.

But if several days before shipment the producer had gone out and walked around among the animals and let them become accustomed to him, they were much easier to handle, less likely to become excited, and more willing to enter strange and unnatural situations. It was not necessary to move animals about during this period although moving them from one lot to another in easy, careful stages could be beneficial.

Test lots which received friendly handling when they were tagged went on to load much easier than other animals from the same group of cattle that had not received this handling since they were not included in the test lots. Records of bruise loss obtained from cooperating packers on these animals not in the test lots indicated that their bruise loss was uniformly higher.

Another handling technique that reduced the possibility of carcass injury was particularly useful during yarding operations. This technique involved what J. C. Rosse of Livestock Conservation, Inc., has aptly termed "allowing cattle to obey their 'follow the leader' instinct."

Observation of several thousand head of cattle moving through public stockyards, in various feedlots, and on several ranches, would appear to prove that cattle do have a "follow the leader instinct"—that there may even be some sort of social order among them. Where yarding was unhurried, one animal assumed leadership and the others in the lot then followed it along the way. This technique greatly reduced the use of persuaders and the necessity of any vocal encouragement. In turn, the movement of the cattle was much more orderly and considerably less likelihood of carcass injury arose.

This technique could also be used to a limited extent during the slaughter operations at a packing plant. Earlier in this report we illustrated a situation during one of the tests when animals virtually followed the leader into the passageways leading to the knocking box and into the knocking box itself.

But kill operations are usually on a schedule and it is somewhat more difficult to fully employ this loss-saving technique. However, many packing plants could make better use of the technique by making relatively minor changes in facilities adjacent to the kill area.

Handling technique during the slaughter process which had a significant bearing on increased bruise injury involved the use of knocking boxes large enough to hold more than a single animal at a given time. When two and sometimes three animals were placed in this small area, it was virtually impossible for the first animal stunned not to be trampled by the remaining animals. Those facilities which permitted only a single animal

to be loaded into the box at a time eliminated this hazard.

Unfortunately, many who handle livestock regard the use of persuaders as their principal handling techniques. Actually, this is not a technique, but it may constitute an integral part of a technique—such as in the loading phase described above. Judicious use of persuaders at the proper time may facilitate movement without causing injury. However, it is rarely possible to place a persuader in the hands of a human being with the certainty that he will use it judiciously or that he will select the "right time."

Recently, a great deal of attention has been focused on the use of tranquilizers to facilitate the movement and handling of livestock. Using these drugs is said to allay fear and excitement and to permit more orderly and safer handling. None of the test animals in this survey were treated with these drugs so it is impossible to make any comment or observations on their effect. But use of the drugs may be developing as a new handling technique. Using tranquilizers in livestock handling also indicates the significance of the emotional state of the animal as an effect on carcass injury.

Handler's Actions and Attitudes

The handler's actions and attitudes may well be the one cause that holds the key to reducing or eliminating bruise injury. Regardless of the excellence of facilities, the soundness of handling techniques, and the most favorable set of animal characteristics, disastrous bruise loss could occur if the men handling the livestock did not adopt the proper attitudes and actions.

For example, in the test described in detail in appendix, page 39, the packing plant had the most favorable set of ties. Yet, it would have been possible for the personnel res for moving the cattle through these ties to have handled the animals a manner as to raise their emo pitch to the frenzy level—result milling and pitching—and thus brought on severe impacts. They have used persuaders in such a m as to run up the incidence of bruise particularly on the backs of the In such a case, the excellence facilities would have been comp nullified by the actions of the han

In some instances, the facilities considerably less than excellent b careful and considerate handling driver kept the animals calm. A mum amount of potential bruise incidents resulted. Hence a rel low bruise loss was attributable handling phase.

Human conduct also affected loss for good or bad in every ha phase of each test lot included survey.

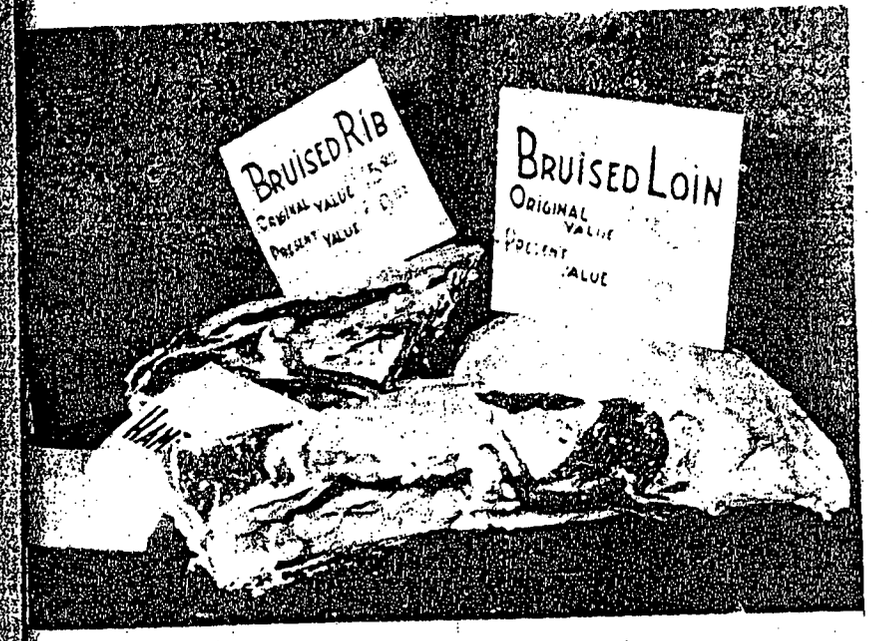
In general, handling accorded lot of cattle reflected to a consider extent temperament and attitude handler at the time the movement taking place. Ample evidence duri survey supported this statement. some reason the handler was in a pe or angry mood, his treatment cattle was invariably rough or careless or both. Likewise, handlers who peared worried, preoccupied, or di terested were careless. If things go too well, tempers frequently ex and rough handling ensued.

Of course, many things can affect temperament and attitude of a livestock handler—working conditions, outside factors of a personal nature, even

gs as the weather and the animals nselves. Handlers and their employ- can minimize the influence of unfa- able temperaments and attitudes. t these people must be impressed the effect their actions can have n cattle in their charge.

An appeal can be made on the basis economics, particularly on how car- s damage may affect income and profit subsequently job security. Nothing be lost by an appeal for humane treat- nt. The owner of livestock, whether be producer or packer, can also in- on proper handling. By doing so he can bring about training programs and educational drives aimed at impressing handlers with the importance of their job. If it is within the owner's province, he can take corrective steps to guarantee such safe handling. After all, the man who owns the cattle is in the best position to deal with this problem.

Hurried handling was the largest single cause of bruises. A preceding section of this report described the handling technique of utilizing the "follow the leader" instinct. The livestock industry generally considers this technique effective in minimizing bruise loss. But the



These primal cuts emphasize the importance of careful handling. Here $18 has been lost through bruise injury.

technique cannot be used if hurry becomes paramount in handling. Not only did hurrying result in an increase in potential bruise-causing incidents but in many cases it retarded rather than facilitated handling. In effect it was self-defeating.

For example, when animals were unloaded from a vehicle, efforts to hurry them out of the truck by the excessive use of persuaders accompanied by loud voices usually resulted in confusing and exciting the cattle. Not only was there a marked increase in the number of bumps sustained but a considerably longer time was required to finally get all the animals out of the vehicle. Actually, if the driver was in a hurry, he would have better accomplished his purpose by taking his time.

There is no justification for hurrying on any basis. Facility in movement is desirable but this can be best attained by proper handling techniques. Even in the slaughter phase at packinghouses, where kill schedules are a matter of concern, safe handling techniques can better meet these schedules than can the intemperate handling which usually accompanies hurry.

Carcass injury from hurrying was likely to result in two ways. First, if the animals were moved too fast, they were likely to become unduly alarmed. More impacts of the animal's body with that of another animal or with a stationary part of a given facility could occur. Second, the ordinary method of hurrying animals with persuaders—frequently in an excessive and abusive manner—could cause bruise damage.

Miscellaneous Factors

Although weather did not appear as important with cattle as it was with other species of livestock, it exe[rted] influence on carcass bruis[e]. For instance, precipitation co[uld] surfaces over which animals [had] to become slippery or slicken[ed] was difficult for them to maint[ain] Even under the most careful [of] conditions, slips and falls we[re] occur and some carcass injury [to] The only remedy was to spread [the] faces with materials that afforded [a] footing and to move the animals as [slowly] and cautiously as possible.

But the weather also exerted influence on bruise injury in less [obvious] ways. Experienced livestock men [have] long contended that animals are [sensi]tive to changes in the weather. [When] such changes are imminent or in [pro]gress, animals may become unu[sually] fractious and difficult to handle. [We] found this to be the case in the [cattle] tests in this survey.

Even though livestock men recognize the unsettling effect of change in weather conditions, many of them select just this particular time to market cattle. While there may be times when this is justified, many might do [so] more efficiently if they became more fully aware of the relationship of bruise injury to the emotional upset of animals during these changeable weather periods.

Previous studies of Farmer Cooperative Service indicated that length of haul has a bearing on dead and crippled losses. Increased lengths-of-haul produced higher incidence of death and crippling. The same would probably hold true in bruise injury. Of course, a major consideration would be the time during the transit period.

Unfortunately, no test lots in the survey moved over distances of sufficient length to provide for an analysis

varying lengths-of-haul. However, cooperating packing plants indicated some increase in bruise injury on those lots of cattle moved over extremely long distances. The frequency did not increase on anything like the scale for other species of livestock. This result agrees with the dead and cripple loss statistics compiled in the previous FCS studies.

One other factor of importance was related to the so-called "stress factor" in animals. It has already been observed that animals react to strange surroundings. Animal psychologists tell us that this results in a stress condition. This may be reflected in anxiety or uneasiness. These latter conditions have been found closely related to carcass injury and loss from bruising.

Other researchers have indicated that both length of time animals are subjected to stress conditions and what might be termed "the degree of change" involved affect the stress level. Thus if a shipment of cattle were subjected to unfamiliar conditions and if these conditions persisted over a greater period of time, likelihood of bruise injury would increase.

This problem can be met in three ways:

1. Friendly handling during the time animals are in unfamiliar surroundings would help calm them and allay their anxiety and fear.

2. Facilities should be constructed or adjusted to minimize complex movements in order to move the animals as naturally as possible. For example, loading chutes were often spread with hay and refuse when new. This cut down uneasiness on the part of cattle using the chute for the first time.

3. Handling during these periods of stress should be as swift as safety allows in order to reduce the time that the animal is subjected to the stress condition.

Some Implications of the Survey

Bruise loss is a major problem of the livestock industry, as data in this report show. Substantial savings could be effected if it were possible to reduce this loss. If we assumed that total loss were the same as the lowest bruise loss in this survey, bruise loss on a national basis would still be in excess of $1 million a year. If we use what appears a more nearly representative figure for rate of loss, this national bruise loss figure would be between $8 and $12 million a year. While the loss cannot be entirely eliminated, it can be substantially reduced, provided corrective measures are taken.

The survey showed that the industry was grossly underestimating at least one portion of the loss. We refer to trim loss. The majority of packing concerns, in calculating their own bruise loss figures, included only carcass devaluation loss, actually only about two-thirds of the total loss. Tests conducted as a part of this survey suggest that trim loss should be re-evaluated and properly considered as a loss factor. While some tests had no devaluation loss, trim loss occurred in all tests.

No single segment of the livestock industry can be saddled with full responsibility for bruise loss. Losses occurred during each handling phase in direct relation to the frequency and severity of potential bruise-causing injuries which took place. The tests showed that in

all handling phases, which in turn represented various segments of the industry, the likelihood of bruise injury was greater than in other handling phases. At the same time, some tests showed that these more hazardous phases need not be responsible for the largest bruise loss, provided that judicious and careful handling coupled with efficient facilities prevailed.

The important point is that various factors could influence the bruise loss in any handling phase. Therefore, if conscientious efforts are made to control the bruise-causing factors, any segment of the industry can favorably alter its bruise loss pattern.

The industry needs to recognize that this is really an industrywide problem. Each segment must accept some measure of responsibility for it.

This survey clearly indicated that livestock can be handled safely through the various handling phases and end up as damage-free sides of beef in the packinghouse cooler. Combined results of all tests in the survey, without regard to type and grade of cattle, showed that about 30 percent of all test animals escaped bruise injury during handling from ranch through processing. Of course, this percentage varied from test to test. Significantly those tests where facilities were the best and where handling was uniformly good were the tests with the highest percentages of bruise-free carcasses.

The same conclusion that cattle can be handled safely can be justified on the basis of results obtained in any given handling phase as well as on the basis of all phases collectively. Although this record was much more favorable in certain handling phases, in each p substantial number of cattle were without suffering any damage. fore, the desirable goal of bruise livestock is within reach.

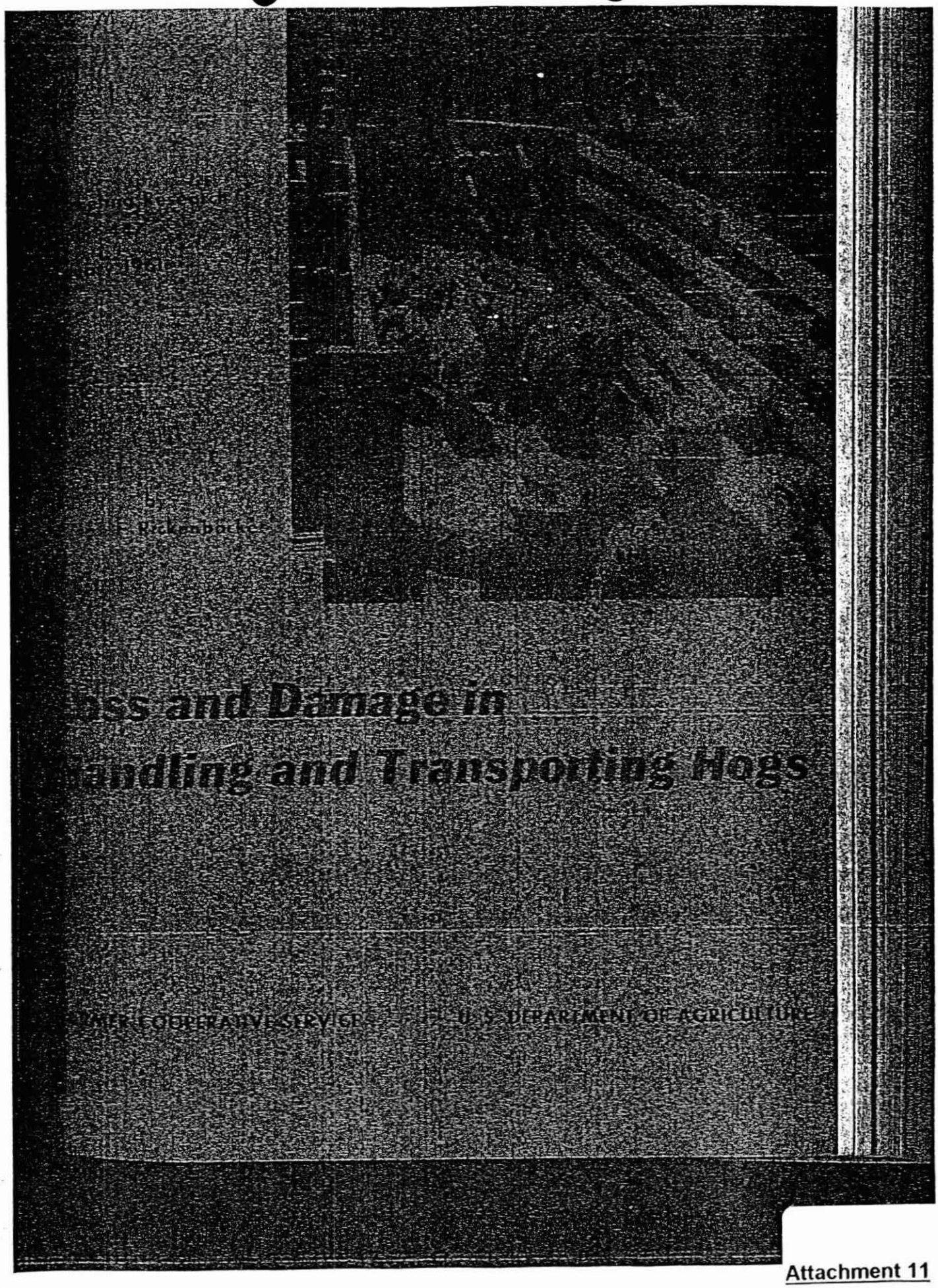
The survey also implies possibil if not ways and means, of reachin goal. Basically, the goal can be attained by control of bruise-ca factors, but at least three possibil ought to be given special emphasis. are rather obvious, and, in mos stances, would not require the expe ture of large sums of money or ne sitate extensive research. Adopting simple, "natural" facilities would en handlers to take advantage of the handling techniques and procedures. could be a very effective means of re ing the goal. Likewise, promoting handling programs designed to handlers to the relation of their actio and attitudes to carcass injury could much to increase the number of bruise free carcasses hanging in the cool

One other possibility is worthy of mention. While it may seem somewha remote at the moment, it should not be dismissed too lightly. This has to with the likelihood of raising the bruise resistance of cattle. Earlier in this report we mentioned work done at Ohio University that indicated bruise re ance could be increased by introdu certain chemical compounds int system of cattle.

No doubt a great deal of research be necessary before such compo can be perfected to the point where can be administered safely and and on an economical basis. But co ering the strides made in r cent ye animal husbandry and veterinary me cine, we can assume that research to fect the compounds will be forthcom

An added stimulus to this activity may ell come from the pharmaceutical and hemical industries which have recently come active in the livestock field. The ccess these industries have had with ystemic grubicides, antibiotics, feed supplements, and the apparent su they are going to enjoy with tranquilizers may well prompt them to expand their interests to the particular problem of raising animal resistance to bruising.

ATTACHMENT 6



Attachment 11

Summary

Loss and damage to hogs associated with handling and transportation in marketing and processing are estimated at $22.6 million a year, based on average prices prevailing over the years 1957-59.

This national figure includes losses due to death in transit, condemnations of carcasses and primal cuts, and carcass bruise damage. On a per-head basis, this total loss reflects bruise damage amounting to 11.39 cents and death and condemnation losses of 8.02 cents and 6.16 cents, respectively.

A series of four handling and transportation tests were conducted by Farmer Cooperative Service beginning in April 1959. These determined the extent of such losses and explored the relationship they might have to handling conditions and practices ordinarily prevailing in the movement of hogs from concentration points to slaughter.

The four periods of research were on a seasonal basis and conducted in the midwestern and western sections of the United States in cooperation with Livestock Conservation, Inc., transportation and marketing agencies, and the packing industry.

A total of 211 test shipments of hogs moving by rail and truck from midwestern origins to slaughter plants located in the Rocky Mountain and Pacific Coast States were included in the study. These shipments involved some 29,000 head of swine observed during assembly, loading, at stops en route, unloading, [illegible] yarding. Post-slaughter exam[illegible] tions of the carcasses gave data [illegible] injuries or other conditions resul[illegible] ing in loss.

The value of tissue trimmed [illegible] carcasses because of bruise injur[illegible] accounted for 40 percent of the [illegible] bruise loss. Devaluation of p[illegible] cuts caused by severe or c[illegible] trim-out of damaged tissue, or [illegible] made up the other 60 percent. [illegible] far the largest loss due to bruis[illegible] was found in hams; this was fo[illegible] at 7.38 cents a head. Bellies [illegible] shoulders, in that order, were [illegible] next most critical carcass [illegible] affected but the total loss on [illegible] cuts was less than half that su[illegible] on hams.

These tests confirmed re[illegible] previous studies of FCS and [illegible] agencies which had showed [illegible] tive relationship between inc[illegible] lengths-of-haul and rising [illegible] Total losses rose 47 per[illegible] shipments moving an ave[illegible] 1,900 miles over those tra[illegible] 1,000 miles less. Increases [illegible] from condemnation and dea[illegible] largely responsible for this in[illegible] in total loss since bruise lo[illegible] clined on the long distance sh[illegible] after showing a rise on [illegible] moving about 1,400 miles.

This somewhat negati[illegible] tionship of bruise loss to [illegible] lengths-of-haul indicated tha[illegible] injuries resulting in bruis[illegible] must have occurred during [illegible] handling rather than du[illegible]

over the road haul. A number of control test shipments--moving an average of 125 miles, and conducted by a subsidiary of the major research supported this conclusion. Although certain other factors were involved, bruise loss on these shipments was highest of all.

Seasonal variations in weather and climate were associated with changes in the level of losses. The two seasons of weather extremes (summer and winter) showed the highest losses. Death loss rose dramatically during these times of the year. Although pneumonia was the cause of condemnation in all seasons, it was three times more prevalent in winter. From another standpoint, adverse weather was closely related to bruise damage. This was determined by the identification of carcass damage with handling mishaps from icy or rain-slicked surfaces of facilities, and hazardous driving conditions in the case of truck shipments.

Average weight of hogs in the shipments was 223 pounds. Overall shrink averaged 5.89 percent. Shrink was 0.6 percent greater on rail shipments than on those moved by truck. Hot yield (before carcass was put in cooler) on test hogs was 70.72 percent--only a 0.08 percent higher yield being realized on truck shipments. Shrink increased and yield decreased as shipping distances grew longer and time in transit increased.

Truck losses exceeded rail losses per hundred head. Death loss on truck shipments was the major factor in the overall higher loss on motor carrier loads. This loss was over three times higher than on rail shipments. This offset somewhat higher bruise and condemnation losses on rail shipments.

Since the volume of truck shipments was concentrated in movements averaging about 900 miles in length-of-haul, we compared the two types of transport in the 900 mile distance group for more valid results. This comparison indicated a higher truck loss of $5.79 per hundred head with death loss still the dominant factor as it was slightly under four times as great as rail death loss.

Detailed records of observations of handling conditions and practices made during assembly, loading, unloading, yarding, and the like, revealed that the most frequent forms of mishandling were abusive use of persuaders, rushing and hurrying animals during loading causing pile-ups and overcrowding in chutes, slips accompanied by severe body impact with facilities, and careless handling resulting in hogs falling from elevated ramps.

About 18 percent of the shipments were subjected to hazardous conditions in transportation equipment and about 14 percent to unsafe conditions at loading facilities at origin points. Comparing losses on those loads where these abuses or hazardous conditions were observed with losses on loads not subjected to mishandling or unsafe conditions showed a positive relationship between handling conditions and practices and losses. Losses on the shipments mishandled were 27.5 percent higher than on properly handled loads.

If the loss rates found to prevail in those shipments associated with mishandling or hazardous equipment, or both, were applied to total annual slaughter of hogs in the United States, an increase in loss of more than $6 million a year would be reflected. Obviously, control and reduction of losses and the conditions

related to them are of paramount importance to the livestock and meat industry.

This study shows that control is not an insurmountable problem but it applies industrywide because every segment of the industry is affected by the loss and damage. Most of the loss-associated conditions can be corrected or controlled without the expenditure of large sums of money, although some [illegible] will be required to effect significant improvement in some cases.

Convincing those who actually handle hogs that their role is important in loss reduction should be of first consideration. Education in safe handling can accomplish much but creating a desire to accomplish stock friendly, careful handling may well be the best answer.

attitudes of personnel actually moving or handling the cattle, and miscellaneous factors such as weather, length of haul, and the like, were found to have a positive relationship to bruise injury.

While the largest number of bruises occurred after the animals were in the hands of packing concerns, the tests clearly indicated that carcass injury occurred in every handling phase beginning with sorting and loading at the feedlot, in transit, through receiving facilities, and until actual slaughter.[1]

Handling and transportation losses are particularly important in the case of hogs. The principal reason for this is that "deficit" and "surplus" production areas of hogs are scattered throughout the country. At the same time, major slaughter areas are also widely scattered and, in many instances, far removed from surplus production areas. Slaughter facilities are usually located in areas of greatest population, and consequently of larger consumption, while production has been centered in those areas where feed, especially grain, is abundant.

Millions of hogs are moved each year from these surplus production areas to slaughter facilities located elsewhere. This movement often involves distances up to 2,000 [illegible]. Such movements, of course, [illegible] the animals to considerably [illegible] handling--hence, the likelih[illegible] losses associated with handli[illegible] transportation is greatly incre[illegible]

While it is true that this pa[illegible] of production and slaughter [illegible] changed somewhat recently, [illegible] basic pattern still remains. [illegible] is reason to believe it will c[illegible] to prevail for some time to [illegible] The Nation's principal grai[illegible] duction area is not likely [illegible] shifted. Latest population [illegible] indicate the rate of growth of [illegible] consumption areas is far grea[illegible] sections of the country where [illegible] are in short supply. Materia[illegible] provements in refrigeration, [illegible] panied by expedited movement [illegible] favorable freight rate differen[illegible] fresh meat over livestock, [illegible] essential to any major or pe[illegible] change in the basic pattern [illegible] production and slaughter.

For these reasons, Farme[illegible] erative Service initiated th[illegible] dealing with loss and damag[illegible] during handling and trans[illegible]

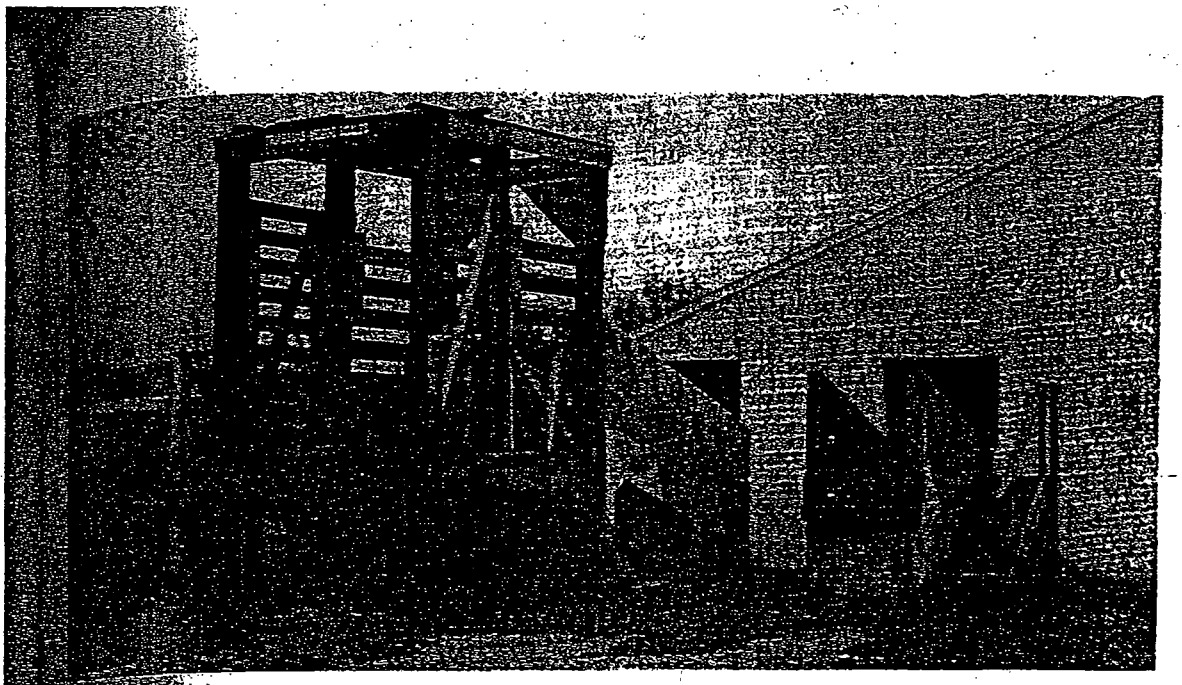
The study utilized ap[illegible] which provided information [illegible] eral facets of the problem [illegible] a picture of general co[illegible] prevailing in the probl[illegible] Specifically, there were [illegible] jectives:

1. To accumulate data [illegible] mine the estimated econ[illegible] occasioned by different [illegible] jury, damage, or disease [illegible] sought on loss and dam[illegible] death and crippling in t[illegible] demnation due to injury [illegible] and carcass damage [illegible] ing.

[1] Complete reports on the research done by Farmer Cooperative Service and referred to above are available in the following publications: Rickenbacker, Joseph E., Losses of Livestock in Transit in Midwestern and Western States, Mar. Res. Rpt. 247, Farmer Cooperative Service, U.S. Dept. of Agr., June 1958.

Rickenbacker, Joseph E., Causes of Losses in Trucking Livestock, Mar. Res. Rpt. 251, Farmer Cooperative Service, U.S. Dept. of Agr., June 1958.

Rickenbacker, Joseph E., Handling Conditions and Practices Causing Bruises in Cattle, Mar. Res. Rpt. 346, Farmer Cooperative Service, U.S. Dept. of Agr., August 1959.



...new and modern country buying station boasts excellent handling facilities including stairstep ...and well-planned holding pens. The large dock has an adjustable ramp for loading double-deck trailers.

...To collect information on han... ...conditions and practices pre... ...on the movement of hogs from ...tion areas or concentration ...to slaughter. A positive asso... ...between these factors and ...categories was established ...cattle by the FCS study. Work ...by other researchers indicated ...association existed for ...

...To use the data obtained to ...mine and measure the relation... ...ship of handling and transportation factors to the various categories of loss. If positive relationships were established, it might be possible for the study to point the way to changes and improvements in handling and transportation designed to help the industry reduce such losses.

We felt a study conducted along the lines named and pointed toward the outlined objectives would help the industry focus attention on the most critical loss areas.

Study Procedures

...Prior beginning the work, we ...series of conferences with ...in the livestock industry most ...sent with the problems inci... ...to the study. We sought advice ...counsel in order that procedures would be adapted to the ordinary day-to-day operations of the industry and would yield information which the industry would find useful in meeting the needs for developing loss curtailment programs.

A proposed program of procedure was developed during these conferences and then discussed in detail with each of the cooperators in the study. Final refinements were then made. The procedures eventually used represented a consensus of the best informed opinion available as to the most practical way to procure the information desired. These final techniques and procedures reflected modifications that limited the data obtained and resulted in less definitive results than might have been desired.

Cooperators were individually instructed as to procedures they should use. These procedures were pre-tested before the work began.

Scope of Study

We placed major emphasis on those shipments of hogs moving relatively long distances to slaughter. Eight packing plants, operated by four different concerns, were selected as test slaughter facilities. These plants were located in the Rocky Mountain and Pacific Coast States.

A number of origin points in the Midwest were selected to provide coverage of a widespread segment of the major production area, and to include public stockyards, auction markets, and country buying stations. Origins and destinations chosen were located to allow full consideration of diverse routes of movement and varying lengths-of-haul. It was also possible to obtain data on differences in terrain traversed and climate encountered.

Arrangements were made for test shipments to be moved by both of the principal means of transportation -- motortruck and railroad.

Although the study emphasized long distance movements, [illegible] arranged to conduct a limited number of special or control tests [illegible] shipments originating at distances up to 150 miles from slaughter facilities in the Midwest. This was necessary in order to establish controls and to serve as a basis for comparing short haul versus long haul shipments. Also, overall loss estimates would be more reliable since short haul shipments constituted the majority of shipments of hogs to slaughter within the major slaughter areas. Consequently, a Midwestern plant from each of three of the cooperating packing companies participated in a series of [illegible] short haul tests.

Because of the generally accepted idea that the losses under consideration are directly related to weather climate, it was necessary to conduct the study over a period long enough for a variety of weather to prevail.

We decided that selected periods in each of the four seasons of the year would prove adequate. These periods were determined on the basis of the cooperators' advice as to volume and source of animal purchases and after a general study of normal weather in the midwestern and western areas of the country over a period of years.

The first, or spring test, took place during April and the first two weeks of May 1959. The spring series was over a 5-week period. July and August of the same year. The fall series began late in September and ran through the month of November. The winter test series was conducted during January and February 1960.

test periods were quite adein that practically every type weather prevailed at some time the tests. There was rain, and fog, high and low humidity, temperature extremes ranging 10 below zero to 96 degrees

tried to have two test loads ghtered at each of the coopting plants during each week of udy. Unfortunately, circumces did not allow this schedule rigidly followed.

view of the number of people the distances involved in the it was fortunate that only percent of the test shipments not carried completely through test procedures. In addition cerperational difficulties prethe scheduling of tests at of the cooperating plants durcertain periods of the fall and series. Cooperators in the have agreed that a sufficient of tests were conducted on a factory basis and under suffivaried conditions to provide dequate both in quantity and

Test Techniques

ompany representative selected of the test loads. He did this out actually observing the anibut by simply designating a hogs purchased at a given during a particular day. Combuyers were not informed which would be used until after ase was made and the animals ded for shipment. This procedure cluded the possibility of selecting ds on a biased or prejudiced

After the test load was designated, the FCS representative at the origin point witnessed all handling accorded the test animals from that moment until their departure. He recorded on a form the general condition of facilities and transportation equipment and noted handling conditions and practices exercised during the movement and loading of the animals into the truck or rail car.

Hazardous conditions in facilities and equipment included such things as broken rails or floor boards, protruding nails and bolts, improper bedding, and any other defects which might have a bearing on the safe handling of the hogs. The observer noted whether or not persuaders were used; if so, what type, to what extent and to what degree. All slipping, falling, jumping of animals from upper decks or ramps, hurrying, rushing, crowding and piling were noted. He recorded the loading time for each deck, the live weight of the animals, and the temperature, relative humidity, and general weather conditions.

He completed the form by inserting information about routing to be followed, time of departure, and an estimate of what should be the total time in transit.

Another FCS representative observed certain of the test loads at intermediate stops where the shipment was unloaded for feed, water, and rest. In these cases, he witnessed the unloading of the animals and their reloading for the journey to destination. He supplied information similar to that obtained at the origin point. In the event the animals "changed cars," he checked equipment on the outbound car, in addition to reporting the condition of the car which arrived from origin.

While it would have been desirable to have all shipments unloaded en-route kept under observation, diversity of routes and number of feed, water, and rest stops involved precluded such an arrangement. However, a sufficient number of loads were observed under these conditions to provide adequate consideration of the effects such transit stops might have on losses.

When the test animals arrived at their destination, an observer witnessed their unloading and their movement into packer holding pens. He recorded condition of equipment on arrival; off car weight; presence of dead or crippled animals, or both, in the test load; observations as to handling accorded; prevailing weather; a value judgment as to the physical appearance of the animals after the journey; and any observations which would contribute to an overall evaluation of handling during unloading.

A final form dealt with observations made during and after slaughter. The carcass location of any trim made as a result of bruise damage was recorded and the we[ight] of the trim tissue obtained. In addition, a tabulation was made of [bruise] marks appearing on the carcass. [If] any carcasses or parts were con[demned], this information was [recorded]. A post-slaughter examination of [the] casses supplied data pertaining [to] devaluation of cuts because of excessive bruise injury. The hot dressed weight (before the carcass was placed in the cooler) was also obtained in order that yield figures could be derived.

Description of the techniques and procedures shows that a rather complete record was maintained of the movement and handling of the test loads from the time they were designated as tests until after slaughter. We made every effort to insure uniformity of reporting. Instruction manuals accompanied each form and, in addition, communications were maintained with the various observers in order to clarify problems which might have resulted in distortion of data. For the most part the same personnel were used throughout the entire study. When changes occurred, the new personnel received firsthand instruction.

General Appraisal of Losses

In utilizing the material obtained during these tests, we considered three classes of losses -- death, condemnation, and bruise injury. Perhaps it would be well at this point to clearly define each of the classes of losses under consideration.

Categories of Loss

By dead loss, we mean the value of those animals which arrived at destination already dead [or] which died immediately after loading at the packing plant. [The] time of movement to slaughter included were one or two [days] in which carcasses were [removed] from the shipment at the [feed] and rest point because [they] had already died before. It would have been more meaningful if it had been possible to perform an autopsy on each of the dead animals in order to determine the cause of death. This was not feasible.

discussions with plant personnel and with veterinarians justified the conclusion that, in most cases, death could be attributed to the same causes which resulted in subsequent condemnation of animals arriving alive but found unfit after slaughter. If this conclusion is correct, the principal causes of death in transit were pneumonia, icterus (jaundice), and some form of blood poisoning. In many cases where deads and condemnations occurred in the same shipment, cause of condemnation was one of these three conditions.

Entire carcasses, or parts thereof, are condemned when the meat is judged "unfit for human consumption." All fresh meat products moving in interstate commerce are inspected by the Federal Meat Inspection Service. Its inspectors condemn the unfit carcass or parts.

In general, they condemn the meat because of disease or conditions resulting from injury, but some other conditions may also result in condemnation. For example, parasites in organs such as the liver may result in their being condemned. Where only some portion is affected, it is not necessary to condemn the entire carcass but rather only to remove the affected part. Thus, all bruised tissue is trimmed from the carcass and condemned.

The major area of condemnation loss in hogs is the ham since many are affected by arthritis. This disease renders this most valuable portion unfit for human consumption.

Condemnation loss in this report includes all condemnations of entire carcasses and condemnations of primal cuts. We have not included loss which may have accrued due to condemnation of organs, such as livers, sets, and hearts; condemned heads; or arthritis. While these latter losses are meaningful, the general feeling within the industry is that these condemnations are not too closely related to handling and transportation incident to marketing.

As with other species of livestock, two factors determine loss from bruise injury: (1) loss from trimming away injured tissue, and (2) a so-called "devaluation loss" which results when the trimout has been of sufficient severity to lower the value of the primal cut in excess of the loss occasioned by the value of the trim itself.

For example, a belly may have a considerable amount of tissue trimmed away as a result of bruising and still be fit for use as a No. 1 side of bacon. In this case, the loss would involve only the weight of the trimmed tissue. In other cases, the location of the damage on the belly might be such that this particular cut could not be used for No. 1 bacon but might have to be processed into the company's B or C grade bacon. In such cases, there is not only the loss of tissue but the entire belly drops in value. This drop of the overall cut is the devaluation loss.

Calculating Economic Loss

Significance of loss and damage can best be indicated by the use of dollar and cents figures. We have, therefore, put price tags on the loss estimates established by this study. The dollar and cents figures used were derived as follows:

1. Dead loss - A simple average of prices paid for hogs by packers over a 3-year period (1957 through

1959) was derived from U.S. Department of Agriculture market news service reports. The average live value was determined to be $18.38 per hundred pounds during this period. The dead loss was established by multiplying the average price per hundred weight by the average weight of the hogs in the shipment, of which the dead animal was a part. Thus, if the dead animal was in a shipment with an average weight of 220 pounds, the loss was calculated to be $40.44.

2. Condemnation loss - When an entire carcass was condemned, the same method of computing the dollar and cents loss was used as that for deads. Where only parts of the carcass were condemned, the loss was computed on the basis of the actual weight of the condemned part times the average price of the cut based on a simple average of wholesale prices at Chicago during the same 3-year period (1957 through 1959), derived from reports of the National Provisioner. The prices derived for this purpose were as follows: Hams - 43 cents a pound; shoulders - 25 cents a pound; bellies - 32 cents a pound; loins - 46 cents; fat-backs - 8 cents a pound.

3. Bruise loss - Trim loss due to bruise injury was determined by multiplying the weight of trimmed tissue times the average price of the primal cut from which the tissue was trimmed. Thus, if 3 pounds of tissue was trimmed from a ham, the trim loss was $1.29. This loss was computed for each cut on the carcass where bruise trimout was observed, and the total of the losses on the affected cuts became the total trim loss on the carcass.

The other factor in bruise loss was obtained from the post-slaughter inspection of the carcass and [illegible] added to the trim loss to obt[illegible] overall bruise loss on a given [illegible] mal. In general, this devaluation [illegible] was computed on a cents-per-pound basis so that the figure would [illegible] main constant regardless of cha[illegible] in prices of the cut. For exam[illegible] in the case of a severely dam[illegible] ham, it might be necessary to [illegible] value the ham 3 cents a pound. [illegible] the ham weighed 14 pounds, th[illegible] valuation loss would then be [illegible] cents, whether hams were sell[illegible] for 45 cents a pound or 35 cents [illegible] pound.

Using average prices for the [illegible] year period, 1957 through [illegible]

Loading hogs into the upper deck of [illegible] trailer calls for good facilities [illegible] careful" handling. This loading [illegible] constructed, but note the divider [illegible] the chute and the heavy steel hook [illegible] strike against a handy ham or shoul[illegible] loading in a situation like this [illegible] overcrowding and pileups resulting [illegible] and loss.

[illegible] enable the industry to better [illegible] the loss figures contained [illegible] study. This 3-year period [illegible] a year in which prices were [illegible] considerably higher than usual, a [illegible] in which prices were at virtual [illegible] bottom, and a third year in [illegible] prices were what might be [illegible] average. A review of prices [illegible] since 1950 supports the [illegible] that the average prices [illegible] in the study were representa- [illegible] and as meaningful as any figures [illegible] could be used.

[illegible] loss figures derived on this [illegible] and correlating them to the [illegible] obtained in this study, we [illegible] what the 1959 loss would [illegible] been if applied to a total U.S. [illegible] of about 88.5 million head [illegible] By this method, we esti- [illegible] that the bruise loss would [illegible] been slightly over $10 million, [illegible] due to condemnations about [illegible] million, and the dead loss ap- [illegible] $7 million, or a total [illegible] these three causes of [illegible] $22.6 million.

Losses on Test Shipments

Actual loss figures of test shipments in this study showed that the average total loss per head on the basis of the three specified categories of loss was 25.56 cents based on the 3-year average prices indicated above. The 211 test shipments completed were made up of just under 30,000 head of hogs. The average weight of the test animals was [illegible] pounds. There were 58 hogs dead on arrival, 24 arrived at destination crippled, and 40 entire carcasses were condemned for 10 different reasons. In addition, a number of primal cuts were condemned for various reasons. A total of 3,800 pounds of tissue was trimmed from the carcasses because of bruise injury, and approximately 6,000 primal cuts were devalued.

A matter of particular interest to the livestock industry concerns the carcass location of bruise damage and the relative amount of economic loss it occasions. Table 1 lists the carcass location on the basis of the five primal cuts and gives the dollar and cents loss per hundred head due to trimout and devaluation caused by bruising. Prevalence of bruise injury to the various cuts is further indicated by showing for each cut the percent of total bruise loss associated with the particular cut.

Just under two-thirds of the total bruise loss was accounted for by injury to the ham. Of course, the ham is one of the highest priced of the primal cuts which would tend to make the loss run somewhat higher, but it was found that 60 percent of the total tissue trimmed from carcasses was also related to the hams and that 60 percent of all trim bruises were on hams. This contrasted with the loss on loins, also a higher priced primal cut, which accounted for only a little over 6 percent of total bruise loss. But in the case of loins, the total trim

TABLE 1.—Bruise loss per 100 head by carcass location

Carcass location	Loss	Percent of total bruise loss
Ham	$7.38	64.8
Shoulder	1.15	10.1
Belly	2.03	17.8
Loin	.73	6.4
Fat back	.10	.9
Total	11.39	100.0

weight represented only about 1 percent of the aggregate bruise trim.

Certainly, the figures given in table 1 point clearly to the critical areas of the carcass and suggest where the greatest emphasis on improved handling should be directed. Later on, we will discuss some of the apparent reasons for the relative rates of bruise damage assigned to the various primal cuts.

Factors Affecting Losses

Principal factors affecting losses were length-of-haul, weather, type of carrier, and shrink and yield. This section of the report discusses in detail their effect on losses.

Length-of-Haul

The livestock industry has generally assumed that handling and transportation losses increase as length-of-haul increases. This is based on the belief that the longer the haul the greater the likelihood of injury due to the accompanying increase in the amount of handling accorded the animal, and the greater time the animal is under stress conditions. The FCS survey of dead and crippled animals unloaded at public markets gave validity to this assumption.

That study showed these losses increased for all species of animals. However, the general pattern varied with "mid-distance" hauls (between 750 and 1,750 miles). Losses either slightly declined or remained on a plateau before spurting to new highs at distances beyond 1,750 miles. While some comparisons can be drawn from this earlier study, for the most part, the shipments received at these public markets traveled short distances moving under 150 miles by motortruck.

In the current study, the majority of shipments moved at considerably longer distances, almost half of them covering between 1,800 and 2,000 miles, mostly by rail. However, results from a number of short haul control tests conducted in the Midwestern area broadened the basis for comparison.

Because of the number of origins and destinations involved in the 21 test shipments in this study, it was decided to group the tests into a limited number of combinations which would reflect the average length-of-haul of all those shipments included in the particular group. This was done by weighting the length-of-haul of a particular shipment by the number of animals included and then combining these shipments in the most feasible and logical groups.

Shipments fell almost automatically into the three average length-of-haul groupings shown in table 2—925 miles, 1,425 miles, and 2,075 miles. A fourth group could be included if the control shipments slaughtered in the Midwest were added.

The total loss column in table 2 shows that the expected pattern prevailed. Losses tended to increase as length-of-haul increased. Losses

TABLE 2.--Loss per 100 head and average length-of-haul by major mileage groupings

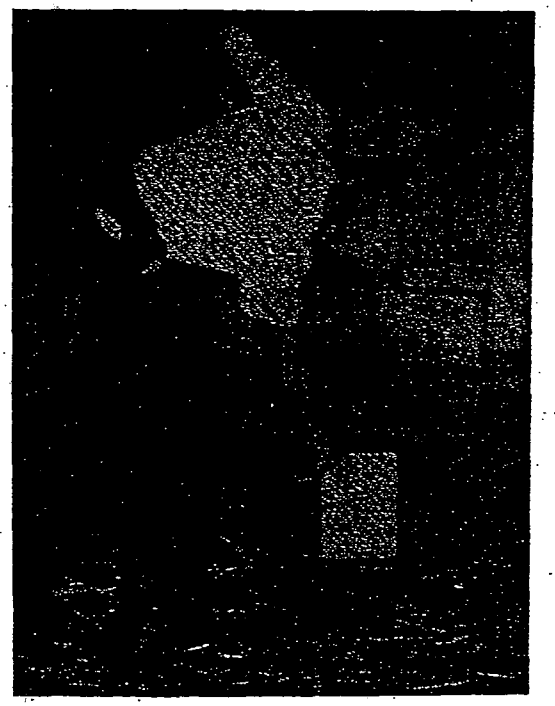
Average length-of-haul in group	Number of head	Method of transport		Bruise loss	Condemnation loss	Death loss	Total loss
		Rail	Truck				
Miles		*Percent*					
925	7,554	62	32	$11.45	$2.11	$6.11	$19.67
1,425	6,656	94	6	13.55	5.61	5.23	24.39
1,925	15,280	96	4	10.42	8.40	10.17	28.99
All tests	29,490	88	12	11.39	6.16	8.02	25.57

1,425 mile group were about 2 percent higher than in the 925 group, and the long distance group shows about 19 percent higher losses than in the middle group.

The same positive relationship between increased losses and greater lengths-of-haul was illustrated clearly in condemnation loss and, to a somewhat lesser degree, in death losses. Bruise loss, however, did not vary much among the three mileage groups. Actually, the loss rose slightly between the first two groups and then declined for the longer movements.

In the control movements (those averaging 125 miles), bruise loss was $19.04 per hundred head, higher than any of the figures shown in table 2. This could probably be explained by the fact that the local shipments often contained animals of a less desirable type and, frequently, of considerably greater weight. This was understandable since their inclusion in long distance shipments would be more or less asking for trouble.

On the basis of the bruise loss figures shown in table 2, it would



A 12-inch gap between the bottom of this gate and the floor is an invitation to disaster where small animals are concerned--especially when there is a steep, inclined rampway on one side as there is just beyond this gate. In the excitement of handling, the smaller animals often manage to get caught or wedged in the opening. Two hogs in one test slipped on the incline and were trapped under the gate. Both carcasses showed up in the cooler with severely bruised hams.

appear that most bruise injury occurred during the early stages of handling and was not influenced to any great extent by the over-the-road movement. For if it were, we should have had considerably higher bruise damage on those shipments which fell into the 1,925 mile group.

Significant differences occurred in the loss per hundred head on total shipments originating at the various shipping points. The same situation was true when the shipments were considered on the basis of point of slaughter.

Each of the slaughter plants received test shipments from only certain of the origin points. No plant received shipments during any one of the test periods from more than six different origins. Likewise, none of the shipping points supplied hogs to more than four of the slaughter plants during any one test period.

Table 3 shows the total loss per hundred head on all shipments originating at the various shipping points and indicates the average length-of-haul applying to those shipments. Here again the loss rate was somewhat lower for the shorter distances than for the longer with slight deviations at origins G and H.

TABLE 3.—Loss per 100 head and average length-of-haul on test lots by origin point

Origin	Average length-of-haul	Loss
	Miles	
A	982	$10.86
B	1,102	22.49
C	1,197	21.81
D	1,241	27.88
E	1,482	30.21
F	1,575	26.64
G	1,646	22.11
H	1,798	22.32
K	1,884	28.01
L	1,886	24.72
M	1,976	37.61
All origins	1,555	25.57

TABLE 4.—Loss per 100 head and average length-of-haul of test lots received at slaughtering plants

Plant	Average length-of-haul	Loss
	Miles	
A	644	$4.11
B	929	24.56
C	968	16.00
D	1,197	21.45
E	1,571	23.38
F	1,745	37.47
G	1,925	25.30
H	1,986	37.38
All plants	1,555	25.57

The same pattern prevailed [illegible] for plant "B" when length [illegible] and loss rates at slaughter [illegible] were analyzed, as in table [illegible] exception to the pattern [illegible] partially explained in that [illegible] received most of its shipments [illegible] shipping points where ob[illegible] noted a higher instance of [illegible] dling than prevailed at mos[illegible] origins.

This same was true of pla[illegible] which also broke the pattern [illegible] what. While the average l[illegible] haul for shipments to plant [illegible] not the greatest, this plant h[illegible] the highest loss rate per [illegible] head.

This analysis of the re[illegible] of length-of-haul to losse[illegible] limitations since it did no[illegible] other factors which might [illegible] equally significant. We t[illegible] minimize these limitations [illegible] ducing the length-of-haul [illegible] considering other loss re[illegible]

ther along in the report, but it seems valid to conclude that, limitations notwithstanding, length-of-haul bore a positive relationship to loss and damage.

Weather

The relationship between weather and losses to livestock has long been recognized. Perhaps more consideration has been given to the possible adverse effects of unfavorable weather on hogs than on other species of livestock. This has been prompted by the fact that in many instances large numbers of hogs have died in transit during periods of extreme heat. A number of similar disaster shipments have occurred during periods of bitter cold.

For many years, campaigns have been conducted during the spring by such organizations as Livestock Conservation, Inc., designed to alert farmers and shippers to the susceptibility of hogs to the effects of heat and humidity. A great deal of research has also been done on ways and means to prevent higher losses during the summer season. Not nearly so much effort has been directed toward the reduction of losses during the winter or extreme conditions of cold.

Since the various tests run as a part of this study were handled on a seasonal basis, we considered the possible relationship of climate to the various categories of loss which occurred to test shipments.

Table 5 shows the loss per hundred head of each of the loss categories on a seasonal basis. The loss from death in transit was much greater in the two extreme seasons--summer and winter--than for the intermediate seasons--spring and fall. In the case of condemnation loss, there was not too much variation between the seasons except for the fall of the year during which the loss rate fell rather dramatically. Bruise loss was higher during the summer months, but the level of loss from bruising remained rather constant over the year.

Summer and winter stood out clearly as the more critical loss seasons, with total loss in summer about 87 percent higher than the low season (fall) loss. Winter losses were 64 percent higher than those in the fall. Losses in the spring were about 23 percent higher than fall loss. This latter was largely because condemnation loss was at its highest point during spring.

The somewhat tenuous relationship between bruise loss and seasonal factors was not surprising since these losses would be expected to have a closer relationship with handling and facilities. Of course, weather could influence handling and facilities in such a way that bruise loss could be affected. For example, loading chutes and ramps could become hazardous because of ice or snow or even become slick from rain. Basically, these are handling problems and can be successfully met by exercising care and using

TABLE 5.--Losses per 100 head by seasons

Class of loss	Spring	Summer	Fall	Winter	Annual
Bruise	$10.70	$13.84	$11.15	$10.01	$11.39
Condemnation	8.32	6.07	1.87	7.84	6.16
Death	3.37	14.17	5.21	12.05	8.02
Total	22.39	34.08	18.23	29.90	25.57

materials to alleviate the hazardous condition.

The somewhat higher bruise rate occurring during the summer months could be more closely associated with seasonal factors. Effect of excessive heat or humidity, or both, resulted in an unfavorable physical reaction in animals, making them more difficult to handle.

Observations of test shipments indicated that the closest relationship between seasonal factors and bruise loss came about because of the effect of unfavorable or unpleasant weather on the personnel handling the animals. Tempers became short, care and caution were often forgotten, and impatience reared its costly head when the handler was loading hogs in the broiling sun or in the driving rain or snow.

Table 6 shows a number of carcass condemnations for various causes on a seasonal basis. Pneumonia was a cause in each of the seasons, but it was much more prevalent during the winter than during other seasons of the year. Icterus, which was the second most important reason for condemnation, was of greater importance during the spring but also occurred in summer and winter.

These two conditions are generally regarded as being the more closely connected with transportation and handling. In the case of pneumonia its relation to adverse weather, particularly extreme cold, has been generally accepted. The data indicated that pneumonia must be considered a definite hazard, regardless of length-of-haul, but that particular care must be taken during winter months where long hauls are involved. While there have not been any major studies positively relating icterus to weather, the results of one important study in this field rather closely parallel the incidence pattern indicated in table 6.

TABLE 6.--Causes of condemnations by seasons and average length-of-haul

Average length-of-haul	Spring	Summer	Fall	Winter	Total
Miles					
900	1 Pneumonia	2 Pneumonia			3 Pneumonia
1,400	1 Asphyxia 2 Icterus 1 Pneumonia 1 Pyemia	1 Pyemia	1 Pneumonia	1 Icterus	1 Asphyxia 3 Icterus 2 Pneumonia 2 Pyemia
1,900	4 Icterus 1 Nephritis 1 Pericarditis 1 Pneumonia 2 Sex Odor 1 Uremia	2 Contamination 2 Icterus 1 Pneumonia 1 Pyemia 1 Septicemia	1 Nephritis 1 Pneumonia	1 Icterus 9 Pneumonia	2 Contamination 7 Icterus 2 Nephritis 1 Pericarditis 12 Pneumonia 1 Pyemia 1 Septicemia 2 Sex Odor 1 Uremia

buttressed the findings in the ... of icterus: Elapsed time in ...ment or distance traveled, or ... may be more closely related ... losses due to condemnation for ... than climate is.

... had been possible to obtain ...es on those animals which ... dead, the death loss figures ... be more meaningful. However, ... reasonable to assume that the ...ity of the deaths in transit ... be attributed to the same con... which resulted in condemna... of animals slaughtered. That is, ... majority of animals dying in ... during the winter months ... died of pneumonia, and the ...ity arriving as deads in the ... shipment may well have died ... result of an icterus condition.

... these assumptions are correct, ... relationship between death loss ... seasonal factors can be ex...ined in much the same way as ... condemnation. The major dif...rence is that, in many condemna... cases, the animal will not expire ... of icterus in the time which ... between the farm and the ...ughter plant.

... whether or not weather factors, ...th-of-haul, or the two com...ined were positively related to the ...s of condemnation or death in ... other than icterus or pneu... cannot be determined from the ... done in this study. Certainly ... weather and the long periods ... in stress conditions cannot be ...ed out as possible factors in both ...demnation and death loss.

Type of Carrier

... is always difficult to compare ... rates for shipments moving by highway versus those moving by railroad. Truck shipments normally move considerably shorter distances than do rail shipments of livestock. Comparison is even more difficult in the case at hand since such a preponderant majority--about three-fourths--of the test shipments moved by rail. However, sufficient lots moved by truck to permit some general observations on the relationship of loss and damage to mode of transport.

We can make the best comparison in the case of those shipments which had average lengths-of-haul of around 925 miles, or our block I mileage group (table 7). In this case, rail accounted for about 60 percent and truck, about 40. Truck shipments accounted for only a very small percentage of the total volume in blocks II and III. On the other hand 100 percent of the local control shipments slaughtered in the Midwest moved by truck. In this latter case, no comparison with rail could be made.

Table 7 gives the total loss per hundred head of shipments moving by rail and by truck on a seasonal basis for each of the three mileage groupings. On an annual basis, truck losses were greater than rail losses, regardless of distance, but considerably greater for the longer lengths-of-haul.

On a seasonal basis, truck losses were considerably higher than rail losses in the two extreme seasons of summer and winter. Rail losses exceeded truck losses in the more temperate seasons of spring and fall. The seasonal comparison was impaired somewhat, however, since during the fall and winter months no truck shipments moved over the longer distances. A closer examination of records of the test shipments

TABLE 7.--Loss per 100 head of hogs by rail and truck by major mileage groupings

Mileage group	Season				Annual
	Spring	Summer	Fall	Winter	
I. 925 miles					
Rail	$17.97	$26.81	$12.85	$8.92	$17.2
Truck	12.13	19.85	7.89	42.81	23.9
All loads	15.96	23.37	11.90	35.66	19.6
II. 1,425 miles					
Rail	27.40	21.16	18.30	14.61	20.5
Truck	No shipments	94.26	No shipments	No shipments	94.2
All loads	27.40	33.25	18.30	14.61	24.3
III. 1,925 miles					
Rail	24.29	37.81	20.95	32.98	28.3
Truck	61.70	54.84	No shipments	No shipments	57.2
All loads	25.42	38.70	20.95	32.98	28.5
All groups					
Rail	23.14	31.31	18.69	27.27	24.2
Truck	17.64	47.44	7.89	42.81	32.4
All loads	22.39	34.08	18.23	29.90	25.3

disclosed the most important factor in the higher truck loss rate was that, regardless of distance, death loss in truck shipments was higher than rail loss--not just higher, but much higher.

Bruise loss was greater on rail shipments except for the really long haul movements but on an all-shipment or distance basis, total bruise losses for each type of transport were only about 15 percent apart (rail higher than truck.)

Rail losses from condemnations were higher on all shipments except those in the number I (925 mile) block.

In block I where the volume of shipment by each of the modes of transport was more nearly equal, a closer examination of the various categories of loss indicated that bruise loss was somewhat over 25 percent higher on rail shipments. Truck losses for condem[nations] were 28 percent higher than [rail] losses and 277 percent higher [than] rail losses from death in transit.

On a seasonal basis, bruise [loss] for block I was higher on rail ship[ments] in all seasons except winter, and it was 30 to 45 [percent] higher in each instance. In winter, however, truck losses in this category exceeded rail losses 57 percent. Detailed records of "high loss" shipments during the winter showed that in several cases drivers reported extremely severe driving conditions--icy roads, heavy snowfall, and buffeting winds. Truck shipments may have been subjected to unusual hazards during the long over-the-road transit.

In block I no deaths were recorded in shipments moved by rail during the fall or winter, and none in shipments moved by truck during summer and fall. Death [loss]

atively low during the spring, but losses were nearly double rail Summer death loss was derately high and confined en- to rail shipments, while winter were quite high and confined truck shipments.

There was a moderate condemna- loss on rail shipments in the series of tests in block I, and more substantial condemnation in truck shipments moving in summer. Other than these two stances, no condemnations were ted.

ased on the data obtained during tests, the following conclusions, tive to rail and truck shipments, were justified:

1. Bruise loss was a rather significant problem in the case of both modes of transport, but should be of somewhat greater concern to railroads than to trucks, except that during winter months where road conditions are extremely hazardous potential bruise damage should be of vital concern to motor transporters.

2. Possibility of death in transit was far greater by truck than by rail. This was true, regardless of distance shipped, but was especially true where shipments moved really long distances. Death loss was a much more significant factor during the extreme seasons of summer and winter.

3. Pneumonia condemnations were quite high for long distance rail shipments during the winter, protection against extreme cold during rail movement should be a matter of concern for railway livestock departments.

4. Since condemnation loss on rail shipments were higher than on truck shipments, such losses would appear to be a more significant problem for rail shipments. Many of the conditions which resulted in condemnations apparently required the extra time involved in transporting animals long distances. Again, protection against extreme cold to reduce condemnation loss from pneumonia was the paramount problem in winter shipments by rail. Some method for combating the incidence of icterus during spring and summer should also be developed if these losses occurring in rail shipments are to be curtailed significantly.

4. In the case of truck shipments moving short distances--such as the local control loads slaughtered in the Midwest--careful attention should be directed toward the assembly and handling of hogs to reduce high incidence of carcass damage from the bruising apparent in these shipments.

Overall, there was not too much difference between the two modes of transport, yet the data indicate that length-of-haul and seasonality should be considered in deciding whether to ship hogs by rail or truck since particular hazards became more important in the one case than the other. These hazards may be of such significance as to clearly indicate the type of transportation best suited.

The most critical factors involving each of the two types of transport should be the subject of close investigation by the respective managements. There is every reason to believe that changes and improvements in procedures can result in the elimination or substantial lessening of these critical areas.

Shrink and Yield

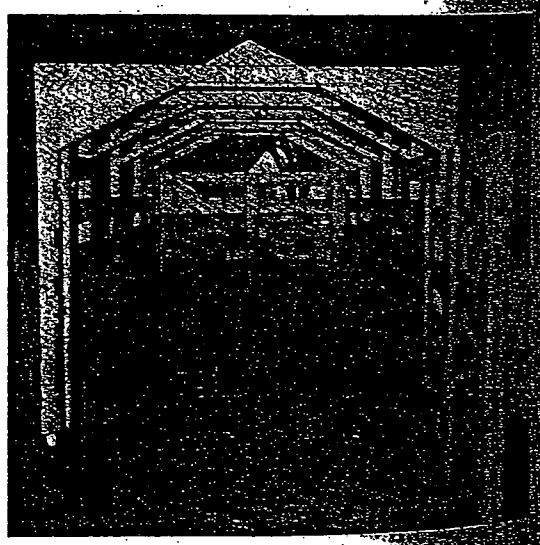
Loss of weight sustained by livestock during the time involved in movement from farm to final destination is a problem of some economic significance. It is perhaps more significant in those instances where the livestock is slaughtered upon arrival at final destination since there is no opportunity for the animal to regain lost weight. The loss of weight involves two factors: (1) A loss from the natural excretions of the animals, and (2) loss in body weight usually referred to as "tissue shrink." Since the loss in weight is associated with handling and transportation, the term "transit shrink" is generally used.

In this study we obtained figures relating to shrink by listing the total live weight of the shipment at origin point and the weight of the animals upon unloading at destination. Actually, the weight at origin constituted the purchase weight rather than the weight at the moment the animals were loaded. However, the amount of handling animals received from the time of purchase until loading operations began was not excessive. It only involved moving the animals from the scales to holding pens adjacent to loading facilities.

In all cases animals were put across company scales at destination plants immediately following unloading from the vehicles. This weight represented the true weight of the test lots upon completion of the transportation period. The shrink represented a difference in the two weights and was stated as a percentage of loss in weight from the weight at time of purchase.

After hogs are slaughtered and dressed, the carcasses are weighed before going into the cooler. T... percent this weight represents... the live weight at origin or time... purchase constitutes the hot yi... After carcasses are cooled... chilled, there is usually a sli... additional shrink and correspond... reduction in weight of the carca... The difference between the... weight and the weight after chill... would represent "cooler shri... The percent the weight of the chil... carcass represents of the ori... weight at origin or time of pur... would be the ultimate yield. Be... of conditions prevailing during th... tests, we have not dealt with th... shrink or ultimate yield.

Average shrink for all test... in this study was 5.89 perce... the hot yield was 70.72 p...



"Putting them across the scales" ... critical handling operation. While ... are in excellent repair and have ... hogs must be turned on the scale ... through the same gateway they ... ing hogs do "on about-face" isn't ... and handlers must be alert to ... from the animals as well as ... dispositions.

age live weight of the test animals was 223 pounds a head. In table 8, the percent of shrink and hot yield and the average live weight per head are shown on the basis of rail and truck shipments related to length-of-haul.

As might have been expected, total weight shrink gradually increased as length-of-haul increased. This was accompanied by a somewhat less significant decline in hot yield. Rail shipments showed higher rates of shrink in the first two mileage groups, but shrink was much higher for truck shipments in the case of the longest length-of-haul.

In all instances, except for truck shipments moving an average of 1,425 miles, the lowest shrink was consistent with higher hot yield. In this exception noted, the average weight of the hogs in the truck shipments was a low 209 pounds, which probably explained the somewhat lower yield.

If distance were disregarded and the shipments were examined only on the basis of mode of transport, truck shipments would show 0.6 percent less shrink than rail shipments do, but only 0.08 percent greater hot yield. A review of data obtained on the 1,425 shipments slaughtered in the Midwest revealed that the percent of shrink on these shipments, all moved by truck, was 1.95 percent, and a hot yield of 71.44 percent was obtained. These shipments had an average length-of-haul of approximately 125 miles, so the lower shrink and higher yield fit into the general relation suggested in table 8.

A review of shrink and yield figures on a seasonal basis, without regard to length-of-haul, showed that shrink on rail shipments remained

TABLE 8.--Shrink and hot yield on rail and truck shipments of test hogs by major mileage grouping

Mileage group and mode of transport	Average weight per head	Shrink	Hot yield
I. 925 miles	*Pounds*	*Percent*	*Percent*
Rail	227	5.50	71.19
Truck	229	5.00	71.52
II. 1,425 miles			
Rail	223	5.65	70.69
Truck	209	4.61	68.09
III. 1,925 miles			
Rail	222	6.24	70.59
Truck	216	7.92	68.55
All distances			
Rail	223	5.96	70.71
Truck	225	5.36	70.79
All loads	223	5.89	70.72

fairly constant for all seasons of the year, with a very slight rise in summer and fall and a moderate decline in the winter (the overall range being confined to 0.78 percent). On the other hand, climate appeared to have influenced shrink in truck shipments for shrink was 7.05 percent in the summer months, 5.77 percent in the winter, and only 4.22 percent in the spring, with the fall rate 0.3 percent greater than the spring rate.

Likewise, hot weight obtained on rail shipments differed little regardless of season, ranging from 70.51 percent in the fall to 70.97 percent in the spring. As for trucks, where shrink rates were low, yields were high and where shrink was high, yields fell correspondingly. Thus, in the summer the yield dropped to 68.74 percent, while the low shrink rate in the spring was accompanied by a high yield of 72.22 percent.

Animals shipped by rail are subject to the so-called "Twenty-Eight

Hour Law," which requires that they be unloaded at a point enroute after 28 hours in transit, unless the consignor signs a release. Then the animals may remain on the cars a total of 36 hours. In almost all instances, the release is obtained, so for all practical purposes, 36 rather than 28 hours is the usual maximum time in transit without unloading.

All of the rail shipments involved in this study that moved distances greater than 1,000 miles were unloaded at least once and sometimes twice. During such stopovers, the animals were given feed and water. In addition, feed was usually spread over the floors of the rail cars, both at point of origin and at the stop enroute.

Only one truck shipment moving a long distance was unloaded for rest enroute. In only a limited number of cases was feed placed in the truck before loading. Truck shipments are not subject to the legislation mentioned above, and stops enroute for feed, water and rest are discretionary. In general, the average haul is within the 36 hour limit usually applied on rail shipments and where longer, the shipper often requests they be omitted, in the belief that the consequent lessening of total time in transit compensates for any adverse factors.

Whether or not feed, water, and rest enroute help to control shrink and contribute to higher yield cannot be positively proved. The results obtained in this study would seem to indicate that at least some salutary effect was had because rail shrink losses and hot yields obtained were considerably more favorable than those obtained on truck shipments not stopped enroute.

In a few incidents rail shipments were unloaded at a point some 8 to 10 hours travel time from final destination and held at that point from 2 to 4 days before continuing to the slaughter plant. These animals were on feed and water during this period. In the case of these shipments, shrink loss was about 1 percent less and yield about 0.5 percent higher than on shipments moving to the same destination from the same origin which did not enjoy the long stopover at the last unloading point prior to destination.

These few shipments did not provide justification for concluding that animals can quickly convert feed into effective body gains. Other conditions may have prevailed which could not be isolated by the procedures used in this study. Nonetheless, we regarded this as at least an interesting development.

Whether or not shrink constitutes an actual loss from the condition revealed in the study, or whether it is a real loss under any conditions in hog marketing practices depends on several factors. If transportation charges are assessed on the purchase or loading weight, a real transportation loss is involved, for freight is paid on meat that isn't there at the end of the journey. Generally, however, these charges are based on the delivered weight.

Then, of course, there is the amount of money paid for the animal at the time of purchase for its live weight versus the value of the animal at destination, if determined in the same way (live weight and price a pound). This represents a significant economic loss to the purchaser provided the price

been "adjusted" to allow for shrink. Whether or not such an adjustment is made probably depends market conditions prevailing at time, or more specifically, on just how bad the packer needs the hogs. Suffice it to say, shrink represents a disappearance in value (meat) and, as such, should be controlled insofar as possible.

Handling Conditions and Practices

A major objective of this study was to observe handling conditions and practices affecting the test shipments during as many of the various handling phases as might be practical. By maintaining a record of such observations and comparing them with post-slaughter observations of the animal carcasses, the possible relationship between various handling conditions and practices and loss and damage might well be established.

The degree of accuracy obtained in the previous study of cattle by FCS could not be realized in this particular study since it was not possible to identify individual animals. Identification had to be on the basis of test lots. The limitation on some of the conclusions reached on the relationship existing between handling and losses somewhat less than proven fact, but it by no means reduced them to conjecture. The various records maintained were in detail and the identification of the test animals was preserved. Where test lots were mixed or otherwise "lost," these shipments were omitted from the test data and from the analysis.

Further strength was given to the conclusions reached in this study pertaining to these loss relationships through close and thorough observation of the control shipments slaughtered in the Midwest, and extensive observation of operations at country buying stations and assembly points, buttressed in many instances by loss data on animals handled through the facilities during the period of observation.

While a major objective of the study was to establish relationships as cited above, no attempt could be made to assess blame or fix responsibility for losses on any particular segment of the industry, since it was impossible to include every handling operation and phase within the scope of the study. In addition, the only techniques practical under "field conditions" were such that any such positive assessment of responsibility would be open to challenge. Insofar as bruise injury was concerned, however, severe application of persuaders, kicking, falling and so forth were proved to be a cause of carcass bruise injury in laboratory research conducted by the Ohio State University, under contract with FCS, the results of which have been previously published.[2]

The methods used in establishing the relationship of mishandling to bruise injury were the same in this study as in the work done on cattle. The results obtained in the case of

[2] Rickenbacker, Joseph E., Biochemical Problems in Determining the Age of Bruised Animal Tissue, Service Report 42, Farmer Cooperative Service, U.S. Dept. of Agr., Feb. 1959.

cattle strongly supported the Ohio laboratory research for the record of mishandling was compatible with the record of carcass condition in 70 percent of the cases. Severe impact whether from the abusive use of persuaders or as a result of other forms of mishandling almost invariably resulted in bruising to some degree.

Two-thirds of the total financial loss due to bruising was positively identified with a "potential injury" observation. Laboratory research revealed that the various species of livestock are about equally susceptible to bruise injury from various traumas. Those associated with mishandling were positively related to carcass damage in the work on cattle. Thus we assumed that these same traumas would produce bruises on hogs.

Classifying Shipments

We maintained a detailed record of handling and the condition of equipment and facilities on each of the test shipments. In all cases, the record included the results of observations during assembly and loading at origin and unloading and yarding at destination. In some cases, this was supplemented by observations made during unloading and reloading at feed, water, and rest stops enroute. On the basis of this record, the test shipments were analyzed and divided into two general classes.

One class comprised all shipments observers had noted as being handled without any untoward incidents and which moved in equipment free from observable hazardous conditions and through facilities likewise deemed adequate and "safe." In other words, this class contained those shipments which, on the basis of observation, should have shown little or no loss or damage as a result of handling conditions and practices during the tests.

The other class of test shipments comprised those which, in the opinion of the observers, had received handling potentially able to produce loss and damage, or handled through or in defective facilities or equipment that could result in potential injury.

We decided which handling conditions and practices should be regarded as likely to result in potential injury and what facilities or equipment should be termed "hazardous" by applying standards developed in a previous study and recognizing the significance of the laboratory findings resulting from the Ohio State research, and by carefully considering information and opinions of industry leaders. In using standards thus established, the decisions reached become more than mere value judgments.

Using these standards in classifying the test shipments on the basis of the two categories indicated, we found that approximately 50 percent of all test loads fell into class 1, that is, roughly half of the total shipments were deemed to have been subjected to handling conditions and practices likely to result in injury or subjected to hazardous facilities and equipment. A comparison of rail and truck shipments showed that 70 percent of the former and 80 percent of the latter were classified in the "potential loss" category.

Some idea of the relationship between handling conditions

practices and loss and damage can be obtained by comparing the dollar and cents loss on the potential loss loads (classification 2) with the total loss on loads deemed to have been handled safely. Using this technique, we found that the total loss per hundred head on the class 2 shipments was $28.61, as against $22.43 on class 1 loads. This higher loss rate (27.5 percent) may not at firsthand appear overly significant, but projected on a total annual slaughter basis it would represent an increase in loss in excess of $6 million a year. While some may regard such a projection as an over-dramatization, at least it serves to emphasize the importance of safe handling and the elimination of hazardous conditions from facilities and equipment.

Handling Abuse

Table 9 lists the frequency of various handling abuses as well as the frequency of hazardous facilities and transportation equipment in the 211 test shipments. In a good many cases more than one abuse was noted. In some instances, there was handling abuse--plus hazardous equipment or facilities, or both. In other instances, only one condition of a potential loss-related nature was observed, but in these cases this one condition was judged

TABLE 9.--Frequency and economic significance of handling abuses, hazardous facilities, and transportation equipment defects in 211 test loads

Type of abuse of mishandling	Incidence	Percent increase in total loss above properly handled loads [1]
Excessive use of persuaders	100	23
Forcing animals to jump from decks or ramps	3	23
Animals falling from decks, ramps, or chutes due to rough or careless handling	18	29
Excessive kicking by handlers	9	92
Forcing animals to pile-up or crowd in chutes by rough or abusive handling	57	77
Rushed or hurried handling resulting in slips, catching legs in openings, or severe impact of body with part of facility or vehicle	24	69
Padding of vehicle: Inadequate, improper, or absent	14	52
Defective vehicle (harzardous)	39	21
Hazardous stationary facilities at loading, rest stops, or destination	30	31

[1] The total loss per 100 head on loads "properly handled" (no abusive handling practices or conditions observed) was used as the base for computing the percentage increase where the indicated types of mishandling were noted. Some duplication resulted since loads receiving more than one type of mishandling were included in the calculations for each type.

flagrant enough to classify the shipment as subject to potential loss and damage.

In the first series of tests, a good many shipments were handled before personnel at the various points knew exactly what was happening, and a greater frequency of handling abuse was noted. But once the word got around, it became almost impossible to say that the test shipment did not receive at least some measure of preferential handling. This resulted in some bias which ought to be considered in evaluating the findings presented here.

On the basis of observations made from overhead walkways and ramps at public stockyards and auction markets and observations made at country buying stations and concentration points, the bias accruing from preferential handling should probably be regarded as moderately significant. Perhaps an additional 15 to 20 percent of the test shipments would have been classified as potential loss shipments if ideal conditions for observations could have prevailed. If this were true, dollar and cents loss per hundred head on class 2 shipments would have increased about 10 percent.

Under the circumstances, relationship between the incidence of mishandling and hazardous equipment and facilities to loss and damage should probably be regarded as more positive and significant than indicated by this study. Loss figures pertaining to those loads in class 2 might well be considered conservative.

Table 9 shows that the abusive use of persuaders was the most common and frequent form of mishandling. This abuse occurred primarily during the loading of anim[als] into vehicles for transportati[on] either at origin point or when [re]loaded after a stop enroute. Alth[ough] persuaders were frequently used [in] unloading at destination, only a [few] cases of their use in an abu[sive] manner were reported.

Actually, there would be [con]siderably less reason for using p[er]suaders during unloading since an[i]mals will generally leave the veh[icle] voluntarily after a journey, provid[ed] the door is open, the way is cl[ear] and the unloading facilities [are] complicated in that ramps and ch[utes] are straight and the animal is [not] required to jump. For descent fr[om] upper decks of trucks or rail [cars] stair-stepped chutes seem pr[ef]able to cleated rampways.

There may possibly be some [jus]tification for using persuaders du[ring] loading operations because hogs [are] wary about entering the confin[es] a vehicle, particularly if they [must] do so by devious routes and [or] mounting steep inclines. But [many] hours spent in observing live[stock] movements lead us to assert [that] loading can be accomplished [in] many instances, without use [of] persuaders and, in the remainder [of] instances, by their occasional [judi]cious use.

Electric prods (hot shots), [rubber] sorting poles, canvas slapp[ers] whips were all observed during [the] study, but the electric prod [and] slappers were used most fre[quently]. By abusive use, we mean applic[ation] of the persuader to the animal [in] extreme force or in such a [way] to cause the animal, as a [result] sustain strong impact against [any] part of the facility or equipment, particularly rough corners, [gates] jams, or partially opened gates.

where the application of the persuader was less severe, but was of virtually continuous nature, so animals became overly excited, use of the persuader was also considered abusive. This latter use of persuaders was classified as abusive on the basis of the Ohio State research, which clearly indicated that highly excited animals were not only more susceptible to carcass damage due to bruising, but also that bruises incurred were likely to be of greater severity.

The excessive and abusive use of persuaders witnessed during this study and the extent to which such conditions occurred emphasize the importance of leaders in the livestock industry instituting training programs to properly instruct handlers in the significance of this particular problem. Much of the other mishandling was in some way related to the improper and abusive use of persuaders. Unfortunately, many handlers of livestock believe that severe applications of persuaders to animals result only in skin marks and do little or no material damage. While this is true in some cases, it is not universally so. Serious and costly damage can result because attendant excitement causes a lowering of the animal's natural resistance to bruising and, at the same time, can result in other damaging mishaps.

Programs to curtail losses from improper use of persuaders should not only be directed toward those handling animals on farms, at buying stations and concentration points during shipment, but also to those who drive the animals from holding pens to slaughter. Severe blows sustained, even seconds before slaughter, can result in carcass bruise injury with the same effect as those administered hours or even days before the animal is processed into meat.

Since one does not normally think of the human foot as a persuader, kicking animals by handlers was listed separately. In nine test loads observers noted handlers engaged in this practice. The same standards in determining abusiveness were used as in the case of bona fide persuaders. In several cases, kicking was accompanied by other intemperate actions on the part of the handler. Kicking can have the same damaging effect as the injudicious use of a sorting pole or cane. It can be especially damaging if the handler is wearing safety shoes which have steel toes. These were not uncommon, particularly in packing houses.

Hogs forced to jump from upper decks or elevated ramps or chutes, or those falling from such heights due to rough or careless handling, are especially vulnerable to severe injury. If they happen to land in a certain way, they may "spread" which results in a most severe form of carcass damage. If this occurs at the beginning of a journey, they may well die enroute, or may have to be destroyed at the outset. If they escape this fate, the impact sustained from the fall can result in severe bruising.

Forcing animals to jump was often associated with the use of stub-decks in livestock trailers where portable unloading facilities were not supplied, or the partition placed at the end of the deck could not be used as a descending ramp. The remedy for this is obvious.

In some situations height of permanent facilities used in loading or

unloading was such, that the animal had to jump rather than step from the vehicle onto the facility. This situation was more prevalent when motortrucks were used because of the lack of uniformity and positioning of the decks on the trucks. The remedy here is to use a portable chute of the proper height, to install adjustable chutes, or perhaps use specially constructed extensions which can be attached to permanent fixtures when necessary.

When animals fell from elevated ramps, the chutes or upper decks, there were usually two causes: (1) The sides of the loading facility were not properly protected, or there was a gap or open space between the facility and the vehicle; and (2) handling accorded the animals was rough, careless, and usually hurried as well. A little simple carpentry, patience, and common sense can alleviate this loss associated condition.

Rushing or hurrying animals during loading or unloading (frequently accompanied by the abusive use of persuaders) often resulted in animals slipping and falling and in severe impacts of the body with a part of the facility or the vehicle. In the case of hogs, there appeared a tendency for the ham to sustain severe bruise damage. The hind legs always seemed to catch in the smallest opening, thus causing the animal to lose its balance and fall. Extricating the leg usually entailed a good deal of threshing about, and could result in sufficient strain being placed on the leg as to bring on internal hemorrhage.

Rushing and hurrying the hogs were also major causes of overcrowding and piling up in chutes and passageways. While it may be that the animals did not suffer severe injury, there can be little doubt that they were injured by the abusive tactics often employed by handlers attempting to break the bottlenecks or unscramble the pile. On occasions such as these the foot was apt to become a persuader and bona fide persuaders were apt to be used in an intemperate manner.

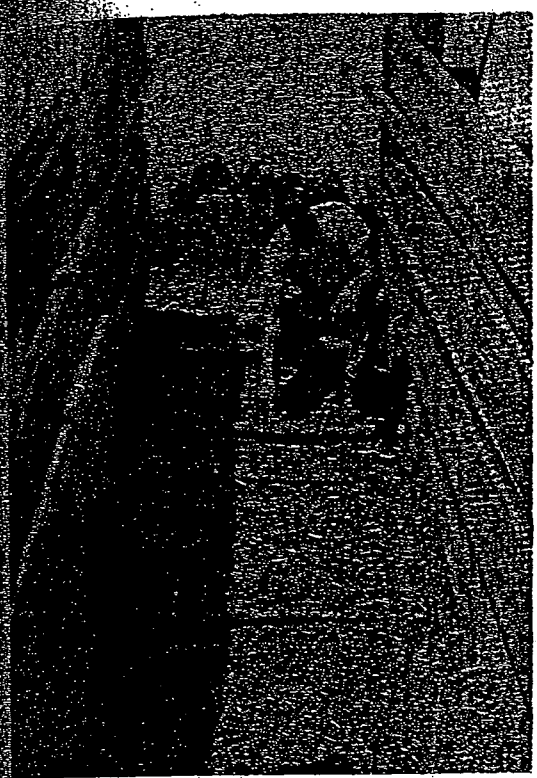
Certainly much of the loss related to the conditions just described can be eliminated by exercising patience. If the handling is careful, orderly and unhurried, slips and falls are unlikely and pileups and overcrowding can be avoided.

Hazardous Facilities and Equipment

Importance of facilities and equipment cannot be overestimated. We have already discussed certain hazardous conditions which can contribute to loss and damage--stub chutes, poorly constructed ramps, and facilities which failed to meet the requirements for which they were intended.

In general, most of the stationary facilities at the origins observed in this study were properly constructed and in good repair. However, at times shipments were loaded from a particular area at an assembly point where the facilities had been allowed to depreciate, or from an area not normally used in the handling of hogs. In these cases, an attempt was made to "make the facility" or some procedure was improvised to overcome the obvious difficulties. Unfortunately, both of these approaches usually failed.

Occasionally weather made normally satisfactory facilities



dated facilities can exact a toll in losses times the cost of replacing them or bringing them to a good state of repair. This loading with its broken and worn cleats, split tered sides, protruding nails and bolts, weak sagging dock demands that the use care almost "beyond the call of to move hogs safely through. The hazards be materially lessened with a hammer, few nails, and a little lumber but a overhaul or complete replacement will sary to effect really lasting and satisfactory improvement.

ardous. This was particularly during the winter when ice and were present, and during other when rain slickened the Obviously, applying mateigned to provide better footexercising additional care in could overcome much of the danger.

Modifying facilities to conform with prevailing equipment specifications (particularly ramps and chutes used in loading and unloading) and using protective materials during inclement weather should minimize or eliminate the majority of hazardous conditions in stationary facilities at most hog concentration centers.

Selecting and applying proper bedding are particularly important in the safe movement of hogs. In all species of livestock, proper bedding is somewhat a safety factor because it can be used to provide good footing. This is important not only during loading and unloading but during the over-the-road trip as well since swaying and lurching of the vehicle can result in animals slipping and falling. They can sustain impacts of sufficient strength to cause bruise injury.

The physiology of swine is such that bedding may have considerable influence on body temperature or other physical factors which, in turn, could be related to losses. Thus, during the summer, using damp sand may have a cooling effect, which would be beneficial. During the winter, a bedding of straw on top of dry sand would promote warmth. These were the only two materials used as bedding in vehicles transporting the test shipments. Observations made at stockyards and country buying stations during the study, however, showed that sawdust, wood shavings, and a mixture containing a considerable amount of ground corncobs were also frequently used in bedding motortrucks.

In all but two instances rail cars were supplied with bedding of some sort--generally sand. A few cars had inadequate bedding. If the hogs

"changed cars" at a rest stop, the new car was, in every instance, freshly bedded. Where the same car was used to destination, additional bedding was added where needed, in most instances.

While most truck shipments were also properly bedded, on several occasions the top deck was left bare. The excuse for this was that "the sand sifts through anyway so there isn't any use to put it up there." Because swaying and lurching are somewhat worse in the top deck and because this portion of the vehicle is more difficult to load, livestock haulers should feel it incumbent to make whatever changes are necessary to bed upper decks properly and eliminate the loss of the bedding during the over-the-road trip.

The vehicle itself can also have some relationship to loss and damage if conditions present could cause injury in and of themselves, or if the condition could help create a hazard. The most frequent safety defects encountered during the tests, on rail shipments, were broken side slats with sharp points left hanging inside the car; floors that were buckled and worn, or in which there were holes; badly leaking roofs which would allow rain to come into the car in such quantities as to cause sloppy bedding; and rough or splintered bulkheads and sides. In one or two cases the upper deck was supported by wooden posts set in the car where animals could be thrown against them during movement.

Major defects, insofar as trucks were concerned, were rickety upper decks, improperly fitted, so that legs slipped between the boards of the flooring or between the deck and the side of the vehicle and end gates framed by open channel irons.

As in the case of facilities, the majority of hazardous conditions in transportation equipment were such that minimum cost and effort could eliminate most of them. The shipper can control this situation either by his selection of the carrier or by insisting that only equipment in safe condition be offered for the movement of his animals.

Conclusion

All of the loss figures developed in this study indicated that loss and damage associated with transportation and handling was higher than it had generally been assumed by most of the industry. Controlling these losses is not an insurmountable problem. Not one of the abuses or hazards listed requires the expenditure of large sums of money to correct, although many will take time. The most difficult job is convincing livestock handlers of their importance in loss control and in not only educating them, but creating in them a genuine desire to give their livestock careful handling.

This is not just a job for [illegible] or for transportation agencies, marketing agencies, or for [illegible]. It is a job for the entire industry because loss and damage is an industrywide problem. Finding an effective solution to the problem will benefit every segment of the industry.

★ U. S. GOVERNMENT PRINTING OFFICE

ATTACHMENT 7

DEPARTMENT OF AGRICULTURE
OFFICE OF THE SECRETARY
WASHINGTON, D. C. 20250

A RESEARCH PROGRAM TO REDUCE LOSSES DUE TO TRANSPORTATION OF LIVESTOCK

Report to the Congress
(Pursuant to Section 809 (b)
of Public Law 93-86)

MAY 1977

Prepared by:

Agricultural Research Service

CONTENTS

BACKGROUND

Estimated livestock transportation related losses for 1973 were $15.2 million from dead and crippled animals, $46.1 million from carcass damage (excluding grubs) and "shipping fever" death losses and medication costs (for cattle only) of $102 million. In addition, part of the $110 million losses from carcass condemnation are transport related.[1] The major transportation related loss however is from morbidity (sick animals not responsive to feed after transport). These losses are hard to evaluate and it is difficult to determine actual cause and effect relationships. Estimates of morbidity losses range from five times measurable losses to as much as $1 billion per year. Also, not included in these loss estimates are data on air transport and on laboratory or other animals.

Livestock transportation has changed significantly from the turn of the century when livestock were hauled by railroad from western producing areas to the Midwest and East Coast cities for slaughter. Slaughter plants have moved closer to the producing areas; however, the livestock business has segmented into specialists who produce breeder cattle, cow-calf operators, intermediate feeders such as on wheat pasture, feedlot operators and others. Cattle being shipped are younger and may move several times from Southeast or Midwest cow-calf operations to auctions, pastures and feedlots. Almost all transportation is now by truck. A. T. Kearney, in an ARS contract study, said in 1969 "precise data on the amount and type of transportation of cattle and calves from birth to slaughter - are not presently available, however, information gathered - indicates that such movement is probably more extensive than necessary."[2]

Livestock transportation by air is a recent development due to a rapidly growing export market for U.S. breeding stock. Air transport while expensive does deliver the animals quickly and in good condition to distant markets if all goes well.

Livestock transported by truck often becomes ill or die. Some animals are injured in transit but many problems are related to respiratory or enteric diseases. Diesel fumes are often cited as a possible cause of trouble. Losses on shipments by aircraft are most frequently attributed to asphyxiation or excessive heat in confined quarters.

"Shipping fever" has been a threat to the industry for many years, but has assumed greater dimension as a result of the development of a concentrated feedlot approach to management. Thousands of animals died the winter of 1972-73, and many more were poor converters of feed. Losses

1/ Source, Livestock Conservation Inc.

2/ Feasibility of a Physical Distribution System Model for Evaluating Improvements in the Cattle and Fresh Beef Industry, ARS-52-36, November 1969, prepared under contract by A. T. Kearney and Company, Inc. for the Agricultural Research Service, USDA.

of live animals being exported by aircraft became a serious problem in 1973. Problems in the shipment of pets and other small animals by air was the key issue in the Congressional Hearings associated with the Foley Bill, HR 15843 superseded by HR 16738.

The clinical problem of respiratory diseases usually results from infection by more than one infectious agent, i.e., infectious bovine rhinotracheitis, parainfluenza and pasteurella have been incriminated as causal agents. Stress factors related to transportation appear to enhance the development of the clinical disease.

The clinical signs resulting from the stress and infections are usually respiratory or enteric in nature, and clinical symptoms include elevated temperature, depression, and loss of condition. Livestock assembled from small cow-calf operators in the Appalachian and Southeastern Region are usually thought to be more susceptible than animals taken in full truckload lots from single farms. Animals taken too young or improperly preconditioned apparently are also especially susceptible. Affected animals often die several days after delivery or remain ill and therefore are poor feeders with slow weight gain.

Losses in shipment by aircraft are usually attributed to improper handling procedures by the aircraft operator. Losses relating to trucking operations may be affected substantially by handling of the animals prior to and during assembly.

One of the primary research needs is to establish good loss data on this phase of animal production in order to prescribe and encourage necessary changes.

LEGISLATIVE HISTORY

In 1973, a bill sponsored by Senator Bellmon of Oklahoma became Section 809 of the 1973 Farm Bill. This section specified that research should be conducted on losses of livestock being transported and that the U.S. Department of Agriculture should submit reports to Congress each year with a final report in not more than 4 years. Funds were authorized but not appropriated for this purpose. A proposed appropriation of $500,000 in the Senate version of the FY 1974 supplemental appropriation was dropped in the conference committee with instructions to the U.S. Department of Agriculture to conduct the research with existing funds. At that time the Agricultural Research Service had a relatively small program to study enteric and respiratory diseases of cattle as related to transportation losses. ARS also had one small engineering project at Beltsville, Maryland, involving design of crates for shipment of small animals by air.

In FY 1974, $150,000 was appropriated for animal respiratory and eric disease research at Ames, and in FY 1975, an additional $242,000 appropriated for the same purpose. No increased support for transrtation research was provided either year.

In the FY 1976 budget, $150,000 was provided for livestock transrtation research at College Station, Texas, and Beltsville, Maryland. so $133,000 was appropriated at El Reno, Oklahoma, for research on imal health and management of young cattle going to winter wheat sture and $133,000 at Bushland, Texas, for animal health and manageent of young cattle going into feedlots in the Southern plains.

In FY 1977, an additional $78,000 was appropriated for the Livestock ransportation Engineering Research at College Station, Texas. Meanwhile, response to the encouragement of the Congress, between FY 1973 and FY 977, ARS transferred to livestock transportation research approximately 174,000 taken from other important research programs. In addition, pproximately $95,000 has been transferred to livestock management as it elates to shipping fever and transportation and $833,500 has been transerred into enteric and respiratory disease research. The currently funded rogram includes/$1,345,500 in disease research, $360,600 for livestock mangement and $401,900 for transportation research that in some way deals with ivestock transportation or "shipping fever" problems for a total of 2,108,000.

Of this sum, $494,000 was appropriated under the authorization of ection 809. Other research conducted under this package involves a wide ange of problems including disease identification and prevention, livetock management and handling, disease eradication and livestock transporation both domestic and overseas, and by surface and air modes. While his program extends beyond the scope of Section 809 of the 1973 Farm ill and many of the research projects deal with other problem areas, ome of the research findings are expected to contribute to solving the roblems identified in Section 809.

This research package should be adequate to conduct the needed esearch spelled out in Section 809 with one notable exception. From esearch conducted to date and from discussions with the livestock and ivestock transportation industry, it has been determined that the probems of livestock stress, especially those related to confinement during ransport, are significant in transport-related livestock losses. The xisting research to determine livestock physiological requirements in onfined spaces is inadequate to answer many of today's questions.

The transportation industry dealing with air transport of live nimals has pointed out that the USDA standards were developed for longerm confinement and are unrealistic for economical livestock transport.

Agricultural Research Service
Research on Livestock Transportation,
and Enteric and Respiratory Diseases

Location	SY's			Dollars		
	FY 75	FY 76	FY 77	FY 75	FY 76	FY 77
Beltsville TPRL - Exports	.4	.8	.5	19,589	36,900	43,800
Beltsville APML - Facilities	0	.8	.8	0	42,000	44,400
Beltsville MORL - Transport	.3	.5	.2	14,993	28,900	14,300
Beltsville Ag. Eg. L. Trans. Dis.	1.0	1.0	1.0	56,932	69,100	71,000
Col. Sta. Tex. - Trans. Feed Cattl.	.8	1.8	2.0	62,988	164,200	228,400
Columbia, Mo. - Environment	.2	1.1	1.1	7,948	61,400	70,300
Ames-NADC-SCOURS	4.1	4.6	4.4	572,884	580,300	624,700
Ames-NADC-Respiratory	2.2	3.8	5.1	275,000	593,700	720,800
El Reno - Disease Control		2.0	1.0		133,000	156,800
Bushland-Disease Control			1.1		133,000	133,500
Knoxville-Livestock-Mngmt.	9.0	16.4	17.2	1,010,334	1,842,500	2,108,000

The industry has requested the ARS to conduct research to determine environmental requirements for various species, size and type of livestock in the "aircraft environment." Similar studies are needed for surface transportation. Such stress-related research would require resources not presently available in ARS or the SAES.

Prior to FY 1976, ARS has held a number of meetings and conferences dealing with problem identification in livestock transportation. However, since FY 1976 was the first year funds were appropriated under the authorization of this Act, ARS is providing this report as the first annual report of research results under the Congressional directive. This first year's program was largely organizational. In fact, the first full-scale research shipments of feeder cattle under this project took place in October 1976, after the transitional quarter and officially in FY 1977.

CURRENT AGRICULTURAL RESEARCH SERVICE PROGRAM IN LIVESTOCK HANDLING AND TRANSPORTATION RESEARCH AND RELATED LIVESTOCK DISEASES

The current effort largely concentrates in two major areas: livestock transport by truck and air transport of livestock.

The research is designed to determine the environmental conditions of the animals in the actual assembly, transport, and post-transport phases, to determine the animal's response to these conditions and to develop improved facilities, equipment, and handling procedures in transit and before and after transit.

All the projects are interrelated and research findings from one help support others. Industry cooperation is an essential part of this research since many of the tests are conducted in actual marketing systems.

SUMMARY - TRUCK TRANSPORT

This research is conducted with funds first appropriated by Congress in FY 1976. The total research effort is strengthened by integration of the new effort with ongoing programs related to respiratory diseases.

The research is with feeder cattle shipped from one geographical location to another either for grazing on wheat pasture or for immediate feedlot finishing.

The research includes:

1. Observations on the farm of origin (mostly Tennessee or Alabama).

2. Application of treatments such as early weaning, grain feeding, etc., before leaving farm of origin.

4) Observations at local sales yards and imposition of treatments such as long or short periods in the yards, feeding variables, antibiotic treatments, etc., while in the yards.

5) Observations on both cattle and the environment to which subjected during transport.

6) Observations at feedlot or pasture destination.

7) Studying all observations and treatments prior to delivery at destination as regards to their effects on or relations to performance at destination. Major criteria used for evaluations at destination include incidence of sickness and death losses, and rate and economy of gain during the feeding period.

In the foregoing listing the word "observations" covers clinical evaluations of state of health, microbiological and biochemical examination of appropriate body fluids, indicators of stress such as heart and respiratory rates, environmental temperatures, sampling of air for pollutants, and body weights. Not all observations are made on all cattle.

Activation of research on this geographically dispersed basis requires the cooperation of feeder cattle producers, sale yard operations and feeders in addition to publicly supported institutions.

The research program is organized as a team effort under the leadership of Dr. Will Butts, Knoxville, Tennessee. The research involves cooperative efforts of USDA's research units and personnel at Ames, Iowa; El Reno, Oklahoma; Bushland, Texas; College Station, Texas; Knoxville, Tennessee; Beltsville, Maryland; Columbia, Missouri; the Tennessee, Oklahoma, Texas, Missouri and Oregon Agricultural Experiment Stations; and Agricultural Extension Service in Tennessee, Oklahoma and Texas.

Most of the necessary preliminary-information gathering is complete, and the bulk of the research equipment has been purchased and pretested. Animal procurement arrangements have been completed and full-scale research studies are underway.

To date, 425 cattle have been transported and observed under the program plus some 15 loads of industry cattle and the plans are complete for transporting and observing 700 more cattle plus about 30 loads of industry cattle during the next year.

The effort has elicited much favorable response in industry circles as the attached eight-page report on the project carried in the January 1977 issue of BEEF indicates. (appendix)

One additional project, at the request of APHIS, involves hauling livestock in closed transport vehicles with filtered air circulation to prevent spread of potential disease. This development would permit transfer of

potentially diseased animals from a quarantine zone to slaughter plants under APHIS control as a means of salvaging animal products during a depopulation emergency.

SUMMARY - AIR TRANSPORT

ARS research on air shipment of live animals began in the mid 1960's when this method of transport began to develop. Early research centered around pens and crates that were carried on aircargo pallets. The pens had to be light yet strong enough to contain and protect the animals. ARS developed or tested materials and containers that farmers could obtain locally. Wooden turkey crates for instance work well for pigs. Recent research includes traveling with overseas shipments of livestock to obtain information on stress producing factors. Temperature, relative humidity, air pressure, air quality and amount of air circulation within the pens are measured during flight. The animals are observed for their physiological reaction to handling, overcrowding, lighting and they are observed for several days after the flight for latent signs of injury and stress.

Physical facilities and equipment for handling the animals in the aircraft and on the ground are studied and improved. ARS engineers have developed criteria for ground handling facilities at export airports and are conducting a series of tests to determine shrinkage and waste production of various livestock under air shipment conditions and minimum space and environmental requirements for animals during the flight period. Future research will concentrate on ways to reduce handling stress, more complete space requirements for different size animals within each species and reducing shrinkage rates.

The research is conducted at Beltsville, Maryland, and Columbia, Missouri, and is coordinated with the ground transportation research where necessary. The program is conducted in cooperation with the Foreign Agriculture Service and the Animal and Plant Health Inspection Service which also provides financial assistance.

INDIVIDUAL LIVESTOCK HANDLING AND TRANSPORTATION RESEARCH UNIT PROGRESS REPORTS BY LOCATION:

Beltsville Agricultural Research Center - Transportation and Packaging Research Laboratory, (Transport Livestock Overseas)

Objectives:

To develop basic information on the handling procedures, equipment, and environmental conditions required to assure safe delivery of livestock by air to overseas markets. To develop, evaluate, and demonstrate improvements in equipment and handling facilities and techniques necessary to reduce losses and improve efficiency of the operation.

Progress:

U.S. air carriers are purchasing jumbo jets to transport the rapidly increasing number of livestock marketed overseas. To minimize animal heat stress, planes are equipped with extra air-conditioning units and an auxiliary power unit for continuous cooling. At Beltsville, a modular three-deck pen with mesh-type floors was used to study handling, density, waste collection, environmental cleanup problems of transporting sheep via air.

Researchers accompanied one mixed plane load of 35 Angus Heifers and 321 hogs to Korea, obtaining data on the temperatures, relative humidity and air circulation maintained in the aircraft cabin during transit. Information on other handling factors contributing to transit stress also was obtained. Another air shipment of 82 Holstein Heifers was accompanied to Tehran, Iran. In addition to the environmental factors aforementioned, data on concentrations of ammonia and carbon-dioxide gases were obtained.

An air shipment of 550 swine from Minneapolis-St. Paul to Kaohsiung, Taiwan, was monitored to determine cabin air velocities, temperature, relative humidity and gas content. The swine were observed from the barns in Minneapolis and Wisconsin to pens in Taiwan. The total mortality was two animals on the trucks from the farm to the airport and two after one week in quarantine (.7% total).

Studies were conducted to determine rabbit sizes, fighting characteristics, clawing and chewing habits and to develop container specifications for shipment. One shipper is successfully using these containers to send rabbits from the Midwest to Japan.

Plans are being developed for a facility at Beltsville for studying and improving animal transportation equipment and systems. This building will be adjacent to and complementary to the new packaging laboratory.

Publications:

Ashby, B. Hunt and John R. Langridge
Transporting Livestock Overseas by Air
ARS-52-38, August 1970

Ashby, B. H. and T. F. Webb
Needs for Improving Livestock Transportation and Handling Facilities
Journal of American Society of Agricultural Engineers, 1975

Ashby, B. H., W. A. Bailey, ARS and J. J. Sushko
Seaboard World Airlines
Design Criteria for Aircargo Systems for Sheep, 1976

Beltsville Agricultural Research Center - Animal Products Marketing Laboratory (Improved facilities and handling methods for loading and transporting livestock)

Objectives:

To develop more efficient assembly and loading facilities and handling methods for use in surface and air shipment of livestock.

Determine criteria for designing an efficient livestock export inspection facility that meets animal welfare requirements as set forth in APHIS regulations.

Develop layouts for livestock assembly and inspection facilities conforming to APHIS regulations.

Progress:

Field data on auction marketing operations in the Appalachian area were completed. Analysis of these data indicate that the major cause of inefficiency is the taken practice of weighing livestock on arrival at the market. This practice requires substantial redesigning of the market facility, and criteria for improved layouts were investigated. The layouts, when finalized, will correct existing defects which have resulted in substantial delays at the receiving docks, congestion and delay in the weighing operation, mixups in animal ownership caused by poor facility arrangements which results in errors in receiving and weighing records, congestion and crossflows in moving animals within the market facility, and relatively high labor requirements and costs.

Data were collected, a manuscript prepared and published on animal export inspection facilities. This work was done at the request of the Animal and Plant Health Inspection Service and provides recommendations concerning the general facility layout, truck docks, scales, alleyways, holding pens, fences, [illegible] inspection area, cleaning, lighting, feed storage, maintenance and office areas. Several alternative layouts are provided to accommodate different volumes and handling situations. The primary purpose of the study was to provide for the efficient and economic care, welfare, and safety of the animal while being processed for overseas shipment.

Publications:

Mayes, H. F. and T. T. Webb
Animal Export Inspection Facilities
AES-NC-44, May 1976

mbia, Missouri

ctives:

To evaluate parameters associated with transport and handling of estock. Criteria are needed to guide engineers and others associated n designing and using livestock handling and transporting equipment: rent guidelines based on livestock production systems are inadequate.

proach:

The experimental and operational plans are to use miniature radio lemetry equipment to monitor and record heart rate and body temperature. ood hormone tests will be used to verify telemetry data. These data ll be taken during the loading and unloading from transport trucks, handling and testing, and the selling of swine. From these data, reas of stress on swine will be identified, and by improving work thods and procedures, these stress areas will be reduced or eliminated.

In the Climatic Laboratory and related controlled-environment cilities, tests are planned to determine the "shrink" and waste oduction of swine at elevated air temperature and humidity combina- ons. Tests are also planned to determine minimum ventilation rates sheep based on limiting factors other than latent heat exchange .g., CO_2 levels, etc.)

ogress:

A new CRIS Work Unit relating to livestock marketing was initiated rch 9, 1976. Livestock transport studies continued by monitoring ound and air shipment of swine and by evaluating waste production, dy weight "shrink" and body temperature of fasted sheep during 48-hour riods at 21°, 28° and 35°C (40, 75 and 90% RH at each temperature). e sheep "shrink" tests indicate the following: (1) rectal temperature significantly elevated in sheep at 35°C within 3 hours and within 24 urs for sheep at 28°C (regardless of humidity level); (2) urine and al waste production were significantly higher at 35°C (regardless of midity level) by the start of the 7th hour and remained so for the st of the 48-hour period.

blications:

Meyer, R. E. and T. T. Webb
Animal Waste Transportation Facilities
ARS-NC-44, May 1976

Knoxville, Tennessee - (CRIS Unit to be developed)

Objectives:

To develop information on the response of calves assembled for transport to Oklahoma wheat pasture or Texas feedlots. The project will be multidiscipline in nature and will involve Federal-State cooperation.

This Project is funded from College Station, Bushland and El Reno. It includes overall team leadership and cooperation work with the Tennessee Experiment Station in assembly of calves.

Publications:

None

College Station, Texas - Determine Adverse Environmental Conditions to Cattle During Transit from Farm to Destination

Objectives:

Determine the relationship of adverse environmental conditions to various types of sickness such as shipping fever and other causes of loss and damage, including bruising, crippling, death and condemnation associated with transportation and other handling conditions and practices prevailing in the movement of livestock from farms and feedlots to initial destinations and processing plants.

1) Develop information on present shipping methods to determine if present techniques need to be modified.

2) Determine environmental factors imposed on cattle while in transit from producing area to destination.

3) Develop data on motor truck transport equipment to determine contributing causes of bruising, crippling, death, and condemnation attributable to this mode of transport.

4) Monitor vital signs (temperature, pulse, and respiration) of animals using biomedical, radio telemetry equipment to determine physiological parameters.

5) Determine the presence and the amount of noxious fumes from the transport vehicle and other highway conditions.

determine the effects of acceleration, deceleration, and vertical vibration of the rear of the trailer, as well as, the side-to-side motion of the animals.

define the environmental conditions and the immediate effect on temperature, pulse, respiration of the animals, as well as, a possible latent effect on the animals' health and performance in the feedlot.

ress:

One shipping test was made from Lexington, Kentucky, to Bushland, during April 1974. This test was made to determine animal behavior ime of loading, in transit and unloading. In addition, researchers mined the time requirement for wiring livestock trailers necessary btain environmental data and problems that would be encountered when g complete experimental shipments. All thermocouple and electrical cannot be left exposed from the overhead or sides where the cattle ee them because the animals will try to eat them. Minimum of two working together can fully instrument the trailer in eight hours complete experimental shipments. No additional tests were made e the mobile van to be used in this work was not delivered until ebruary 1975. Some of the equipment needed for this project is on r.

After distribution of funds in mid-December 1975, an agricultural neer and an electronics technician were hired. Equipment is on r to equip an electronics laboratory and a research and development tract is being negotiated for the biomedical telemetry system to be d in monitoring animal vital signs while enroute from producing area estination (feedlot or wheat pasture). Research objectives and odology, for the regional livestock study, are being worked out een the research leaders at the four locations (Bushland, Texas; ge Station, Texas; El Reno, Oklahoma; and Knoxville, Tennessee) lved in this project.

ntations:

Camp, T. H.
Report on Cattle Transport Research.
Livestock Air Transport Seminar, Beltsville, Maryland, October 1975

itations to Speak:

Annual Meeting of Livestock Conservation, Inc. at St. Paul, Minnesota, May 17-20, 1976.

...ing:

...ll

...ville Agricultural Research Center - Market Operations Research ...ory (Evaluation of systems and environment for feeder livestock ... shipment from producing areas -- Cooperative with College ...on, Texas)

...ctives:

Define environmental conditions and their effect on feeder calves ... auction to feedlot and determine operating practices and costs in ... eastern States in assembly of calves from small cow/calf producers ... shipment to Southwestern feedlots.

...ress:

Basic information relative to this research project is being obtained ... cooperative arrangements to complete this project are being finalized. ...metric equipment and a mobile laboratory are being assembled along ... a diverse team of specialists from the entire Nation.

...eno, Oklahoma - Southwestern Livestock and Forage Research Station ...RIS 7316 20420-001 Reduction of Losses Due to Stress and Respiratory ...ease in Transported Beef Calves)

...ectives:

Develop "stress index" and evaluate management techniques proposed ... reduce stress during transport of calves.

...ogress:

This research was first funded in FY 1976. Much of the first year ... spent planning research and coordinating activities to insure maxi- ...mum impact of interregional studies of calf movement from the South- ...western U.S. to the wheat pastures and feedlots of the Southern Great ...Plains. A staff vacancy to support this WRU has been filled, and minor ...difications to the physical plant have been carried out. Five loads ... cattle were identified at origin and studied throughout the transpor- ...tation process during the 1976-77 wheat-grazing season.

...esentations:

... Texas Beef Conference at Amarillo, Texas, April 7-8, 1977
Annual Meeting of Livestock Conservation Institute at Columbus, Ohio, May 10-12, 1977.

lications:

Phillips, W. A., R. P. Wettemann and F. P. Horn
Research program to identify factors related to respiratory disease losses in the transportation of feeder calves.
In: Beef Cattle Research, Okla. Agr. Exp. Sta. Res. Rept. P-742, Oct. 1976.

Wettemann, R. P., F. P. Horn, T. W. Beck and J. L. Drew
Evaluation of a stress index for the study of shipping fever in stocker cattle.
Okla. Agr. Exp. Sta. Misc. Pub., April 1977.

Bushland, Texas, USDA Southwest Great Plains Research Center (CRIS Unit to be developed)

Objectives:

To develop information on the response of calves in Southwest feedlots after various transportation treatments. A multidiscipline approach will be used incorporating animal and veterinary sciences and will involve Federal-State cooperation.

Progress:

The project is still in the planning stage with data collection scheduled to begin in October. Progress to date has been limited to recruiting personnel, planning the project, seeking industry cooperation, and construction of feedlot facilities. The planning has been in cooperation with ARS units at El Reno, Oklahoma; College Station, Texas; Ames, Iowa; and the State Agricultural Experiment Stations of Tennessee, Texas and Oklahoma.

OTHER PROJECTS CONTRIBUTING TO LIVESTOCK TRANSPORTATION

Beltsville Agricultural Research Center - Agricultural Equipment Laboratory - (Modification of trucks to contain diseases of potentially infected animals)

Objectives:

To develop methods to haul potentially infected animals through nonquarantine zones to slaughter facilities in support of APHIS protein conservation program.

Progress:

This report describes the progress made in the first year of research. Since the research is to determine means of modifying an enclosed trailer

so animals could be hauled in them, an enclosed trailer was leased and moved to Beltsville Agricultural Research Center. Literature was searched to determine how much air would be necessary for the animals during transit. A ventilating system to provide this amount of air was designed and constructed. One of the rear doors of the trailer was removed and the ventilating system installed in a plywood panel covering the door opening. A method of sealing the van to contain animal wastes was designed and installed. Articulated plywood panels were placed around the walls to protect the seal. A duct was installed leading the entering air overhead to the front of the trailer. An exhaust air-filtration system was designed to contain particles the size of disease pathogens in the trailer. This was installed ahead of the outgoing air. The trailer was loaded with cattle three times. An increasing number of cattle placed in each time until the trailer was completely loaded. The cattle were held there for two hours while the interior temperatures of the trailer were measured. Between each loading, changes were made in the system. The airflow was redirected down between the cows. In addition, the plywood pens were removed as they were too hard to clean. An electric motor was added to operate as a standby unit when refueling the gasoline motor. It can also be used as a standby unit while repairs are being made on the gasoline engine or belt. The airflow and distribution were measured.

Publications:

James, Paul E.
Modifying Enclosed Trailers to Transport Disease-Exposed Cattle
ARS-NE-80, April 1977

Ames, Iowa, National Animal Disease Center - Methods for the Control of Respiratory Disease of Cattle (The pathogenesis and immunobiology of respiratory diseases of cattle)

Objectives:

Research activity efforts are directed toward the determination of the causal relationships of microbial, physiological and environmental influences on the bovine respiratory disease complex. The isolation, characterization, and the determination of pathogenicity of viral, bacterial, mycoplasmal and other microbial agents as primary concert pathogens are integral parts of such activities. The mechanisms of resistance to disease and their subsequent modifications due to stress, nutrition and other factors are being evaluated. This WRU directs its research effort toward determining the role of antibody (humoral and secretory), cell mediated immunity and other resistance factors of cattle in response to bovine herpesvirsues, parainfluenza-3 virus and bovine enterovirus infection. The change in these immune mechanisms due to chemically induced stress is given major consideration. The experimental findings and methodology are widely disseminated and adapted by other investigators under this RA in other locations.

Program:

National Animal Disease Center

1) Determine the role of cell mediated immunity (CMI) in acute and chronic IBR infections by examining the blastogenic responses of lymphocyte cultures from exposed cattle. Radioactive tritiated thymidine uptake in DNA will be measured following exposure to phytomitogens and specific IBR immunostimulation during acute, chronic and chemically induced recrudescence of infections. (The change in CMI soluble mediators will also be evaluated using the same techniques).

2) Investigate the presence of bovine and interferon in tissues and body secretions during acute and chronic viral infections.

3) Compare several bovine herpesvirus isolates with other than IBR by serological, morphological, and biophysical techniques to determine identification and classification criteria.

4) Evaluate clinical and immune response of cattle by different routes of exposure to PI-3 virus (field strains and mofified live virus vaccines).

Oregon State University

1) To determine the incidence of adenoviral infection in cattle which are showing signs of respiratory disease.

2) To determine the pathogenesis of infection with selected bovine adenoviruses.

3) Serologically classify adenoviruses isolated from respiratory disease outbreaks.

Auburn University

1) Determine the incidence of bovine respiratory syncytial virus (BRSV) induced acute respiratory disease in cattle.

2) Improve methods for diagnosis of BRSV infection in cattle.

University of Missouri-Columbia

1) To classify bovine rhinoviruses isolated from field cases of acute bovine respiratory disease.

2) Determine the capacity of different bovine tissues to produce interferon.

3) Evaluate the role of bovine interferon to protect against heterologous respiratory viral infections.

North Dakota State University

1) Determine the probability of latent IBR postvaccinal infection and possible route of elimination of IBR virus after vaccination.

2) Determine the magnitude and persistence of postvaccinal serologic IBR titer.

Progress:

Summary for Journal Publication:

Cellular [illegible] were evaluated during chemically induced reactivation of [illegible] IBR infections in cattle. Preliminary results support the hypothesis that there are two subpopulations of T-lymphocytes that vary in their susceptibility to dexamethasone treatment. The response of interferon [illegible] and B- and T-lymphocyte ratios during dexamethasone treatment generally suggest that chronic infections are maintained by cellular immune mechanisms.

Reactivation of clinical signs of disease and secretion of IBR virus in nasal mucus could be elicited by dexamethasone treatment in animals exposed to IBR by the carnal route, whereas exposure by intramuscular injection to a similar dose of IBR failed to establish chronic injections that could be determined by the same techniques. Both groups of animals were immune to aerosol challenge with IBR virus. The role of a bovine [illegible] isolated in high titer from a pneumonic lung of a dead calf with histopathologic [illegible] in association with enzootic calf pneumonia was investigated to [illegible] role as a primary pathogen. Aerosol exposure of normal and immunosuppressed, colostrum-deprived [illegible] failed to cause overt clinical disease even though virus was isolated from [illegible] animals for periods up to 12-days post-exposure.

[illegible] months of age were exposed to [illegible] by the intranasal inoculation. [illegible] techniques was used to evaluate [illegible] and humoral (IgG and IgM) antibody responses related to [illegible] challenge with homologous strains. Preliminary results indicate that there is no marked difference in the ability of the PI-3 virus strains tested to elicit NSa, Ha or resistance to disease.

ultured lymphocytes from acute and chronically infected bovine
racheitis (IBR) infected cattle were evaluated in their response
ecific IBR and phytomitogens. Corticosteroid treatment caused
ificant changes in T-cell responses during recrudescence of clinical
of the disease. These results indicate that T-cell lymphocyte sub-
ations may differ in their role in resistance mechanisms important in
ic IBR infections. Vaccine and field strains caused similar clinical
se when inoculated into calves by comparable methods and caused similar
ical signs when the infections were recrudesced with corticosteroid
ent.

Young adult ferrets were infected with IBR virus by the respiratory
intraperitoneal routes. Respiratory disease manifested by difficult
thing due to an acute exudative rhinitis and pharyngitis was pro-
d in ferrets. IBR virus was recovered from pharyngeal swabs and
iratory epithelial tissues. Infected ferrets developed IBR anti-
es similar to those found in infected cattle. Chronic infections
d be recrudesced by the intraperitoneal injection of corticosteroids.

Seven different bovine herpesviruses mixed with adjuvant were injected
goats. Fluorescent antibody, double diffusion in gel and plaque reduc-
virus neutralization tests were developed to assay and compare the
logic relationships of this group of viruses.

Three different strains of bovine respiratory syncytial viruses were
ected into neonatal colostrum deprived calves. The clinical and sero-
ic responses were compared.

Colostrum-deprived calves reared to 6 months were exposed to parain-
enza-3 virus (vaccine and field strains) by intranasal inoculation.
osal challenge exposure by established techniques was used to evaluate
al secretory (NSa) and humoral (Ha) antibody response related to resist-
e to challenge with known pathogenic strains. Results indicate that
re is no marked difference in the ability of the PI-3 virus strains
ed to elicit NSa, Ha or resistance to disease.

mary of Progress for Extramural Projects:

role of adenoviral infections in respiratory disease of cattle,
[illegible]-204-A, Oregon State University

Serological studies were conducted to determine the test system of
ice for measure response to adenoviral infection in cattle. The in-
rect hemagglutination test appears to be the most sensitive indicator
infection. Primary bovine testicular cells proved to be the cell
ture of choice for microserum virus neutralization tests.

Bovine adenovirus type 3 was isolated from two herds of cattle with febrile disease and signs of respiratory tract infection. Type 2 bovine adenovirus was isolated from 2 other calf herds as latent virus infections but both herd owners reported serious outbreaks of enzootic calf pneumonia.

Pathogenicity studies of bovine adenovirus type 3 infections in neonatal calves indicated that very young calves exhibited a more pronounced febrile response, microscopathologic change, and viral shedding from secretions than older calves. Fluorescent antibody examinations of the intestinal and respiratory epithelium and associated lymph nodes demonstrated pronounced widespread viral replication in these tissues.

Studies of bovine adenovirus type 4 infection indicates that this agent causes viremia and replicates in endothelia cells. The full significance of these differences in tissue tropisms of the two types cannot be fully evaluated at present.

Close serologic relatedness was noticed between all Oregon bovine adenovirus type 2 isolates and USA strain 5C and the English strain WRR1. The type 2 isolates in Oregon appear to be related to the Mahaffy strains.

The virology of bovine respiratory disease of cattle, 3090-11521-003-..., Auburn University

Serological investigations showed that 67% of the healthy adult cattle tested had antibody titers to bovine respiratory syncytial virus (BRSV). Calves in herds with respiratory tract disease subsequently developed BRSV seroconversion approaching 100%.

Fluorescent antibody techniques were developed for the detection of BRSV in infected tissues, infected cell cultures, and nasal washings.

Experimental inoculations of 12 calves with BRSV by the intranasal and intratracheal routes produced no overt signs of respiratory tract disease.

Publications:

[illegible], C. R. and S. K. Kiesel
Serological Evidence for the Association of Bovine Respiratory Syncytial Virus with Respiratory Tract Disease in Alabama Cattle Infections Immunity 10:293-296, 1974.

The host response in bovine respiratory disease, 3090-11622-003-A, University of Missouri-Columbia

Efforts to produce monospecific guinea pig antisera against bovine rhinovirus have been unsuccessful. Thirteen bovine rhinoviral isolates have been purified by 3 terminal end point dilutions preparatory for injection into gnotobiotic calves in an effort to produce monospecific antisera.

The capacity of different bovine tissues to produce interferon was examined. Of several tissues examined only primary monolayer cultures of bovine leukocytes were found to produce high levels of interferon. Hydrocortisone reduced interferon production in these cultures.

Infectious bovine rhinotracheitis (IBR) vaccine and the pregnant cow, 3090-11621-003-A, North Dakota State University

Ten cows with calves, all known to be free of detectable levels of anti-IBR antibodies, were purchased and the dams were bred to known negative bulls. The animals were divided into a control group (3 cows with calves) and experimental group (7 cows with calves) and held in isolation. When cows in the experimental group had been pregnant for 3 months their nursing calves were vaccinated intramuscularly with commercially available vaccines. No abortions or births have been recorded to date.

Enteric Diseases of cattle

Objectives:

To identify the etiologic agents of enteric diseases of cattle and determine their morphologic, serologic, pathogenic and immunologic characteristics. To determine methods of transmission, prevention and control and to develop diagnostic and immunologic procedures for bovine viral diarrhea, neonatal calf enteritis and weak calf syndrome. The National Animal Disease Center has cooperative projects with University of Idaho and Montana State University on the "weak calf syndrome"; with Ohio State University on neonatal calf enteritis. All of these projects are contributing to the research activity objective of reducing losses from enteric diseases of cattle and calves.

Program:

National Animal Disease Center

To further study the epizootiology of bovine viral diarrhea with particular emphasis upon serologically BVD-negative cattle that are actually shedding BVD virus in their body excretions. Additionally, the potential role of a BVD-infected bull to shed virus in semen and

fect cows at time of insemination will be investiated. To gain a tter understanding of bovine viral diarrhea by comparing the immuno- nic relationships of selected BVD isolates.

iversity of Idaho

To determine the etiologic agents and other factors involved in the "weak calf syndrome" and attempt to reduce losses by preventive, immuno- logic or chemotherapeutic measures. An experimental killed virus vaccine repared from 2 viruses isolated from cattle with the syndrome will be valuated in first calf heifers to determine its efficacy in preventing he syndrome. Studies will continue to determine the role of several iral agents, including BVD, adeno-type 5, corona, IBR, PI-3, reo-like irus, etc., in the etiology of the syndrome.

hio State University

To determine the incidence of specific infectious agents associated ith calf scours in Ohio and evaluate diagnostic methods currently avail- able to differentiate the etiology of individual cases. To investigate he biochemical changes in intestines of calves with enteric disease: etermine the role of adenylate cyclase and cyclic adenosine monophos- phate in E. coli enterotoxin mediated diarrhea and in intestines of normal neonatal calves.

ontana State University

To determine the etiologic agents and other factors involved in the eak calf syndrome and attempt to reduce losses by preventive, immunologic and chemotherapeutic measures.

Progress:

ummary for Intramural Research

Several cattle which were persistently infected with BVD have been found. These animals produce no antibody and the virus can be reisolated from buffy coat at any time. These animals will be studied to determine how long they shed the virus and if their progeny become infected. Al- though the persistently infected animals appear in good health the virus isolated from one of them is pathogenic for normal susceptible calves.

The 3 characteristics of colibacillosis are being studied to develop diagnostic methods. Enterotoxin production can be assayed in the infant mice. The ability of enteropathic E. coli to adhere to the surface of the intestine is being studied to define the mechanism of adhesion and develop rapid, inexpensive methods of testing E. coli for this capacity. Biochemical changes in the diseased intestine are being studied to determine if these changes can be exploited diagnostically.

An inactivated bovine viral diarrhea (BVD) vaccine was developed and tested in both pregnant cattle and young open heifers. The vaccine proved effective, producing antibodies in the pregnant cows which protected the fetus from BVD when the dam was exposed to live BVD virus. The vaccinated heifers were inadequately immunized against BVD and had healthy calves the following spring. The vaccine is being used in two herds that had problems with neonatal disease.

In the past 2 years several cattle have been found which are persistently infected with BVD. These animals have no antibody and the virus persists in the blood, nasal secretions and lacrimal secretions. Several colostrum-deprived calves from farm herds surrounding Ames have been found which are also persistently infected with BVD but are free of antibody against BVD. A 2-year-old bull persistently infected with BVD has been bred to BVD-immune cows. The calves will be studied to determine if they are born carrying the virus or are free of the virus. The bull's lymphocytes and macrophages are immunosuppressed. Investigations will be underaken to see how he will respond to injections of inactivated BVD vaccine, then to several different respiratory disease agents. The persistently-infected, colostrum-deprived calves will be observed to see how long they continue to shed the virus and whether or not carrying the virus has an adverse effect on their general health. It will also be possible to determine whether they infect other animals by contact.

Approximately 100 tissues from calves with weak calf syndrome in Salmon, Idaho, have been examined for virus. Bovine viral diarrhea virus was isolated most frequently (15%). One isolate of bovine adenovirus has been made. One isolate of BVD and one isolate of a bovine enterovirus has been made from a herd in Nebraska, diagnosed as having weak calf syndrome. An outbreak of weak calf syndrome at the U.S. Meat Animal Research Center at Clay Center, NE, is under Thus far no isolates of BVD or bovine adenovirus have been made. An agent that appears to resemble respiratory syncytial virus, when examined by electron microscopy, has been found in cell culture inoculated with tissues of a few calves suffering from weak calf syndrome, both from Salmon, ID, and MARC in Nebraska.

New reference samples of the 8 bovine adenoviruses were obtained from ATCC and passaged in cell cultures. Antisera to 4 serotypes have been prepared and are presently being evaluated for titer and specificity.

Escherichia coli isolated from calves in Minnesota and Montana were tested for entertoxigenicity via bioassay of cell-free broth culture fluid and for K99 antigen via a serum agglutination test. Infant mice were used to assay for heat stable enterotoxin (ST) and adrenal cells in culture were used to assay for heat labile enterotoxin (LT). Forty-six of 345 isolates produced ST enterotoxin; none produced LT enterotoxin. Thirty-five of the 46 enterotoxigenic isolates had K99 antigen, and 9 of 66

enterotoxigenic isolates had this antigen. E. coli that were positive the infant mouse assay also caused positive ligated jejunal loop responses in calves and in 9-day-old (but not in 5-week-old) pigs. It was concluded that the infant mouse and adrenal cell tests for ST and LT combined with the agglutination test for K99, would be useful in the diagnosis of enteric enterotoxic colibacillo of calves.

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Stress Physiology of Animals During Transport

19

Toby G. Knowles and Paul D. Warriss

School of Veterinary Science, University of Bristol, Langford, Bristol BS40 5DU, UK

Introduction

There is an increasing public interest in and concern for the welfare of livestock during transport. The majority of people now live in towns and cities and are no longer in day-to-day contact with farm animals. They are relatively unfamiliar with the animals and the methods of husbandry under which they are kept and, to a large extent, have an idealized picture of farming and animal production. However, there is one point in most animal production systems which is commonly open to public view – when the animals are transported. But, although necessary, transport is generally an exceptionally stressful episode in the life of the animal and one which is sometimes far removed from an idealized picture of animal welfare. So, increasing public concern for animals during transport has spurred research into their welfare, research which has attempted to quantify the severity of the stress imposed by the various stages involved in transport and to identify acceptable conditions and methods to minimize the adverse effects of transport.

Most work has concentrated on quantifying and ameliorating the effects of road transport, as this is the major mode of animal transport, and it is road transport which is the main theme of this chapter. However, there have also been research programmes targeted at other forms of transport. The export of cull sheep from Australia to the Middle East by ship can result in exceptionally high mortality rates during the sea journey. This has prompted the Australian government to fund research into the problem. An introduction to the literature covering this research can be found in Richards *et al.* (1991). A limited number of livestock, usually only those of high value, are transported by air. Recommendations for transporting live animals by air are detailed in the International Air Transport Association (IATA, 1998) *Live Animal*

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Regulations, which are updated annually to take account of the latest research findings. These regulations are enforced by the European Union (EU), the USA and many other countries for the air transport of all live animals.

The assessment of the welfare of animals during transport in any sort of objective and scientific way requires the measurement of something, in a quantifiable and repeatable manner. Broom (1986) defined an animal's welfare as 'the state of an individual with regard to its attempts to cope with its environment'. Within this definition, an animal attempts to maintain homoeostasis through physiological and behavioural changes, and it follows that the greater the behavioural or physiological changes that are required, the more an animal is having to do to cope with the situation or environment and the poorer its welfare is likely to be. This approach provides a working basis by which welfare can be judged and is very much in line with the clinical biochemical approach to the diagnosis of disease in both human and veterinary medicine. In clinical biochemistry, one or a number of measured biochemical or haematological variables in an individual are compared with population norms in order to identify specific disorders (see, for example, Farver, 1997). This sounds fairly straightforward; however, welfare itself is not an objective, measurable thing but is an entirely human concept and, as such, cannot escape a high degree of subjective interpretation. Even when we can communicate with the animal that is being assessed, that is, within our own species, there arise differences in the assessment of the welfare of individuals, owing to differences between 'assessees' and in the opinions and backgrounds of the assessors, and these are not the only source of variability. As a whole, society's idea of what is acceptable human welfare has changed over time. How much more difficult it is, then, to try to 'second guess' the welfare of an animal with which we cannot communicate and which is unlikely to view or interpret its situation in anything approaching our own, human terms and, furthermore, for a range of people then to come to an overall agreement on the level of its welfare.

Thus, the idea of measuring the magnitude of the behavioural and/or physiological adjustments that an animal has to make to cope with its environment provides a useful structure underpinning the assessment of an animal's welfare. However well scientifically founded the measurements, their interpretation cannot escape a high degree of subjective interpretation. We might ask 'What is an unacceptable level of mortality?', when, however well animals are transported, there will always be some deaths. We can measure increasing 'hunger' and dehydration in an animal by changes in blood biochemicals, but how hungry or thirsty can that animal be allowed to become before the situation is unacceptable, when the biochemical changes that are observed increase linearly over time? During mating, play or hunting prey, many of the biochemical variables that are commonly used as measures of animal welfare reach extreme values, but most people would not consider the welfare of an animal in these situations to be impaired.

The remainder of this chapter gives an introduction to the main physiological variables that have been used to assess the stress imposed on animals by transport. As far as possible, these appear in functional groups; that is, they have been grouped as indicators of the various effects that are of interest – food deprivation, dehydration, muscular effort, etc. Following this, we summarize the best practice relating to research to date. Some further details of species-specific research on transport can be found in other chapters, but additionally there are a number of reviews in the scientific literature, which are listed in Table 19.1.

Physiological Variables

Some commonly used physiological indicators of stress during transport are shown in Table 19.2. For a healthy, rested animal of a given species, there is a range of values for each biochemical and haematological variable within which the level of each measure for any individual would normally be expected to fall. The distribution of values found in a healthy, rested population usually forms the familiar, bell-shaped, Gaussian distribution, except for the values of enzymes, for which the distribution is positively skewed, having a greater number of higher values. Published veterinary reference ranges for variables are quoted as the range of values within which 95% of the population would be expected to fall. These limits are the 2.5 and 97.5 percentiles of any

Table 19.1. Recently published reviews from the scientific literature covering the road transport of livestock.

Cattle	
	Tarrant, P.V. (1990)
	Warriss, P.D. (1990)
	Knowles, T.G. (1999)
Calves	
	Trunkfield, H.R. and Broom, D.M. (1990)
	Knowles, T.G. (1995)
Sheep	
	Knowles, T.G. (1998)
Pigs	
	Warriss, P.D. (1987, 1998a,b)
	Tarrant, P.V. (1989)
Cattle, sheep and goats	
	Wythes, J.R. and Morris, D.G. (1994)
Sheep and pigs	
	Hall, S.J.G. and Bradshaw, R.H. (1998)

Table 19.2. Commonly used physiological indicators of stress during transport.

Stressor	Physiological variable
Measured in blood	
Food deprivation	↑ FFA, ↑ β-OHB, ↓ glucose, ↑ urea
Dehydration	↑ Osmolality, ↑ total protein, ↑ albumin, ↑ PCV
Physical exertion	↑ CK, ↑ lactate
Fear/arousal	↑ Cortisol, ↑ PCV
Motion sickness	↑ Vasopressin
Other measures	
Fear/arousal and physical exertion	↑ Heart rate, ↑ respiration rate
Hypothermia/hyperthermia	Body temperature, skin temperature

FFA, free fatty acids; β-OHB, β-hydroxybutyrate; PCV, packed-cell volume; CK, creatine kinase.

distribution and are approximately equivalent to ±2 standard deviations about the mean when the variable does have a Gaussian distribution. Figure 19.1 shows the frequency distributions of plasma albumin levels and of the enzyme creatine kinase (CK) from control samples obtained from cattle in a study by Knowles *et al.* (1999a). The distribution of albumin values is very close to the Gaussian curve which is superimposed on the graph, whilst the distribution of CK values is far from Gaussian. The 2.5 and 97.5 centiles of the albumin values are 34.9 and 45.4 g l^{-1}, respectively, and for CK 58.6 and 302.4 U l^{-1}. The mean and standard deviation provide a useful summary of the albumin data and the percentiles are close to the mean ±2 SD. This is not the case for the distribution of the CK values, which are strongly right-skewed.

Published reference ranges are useful in the diagnoses of a wide variety of diseases and can be useful for evaluating hypo- and hyperthermia, the degree of dehydration and, to a lesser extent, the degree of hunger arising during transport. However, it should be remembered that most of the physiological changes seen during transport are due to the action of normal homoeostatic mechanisms taking place within a healthy population of animals in response to the variety of different stressors. Thus clinical reference ranges are of limited use in evaluating welfare during transport, as the animals being transported are generally all healthy. So care should be taken in drawing any conclusions from comparisons with published normal ranges. What is really of interest is the change of a variable over time within an individual animal, as this is an indication of the scale of the response that an animal is mounting in order to cope. Because of the inherent variability between individuals, measurements are best taken at the level of the individual over time. The following is an overview of some physiological variables which can give some insight into how an animal is coping with a given situation. However, instead of moving directly to descriptions of individual biochemical and haematological markers, we start with the ultimate indicator of the inability of an animal to cope.

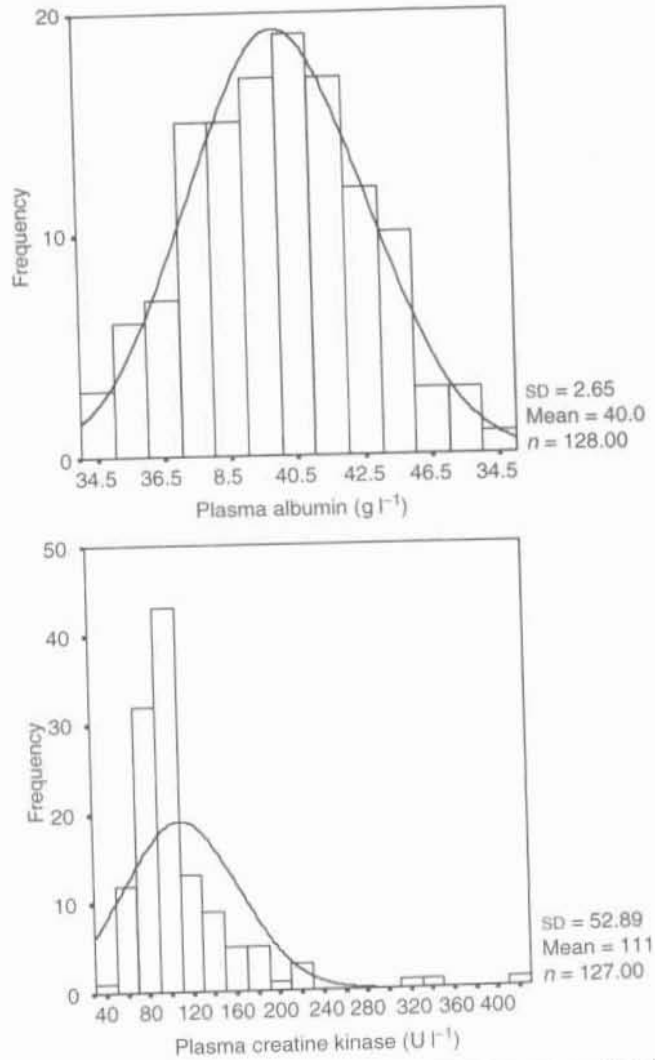

Fig. 19.1. The frequency histograms of plasma albumin and creatine kinase from rested cattle from a study by Knowles *et al.* (1999a). The Gaussian curves for distributions with the same means and standard deviations as the data are superimposed.

Mortality

Mortality is a useful indicator of physiological stress. When an animal dies during transport, it is because its physiological mechanisms have failed to maintain homoeostasis. That transport is stressful is most readily quantified by the increased mortality which accompanies it. On average, in a given time period, a greater number of livestock will die if they are transported than if they

are not. Of course, the animals which die initially are often those that are weaker and the overall mortality rates during road transport for most livestock are usually only fractions of 1%. This means that the rate can only be accurately estimated when large enough numbers are surveyed. However, increased mortality is interpreted by most people as an indicator of poor welfare and of the stressful nature of transport, in a way that many other types of measures are not so easily agreed upon.

If an increase in mortality is seen, even if mortality is only occurring amongst weaker animals, it is an indication that conditions are harsher and that the animals that do survive are probably facing a greater challenge. If a large enough number of animals is being considered, mortality rate is also a useful measure of the relative 'stressfulness' of methods of handling and transport. For instance, Warriss *et al.* (1992) surveyed journey times and mortality rate amongst broilers transported to slaughter and found a strong relationship between the two variables. The results showed a marked non-linear increase in bird mortality for journeys greater than 4 h, strongly suggesting that transport for longer than 4 h was undesirable. However, results like these are more easily obtained from broilers, as they have the highest mortality rates amongst the commonly transported types of livestock. The high mortality rates in broilers are in part due to the heavy commercial selection for improved growth rate and feed conversion to slaughter at 42 days, which has rather disregarded bird viability much beyond this age. The same trend can be seen occurring in pigs, which are under similar selection pressures but which have a longer reproductive cycle and are not yet at the same level of selection.

Live-weight, β-hydroxybutyrate, free fatty acids and liver glycogen as indicators of fasting

Transport can involve extended periods without food or water and, as a consequence, there is an initial loss of live-weight, which is predominantly due to loss of gut fill; approximately 7% of body-weight in ruminants and 4% in pigs is lost during the first 18–24 h. Generally, weight loss during transport is accelerated, compared with when an animal is simply deprived of food and water and not transported. In ruminants, the main loss of gut fill takes place during the first 18–20 h of transport. Loss of gut fill in itself is unlikely to be directly deleterious to the animal. There is, however, an approximately linear loss of body-weight, measured as a decrease in carcass weight, which is due to dehydration and to the use of body reserves. This can be measured as the rate of loss of carcass weight and, within species, has been found to show quite large variation across different studies, these differences being due to the condition of the animals, the environment and the conditions of transport.

Once an animal is deprived of food and water, it has to rely on its body reserves to buffer it, until it can feed and drink again. The main energy store in

the body is in the form of lipids and by far the most important of these are triacylglycerols (or triglycerides). In the form of subcutaneous fat, these can also provide thermal insulation. Triacylglycerols are mobilized by breaking them down into the constituent glycerol and fatty acids. These non-esterified fatty acids (NEFA) or free fatty acids (FFA) are transported in the blood bound to proteins. Triacylglycerols can be synthesized by many types of cell, but most synthesis takes place in the liver, adipose tissue and the small intestine. Lipolysis, the mobilization of body fat, is under hormonal control. As an animal fasts, much less glucose is available from the gut or glycogen reserves and this results in decreased levels of glucose in the blood plasma. This leads to hormone changes, increased glucagon levels and decreased insulin levels, which trigger hormone-sensitive lipase to break down adipose triacylglycerols, which are hydrolysed to FFA and glycerol. FFA can be utilized directly by most tissues and, as insoluble lipids, are bound to albumin in the plasma for transport around the body, whilst glycerol is transported dissolved in plasma water. Thus, during starvation, levels of FFA rise in the plasma, whilst actions that promote FFA synthesis suppress lipolysis and plasma FFA levels are not elevated.

The liver holds a reserve of glycogen and, during the first day of fasting, this reserve diminishes rapidly. Levels of liver glycogen can be measured by biopsy or at slaughter. Changes in liver weight can also be used as a measure of the use of these reserves. There are also reserves of glycogen within the skeletal muscle, which tend to be conserved even after several days of fasting.

During fasting, the usual metabolic pathways are modified and greater amounts of ketones are produced from FFA in the liver. Very high levels of FFA are damaging to tissues. The liver converts them to ketones. One of the main ketones is β-hydroxybutyrate (β-OHB) (or 3-hydroxybutyrate (3-OHB)). Because FFA can be utilized by most tissues, it was not clear until recently why ketones were produced. But it now appears that many tissues more easily utilize β-OHB than FFA. In fact, in some species, such as humans, ketones form the main energy source for the brain during fasting. This is not the case with the sheep or pig, where the brain still relies on glucose as the main energy source. Ketones are the main fuel of resting skeletal muscle during short-term fasting, but during long-term starvation or exercise FFA become the main energy source. There is a biological limit to the amount of FFA that can be present in the plasma, as all FFA have to be bound to albumin for transport. Levels of ketones in the plasma are not restricted in this way, which is important, as levels of plasma albumin decrease during fasting, thus reducing the amount of FFA that can be transported.

During exercise, glucose, ketones and FFA are all used as fuel. After strenuous exercise, ketone oxidation by muscles is reduced and this leads to an increase in plasma levels of FFA and β-OHB, which may be several times higher than pre-exercise levels. However, for several minutes immediately after exercise, levels may fall momentarily below pre-exercise levels as the metabolism adjusts.

Plasma osmolality, total protein, albumin and packed-cell volume as indicators of dehydration

Water is essential to all of the processes which take place within the body, accounting for 60% of the total body-weight for most domestic animals. However, adipose tissue contains little water and 'fat' animals, such as fattened lambs and pigs, will contain a lower percentage of water. Total body water is considered, physiologically, to be made up of the extracellular fluid (ECF) volume and intracellular fluid (ICF) volume, where the ECF is all fluid outside the cells. Fluid present in the gut is sometimes considered as part of the ECF. In ruminants, the forestomach may contain a substantial amount of fluid – up to 30–60 litres in adult cattle – which, during periods of water deprivation, can act as a buffer to maintain effective circulating volume. During periods of inadequate water uptake, the water losses are balanced proportionately between the ICF and non-gut ECF; thus electrolyte balance between the two is maintained.

Packed-cell volume (PCV), total plasma protein and plasma albumin are convenient and simple measures of dehydration. PCV is the percentage of the blood volume occupied by cells (predominantly the red blood cells), the remainder of the volume being fluid. Thus, as long as there is no loss or gain of cells, PCV is a measure of the plasma volume. However, many species have a reserve of red blood cells in the spleen, which are readily released in response to excitement and stressors, so it is useful to use total plasma protein and albumin levels in addition to PCV. The assumption is made that the total amount of protein present in the plasma remains the same. Both total plasma protein and plasma albumin should show the same type of change if the effect is due to dehydration and not a dietary effect. It should be noted that the percentage changes in protein and PCV will not be the same for a given loss of plasma volume, e.g. a 10% plasma volume deficit would result in an 11% increase in protein but only, perhaps, a 2.5% increase in PCV. Osmolality can be used as a further, simple measure of plasma water content, as it is a colligative property and therefore includes all solute species. As a rough guide to the extent of dehydration, clinical signs are usually apparent when 4–6% of total body-weight of 'effective' (not including fluid in the gut) total body water has been lost, moderate dehydration is when 8–10% has been lost and severe dehydration is said to occur when losses are greater than 12% (Carlson, 1997).

Heart rate, respiration rate, plasma cortisol and glucose as indicators of a general reaction to stress

An initial response to stress is the release of the hormones adrenaline and noradrenaline into the bloodstream from the adrenal glands. Noradrenaline is also released from sympathetic nerve endings, where it can act directly. The release of these hormones causes an acute increase in heart rate and blood pressure and stimulates hepatic glycogenolysis. This leads to an increased availability of glucose and a rise in plasma glucose levels within minutes. The effects of these hormones provide a useful measure of stress, but they have rather short half-lives in the bloodstream. In the slightly longer term, an animal's response to stress is mediated mainly through the hypophyseal–adrenal axis, a system in which neural and endocrine control systems are integrated in a such a highly complex and interdependent manner that it can only be described superficially here. Glucocorticoid hormones, produced in and released from the cortex of the adrenal glands in response to an extremely wide range of stressors, play a major role in mediating the physiological response. Cortisol is the central glucocorticoid in mammalian farm species and corticosterone in avian species. The pathway leading to the release and control of cortisol acts through the hypothalamus, pituitary and the adrenal cortex and is summarized in Fig. 19.2. The glucocorticoids play a major role in glucose metabolism, inhibit protein synthesis, initiate proteolysis and modulate immunological mediators, such as lymphokines and mediators of inflammatory reactions, causing anti-inflammatory effects. Because of the role of the brain in the release of glucocorticoids, they are widely interpreted as a measure of an animal's psychological perception of a situation, in addition to the extent of its physiological reaction.

Creatine kinase, muscle glycogen and lactate as indicators of physical activity

The enzyme CK (also referred to as creatine phosphokinase (CPK)) is present in muscle, where it makes ATP available for contraction by the phosphorylation of ADP from creatine phosphate. It appears in the circulating plasma as a result of tissue damage and is relatively organ-specific, occurring as three isoenzymic forms, with an additional fourth variant that derives from mitochondria. Identification of the levels of isoenzymes present in the blood allows determination of the tissue which is the source and to which damage has occurred. During exercise there is increasing CK 3 (the main isoenzyme present in muscle and also known as CK-MM) activity present in the blood, as it leaks from the cells of skeletal muscle. Lactate dehydrogenase (LDH) has also been used as a measure of muscle damage, however, LDH activity is high in various tissues throughout the body and measurements are perhaps not so organ-specific.

During exercise, the main fuels for muscular contraction are glucose and fatty acids from the blood. There is also an intramuscular carbohydrate reserve in the form of glycogen, and it is when muscle glycogen stores are depleted that exhaustion has been shown to set in. The main extramuscular carbohydrate source is glycogen in the liver. Reserves of muscle and liver glycogen may be measured by biopsy but, as most transport of animals is to slaughter, it is usually assayed in muscle and liver sampled immediately after slaughter. Metabolism of glucose can take place aerobically or anaerobically; in the latter

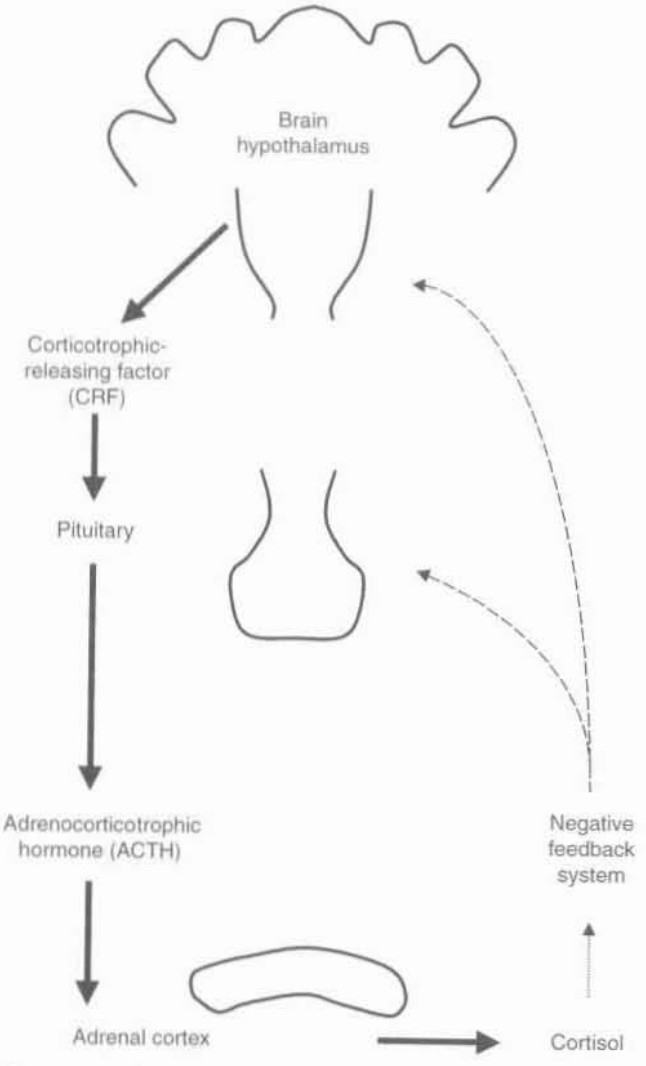

Fig. 19.2. The main pathways controlling the release of cortisol.

case there may be a gradual build up of lactate. Lipids can be metabolized only aerobically. In the initial few seconds of exercise, metabolism is mainly anaerobic. If the exercise is not too strenuous, aerobic metabolism of glucose and lipids takes over and lactate production decreases. The harder the exercise is, the higher is the percentage use of carbohydrate over lipid; thus lactate production is closely correlated with the intensity of exercise and may be seen as increased levels of lactate in muscle and in plasma. The degree to which the reserves of muscle glycogen are depleted at the time of slaughter has an effect on the post-mortem changes which take place in the muscle. If glycogen reserves have been depleted to any great extent, the muscle produces meat of

an inferior quality, which looks dark, tends to have a less acceptable eating quality and is more prone to microbial spoilage, partly because it has a higher pH (is less acidic). Meat with this quality problem is commonly referred to as 'dark, firm and dry' (DFD) and is most prevalent amongst cattle and pigs, being less common with sheep.

Urea

Any process which increases protein catabolism will tend to result in increased levels of plasma urea. Thus, levels of urea increase in response to stress, when levels of cortisol increase, and they will also rise as a result of food deprivation.

Vasopressin as an indicator of travel sickness

The major role of the hormone vasopressin is to regulate body water homoeostasis, in regard to the relative osmolality of the ECF and ICF, by controlling reabsorption. Its release is mainly triggered by increased plasma osmolality and it acts by causing water retention. However, its release is relatively insensitive to changes in plasma volume; thus it normally plays little role in maintaining overall water balance (i.e. how much water is in the whole animal). Increased levels of vasopressin have been shown to be of use as an indicator of nausea and vomiting. Two types of vasopressin occur: most mammals produce arginine vasopressin, but the pig produces only lysine vasopressin.

We have been able to discuss only briefly the main biochemical and haematological indicators that have been used to evaluate animal welfare during transport. For more in-depth information, the reader should refer to one of the many textbooks which deal with clinical veterinary biochemistry. At the time of writing, Kaneko *et al.* (1997) provide a relatively up-to-date and comprehensive reference.

The Physiological Responses of Cattle, Sheep and Pigs to Transport

Cattle

Mortality rates amongst cattle transported by road are generally much lower than those of other forms of livestock. To a large extent, this is because the care with which animals are transported and the attention paid to their welfare are in proportion to the value of the individual animal (Hails, 1978). Over the first 18–24 h of transport, loss of body-weight can range from 3 to 11%. This is mostly due to loss of gut fill. Loss of carcass weight increases approximately

linearly with transport time and has variously been reported to range from less than 1% to 8% over 48 h. Access to water can reduce both loss of body-weight and loss of carcass weight (Warriss, 1990). After 24 h of transport, there is an increase in plasma levels of β-OHB, FFA, osmolality, total protein and albumin, indicative of mobilization of food reserves and increasing dehydration (Tarrant *et al.*, 1992; Warriss *et al.*, 1995; Knowles *et al.*, 1999a). After 24–31 h of transport, levels of plasma cortisol, glucose and CK are elevated. In sheep, these variables generally return to pre-transport levels after approximately 9 h of transport, but in cattle they tend to remain elevated or to increase steadily. Additionally, in cattle there is a gradual depletion of muscle glycogen (Knowles *et al.*, 1999a) and an associated increase in the pH of the meat (Tarrant *et al.*, 1992). These changes arise because cattle prefer to stand during transport, as they are relatively heavy animals and lying can produce considerable pressure on the parts of the body in contact with the floor of the vehicle, especially during a rough journey. The act of lying down and rising is difficult on a moving lorry at the stocking densities used for transport and there is a risk of being trampled or fallen on. The changes seen in these variables indicate that there is some physical effort involved in remaining standing and having to maintain balance against the motion of the vehicle. Despite the dangers and discomfort involved in lying, towards the end of the first 24 h of transport some cattle do lie down (Tarrant *et al.*, 1992; Knowles *et al.*, 1999a). This could be because of the physical effort involved with standing, although the physiological changes seen do not indicate excessive physical demand. Knowles *et al.* (1999a) hypothesized that the animals could possibly be in need of sleep, as those animals that did lie down displayed higher levels of plasma cortisol. Raised levels of plasma cortisol are associated with sleep deprivation in humans (Leproult *et al.*, 1997).

Knowles *et al.* (1999a) offered water to cattle on board lorries for 1 h following 14 h of transport within the UK. They found that fewer than 60% of animals drank, few drank fully and activity levels rose whilst the vehicle was motionless, leading them to conclude that the stop merely prolonged transport and further exhausted the animals, rather than providing any recovery. Warriss *et al.* (1995) found that it took cattle 5 days to recover the live-weight lost during 15 h of transport. Knowles *et al.* (1999a) found little difference in the pattern of recovery following either 14, 21, 26 or 31 h of transport. Levels of plasma β-OHB, FFA, urea and glucose had recovered to pre-transport levels after 24 h in lairage with food and water freely available, as had levels of plasma cortisol. Levels of indicators of hydration took up to 72 h to return to pre-transport levels, whilst full pre-transport live-weight had not been recovered even after 72 h of lairage.

Based on the physiological indicators of fatigue and dehydration and on the behaviour of the animals, both Tarrant *et al.* (1992) and Knowles *et al.* (1999a) suggest a maximum continuous transport time of no longer than 24 h for cattle. Knowles *et al.* (1999a) recommend a mid-transport lairage period of, ideally, 24 h with food and water available, to allow recovery from the physical demands of transport. They considered that short mid-transport stops were unlikely to provide reasonable opportunity for rest or recovery.

However, including a lairage stop of any length provides an opportunity for cattle from different sources to exchange pathogens. Experience in the USA has shown that 200–300 kg cattle will suffer fewer post-transport health problems if they are transported for a complete 32-h journey, without any lairage stops. Whether the increased health problems are due to exposure to novel pathogens or to the inadequacy of the lairage conditions, essentially extending the stress of transport, is not known (Grandin, 1997).

Tarrant *et al.* (1992) studied the effects of three stocking densities on 600 kg cattle that were transported for 24 h. Following transport, they found that levels of plasma CK, cortisol and glucose had increased with increasing stocking density, as had the amount of bruising on the carcasses, indicative of increased physical and psychological stress and poorer welfare. They concluded that stocking densities above 550 kg m^{-2} were unacceptable for this size of animal on long journeys. These results run counter to the popularly held belief within the industry that packing animals in tightly helps support them and prevents them from being jolted and bruised. Too high a stocking density was found to prevent the animals from holding a proper footing, by overly restricting their movement. The highest stocking density, and the one that was found to be unacceptable, was that which would normally be considered to represent a full load – the maximum number of animals which could be held in a pen and the gate still easily closed.

Young calves (cattle less than 1 month of age)

Neonatal animals are generally less well adapted to cope with transport and are more vulnerable than the adult animal. The long-distance transport of very young cattle is common and usually takes place within days or weeks of birth, whilst the animal is still unweaned and is fully dependent on milk. Calf mortality during transport tends to be low; however, mortality rates following transport can be high, usually as a result of disease (Knowles, 1995). In a large-scale survey of calf mortality and husbandry within the UK, Leech *et al.* (1968) estimated the mortality of transported calves to be 160% that of calves that remained on their farm of birth. Mortality of calves transported below 1 month of age remained markedly above that of home-bred calves until 2 months after purchase. In calves under 1 month old, various authors have reported a strong negative correlation between mortality/morbidity and age when first transported (Knowles, 1995). In addition to the age at which calves are transported, the length of time that marketing takes is also important. Mormede *et al.* (1982) found less post-transport disease amongst calves whose marketing took only 13 h rather than 37 h.

The reactivity of the adrenal glands to adrenocorticotrophic hormone (ACTH) increases with age and is not fully developed in the young calf (Hartmann *et al.*, 1973). Several authors report that the increase in plasma cortisol usually seen in response to transport is not present in young calves

(Knowles, 1995). Neither do calves show the usual increase in heart rate and plasma glucose levels (Knowles *et al.*, 1997). These authors concluded that calves were unable to respond to the stress of transport because of their immaturity, and that the lack of a cortisol response was not because they were relatively 'unstressed' by the process of transportation. Using measurements of rectal temperature, Knowles *et al.* (1997, 1999b) found that, when transported during cold weather, calves found difficulty in maintaining body temperature during transport and regulating it afterwards. Loss of live-weight was greater in the cold.

During and immediately after long-distance transport, calf hauliers within Europe prefer to feed a glucose and electrolyte solution rather than milk replacer, as they report that this reduces the incidence of diarrhoea. Knowles *et al.* (1997, 1999b) found that feeding electrolyte during transport of 19–24 h provided little benefit in terms of rehydration and improvements in levels of plasma metabolites and so recommended that it was best to complete the journey without the disruption and stress of feeding. Liquid feeding of unweaned calves requires the observation, and often the handling, of each individual animal. It also requires attention to hygienic presentation of the feed, which has to be made up to the correct temperature and solution strength in order to avoid digestive problems. There was some evidence from the study of Knowles *et al.* (1999b) that feeding just cold water during transport was detrimental to the calves.

If there is sufficient room for them to do so, calves spend much of the time lying down during road transport. Knowles *et al.* (1997) found that calves spent approximately 50% of the time lying during 24 h of transport. During cold weather, the amount of the journey spent lying increased to 80–90% (Knowles *et al.*, 1999b). Following transport for 24 h Knowles *et al.* (1999b) reported that most of the commonly measured physiological variables had returned to pre-transport values after 24 h of lairage and feeding, except for live-weight and levels of plasma CK, which took up to 7 days to recover.

Overall, present evidence indicates that young calves should not be transported until they are at least over the age of 1 month, but further work is required to confirm that this age limit should not be further extended. If they are to be transported, then it is best to keep the marketing time to a minimum, to avoid feed/rest stops if transport is for no longer than 24 h, to avoid exposing the calves to cold and to avoid cross-contamination of animals from different sources. The animals should be well bedded, especially in cold weather, and transported at a stocking density which allows enough space for them all to lie down.

Sheep

The mortality rate amongst slaughter lambs transported by road within the UK has been estimated as 0.018% (Knowles *et al.*, 1994b), as 0.10% within South Africa (Henning, 1993) and as between 0.74 and 1.63% within Queensland, Australia (Shorthose and Wythes, 1988). In the UK those lambs which go direct from farm to slaughterhouse have an estimated mortality rate of 0.007% compared with 0.031% for those which pass through a live auction market (Knowles *et al.*, 1994a). Occasionally, mass deaths within single loads of sheep are reported. These are most often associated with a combination of high ambient temperatures and reduced ventilation on a stationary lorry. In many countries, there is a trade in cull sheep. There is anecdotal evidence that the mortality rates amongst these relatively infirm, low value animals can be high during transport.

The loss of live-weight during transport has been well documented in lambs. Wythes and Morris (1994) averaged the results from eight pieces of work and found live-weight losses of 3, 5, 7.5, 11, 12 and 14% over 6, 12, 24, 48, 72 and 96 h, respectively, with food withdrawal alone; however, losses as high as 20% after just 72 h have been reported by Horton *et al.* (1996) when also deprived of water. They also found that, following transport, food intake was depressed. Combining data from various sources, Wythes and Morris (1994) found the average rate of loss of carcass weight to be 1.7% day^{-1} over 4 days when lambs were deprived of only feed and not transported, with a range from 1.3 to 2.3% day^{-1}. During periods of fasting and transport of up to 72 h, plasma levels of β-OHB have been found to increase linearly at a rate of approximately 0.006 mmol l^{-1} h^{-1} (Warriss *et al.*, 1989, Knowles *et al.*, 1995). Levels of plasma FFA tend to rise linearly with periods of fasting and transport, at a rate of approximately 20 μmol l^{-1} h^{-1}, but peak and flatten out, with no further increase, between 18 and 24 h, whilst levels of plasma urea increase approximately linearly by 30–50% during 24 h of transport (Knowles *et al.*, 1995, 1998).

When sheep were held without food or water for 48 h at temperatures up to 35°C, Parrott *et al.* (1996) found little evidence of dehydration from measurements of plasma osmolality, but they did find evidence that the sheep were unable to maintain water balance if they consumed feed. Sheep transported for up to 24 h in the summer in the UK showed no signs of dehydration, as measured by plasma total protein, albumin and osmolality. However, sheep transported across France for 24 h, during which daytime temperatures rose above 20°C, showed signs of dehydration, with increases in plasma total protein, albumin and osmolality of approximately 10, 12 and 5% respectively (Knowles *et al.*, 1996). In accord with Parrott *et al.* (1996), Knowles *et al.* (1996) noted that feeding during and after transport tended to disrupt water balance. This has important implications for the length of mid-transport lairage stops as, after short periods of food and water deprivation, sheep are primarily interested in eating and do not drink readily or immediately (Knowles *et al.*, 1994a). A lairage stop of just 1 h, as is currently required for transport of over 14 h within Europe, is sufficient for the animals to eat but not to drink, so animals may be reloaded after having consumed a high dry-matter

feed, but no water. A minimum mid-transport lairage time of 8 h has been recommended (Knowles, 1998).

Measurements of heart rate, plasma cortisol, glucose and CK have shown that it is the initial stages of transport that are most stressful to sheep (Knowles *et al.*, 1995). Heart rate peaks at loading and there is a rise in cortisol, glucose and CK levels at loading, but after 9 h of transport these variables have generally returned to approximate basal levels and the only measurable changes seen are then due to the effects of feed and water deprivation; which can be exaggerated by the conditions of transport. However, the conditions of transport are important. Sheep that are loaded at too high a stocking density to be able to lie down easily show elevated levels of plasma CK, indicative of physical fatigue caused by having to remain standing (Knowles *et al.*, 1998).

As long as they are fit, loaded at an appropriate stocking density, the ambient temperature is not extreme and the load is properly ventilated, sheep appear to cope reasonably well during transport. However, Horton *et al.* (1996) reported that, after passing through a live auction market, lambs transported for 72 h without food or water, whilst not differing in terms of performance or blood metabolites from animals simply deprived of food and water for 72 h, suffered in terms of compromised general health. This was probably a result of confinement on the lorry and exposure to unfamiliar animals and pathogens, combined with the effects of deprivation and transport *per se*. After transport, the recovery of physiological variables to pre-transport levels appears to take place in three stages (Knowles *et al.*, 1993). After 24 h of lairage, with food and water, variables usually associated with short-term stress and the variables associated with dehydration had returned to normal levels. After 96 h, there had been a well-defined recovery in live-weight and levels of most of the metabolites measured had returned to normal levels. At 144 h of lairage, a fuller recovery had taken place, levels of CK had fallen and all variables had stabilized.

Where appropriate, it is always preferable, and generally makes better economic sense, to transport carcasses rather than live animals. Transport is stressful and transport times should be kept to a minimum. After 9 h of transport, the changes in physiological variables with time tend to be linear and are of little help in determining a maximum acceptable transport time. Behavioural studies of motivation to feed have shown that sheep will begin to work for food after 10–12 h of deprivation. At present, all the evidence taken together points to an acceptable maximum journey time in the region of 24 h when transport is continuous and when food and water are not available. If a lairage stop is included in a journey, it should be for a minimum of 8 h with both food and water continuously available. However a lairage stop does increase the chance of cross-infection between animals from different sources and animals stressed by the process of transport will tend to already be immunologically compromised and vulnerable.

Pigs

The mortality rate amongst pigs transported to slaughter within the UK has changed little over 20 years and is estimated to be 0.061% with a further 0.011% of pigs dying in the lairage pens before slaughter (Warriss and Brown, 1994). However, there are marked differences in mortality rates between different countries. The rates are particularly higher in countries where the slaughter-pig population contains a large proportion of genes from stress-susceptible breeds, such as the Pietrain and Belgian Landrace. Estimates range from 0.3 to 0.5% in Belgium and Germany (Warriss, 1998a). The other major factor influencing the mortality of pigs during transit is ambient temperature. Pigs are sensitive to high temperatures because they are poorly adapted to lose heat unless allowed to wallow, a behaviour not possible during transport. The relationship between mortality and ambient temperature is curvilinear. This is illustrated in Fig. 19.3 with data for the UK from Warriss and Brown (1994), which show that there was a marked increase in mortality when average monthly temperatures rose above 15°C. Other factors of importance are the time of last feed before loading, vehicle deck, stocking density and possibly journey time. Pigs fed too soon (< 4 h) before transport are more likely to die, as are those carried on the bottom deck, at higher densities and for longer. However, the evidence for the latter is contradictory.

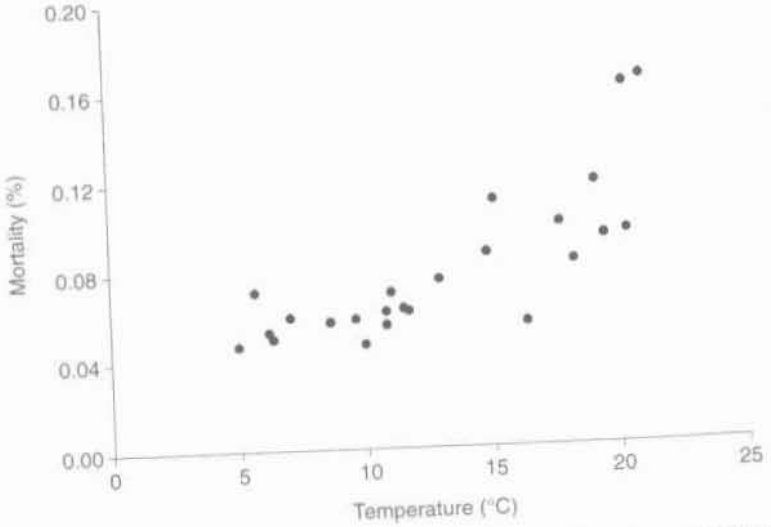

Fig. 19.3. The relationship between average monthly ambient temperature and the mortality of pigs transported to slaughter.

Pigs find simulated transport aversive (Ingram *et al.*, 1983), particularly the vibration associated with it (Stephens *et al.*, 1985) and if they have recently eaten a large meal. Because pigs may vomit during transport (Bradshaw and Hall, 1996; Riches *et al.*, 1996) and show increased circulating levels of vasopressin, a hormone associated with feelings of motion sickness in humans, part of their aversion may be attributable to similar feelings of sickness.

That pigs find at least some aspects of transport psychologically stressful is evidenced by increases in plasma adrenaline (Dalin *et al.*, 1993), indicating stimulation of the sympathoadrenal system, and in cortisol (see, for example, Dantzer, 1982), with corresponding depletion of adrenal ascorbic acid (Warriss *et al.*, 1983), indicating stimulation of the hypophyseal–adrenal axis. They may also find it physically stressful, based on elevations of circulating activities of the enzyme CK (Honkavaara, 1989).

The physical stress they experience will be determined by the comfort and length of the journey. It is likely to be greater if vibration levels are higher. Modern vehicles, with air suspension and driven on smooth roads, will provide more comfort than older vehicles, with traditional spring suspension systems driven on poorer-surfaced roads. Physical stress and the associated fatigue are likely to be higher if pigs stand, rather than lie down, during the journey. There is some debate about whether pigs prefer to stand or lie down. The available evidence has been reviewed by Warriss (1998b), who suggested that it pointed to the view that pigs preferred to stand on short journeys in which the conditions made it uncomfortable to lie down. These conditions could be excessive vibration or uncomfortable flooring, perhaps because of inadequate bedding. But, under comfortable conditions, many, if not all, pigs would lie down if given sufficient space, especially on longer journeys.

What is sufficient space was also discussed by Warriss (1998b). It is equivalent to a stocking density of not higher than about 235–250 kg m^{-2} for normal slaughter pigs weighing between 90 and 100 kg. For smaller pigs the space requirement would be expected to be slightly greater and for larger pigs slightly less. European Community (EC) Directive 95/29/EC requires that the loading density for pigs of around 100 kg should not exceed 235 kg m^{-2}. Also, the Directive recognizes that this density may be too high under certain conditions. Breed of pig, size and physical condition of the animals or weather and journey time may mean that the space allowed has to be increased by up to 20%. Pigs carried at very high stocking densities show increased circulating levels of CK (Warriss *et al.*, 1998). The provision of appropriate amounts of space is especially important with longer journeys.

The physiological state of an animal at slaughter often affects subsequent lean-meat quality. Thus, muscle glycogen depletion can lead to elevated ultimate muscle pH in the meat. Longer transport sometimes results in muscle glycogen depletion and more meat with high ultimate pH (Malmfors, 1982; Warriss, 1987). This is seen as a higher prevalence of DFD pork.

During transport, pigs are deprived of food. They are often also deprived of water although current EU legislation (EC Directive 95/29/EC) prescribes that pigs transported for more than 8 h must have continuous access to drinking-water. There is evidence, however, that pigs drink only very small amounts of water (Lambooy, 1983; Lambooy *et al.*, 1985). Some studies (Warriss *et al.*, 1983) have indicated that pigs can become dehydrated after only short journeys, but data from other work (Becker *et al.*, 1989) have not supported this. Food deprivation leads to losses in live- and carcass weight (Warriss, 1985), liver weight and liver glycogen (Warriss and Bevis, 1987) and muscle glycogen (Warriss *et al.*, 1989). These are undesirable. However, some period of food withdrawal before transport is desirable to minimize mortality and, in the case of slaughter pigs, to facilitate hygienic carcass dressing. Four hours has been recommended (Warriss, 1994), but this may be too short a time, based on observations of vomiting during transport, although the ideal period of withdrawal is not clear (Warriss, 1998a).

Many slaughter pigs are mixed with unfamiliar animals when they are assembled for sending to slaughter. This usually leads to fighting, particularly between dominant individuals. The consequences are elevations in circulating cortisol, CK and lactate and depletion of muscle glycogen (Warriss, 1996). Mixing pigs is undesirable from the points of view of both welfare and meat quality. Nevertheless, in the UK about 40% of pigs show some evidence of fighting and between 5 and 10% evidence of severe fighting.

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ATTACHMENT 9

Factors associated with fatigued, injured, and dead pig frequency during transport and lairage at a commercial abattoir

R. F. Fitzgerald, K. J. Stalder, J. O. Matthews, C. M. Schultz Kaster and A. K. Johnson

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Factors associated with fatigued, injured, and dead pig frequency during transport and lairage at a commercial abattoir[1]

R. F. Fitzgerald,* K. J. Stalder,*[2] J. O. Matthews,† C. M. Schultz Kaster,† and A. K. Johnson*

*Department of Animal Science, Iowa State University, Ames 50011; and †Farmland Foods, Milan, MO 63556

ABSTRACT: The objective of this study was to identify environmental and management factors that are associated with the frequency of fatigued, injured, and dead pigs on arrival and in resting pens during lairage at a commercial Midwest abattoir. The terms transport losses or total losses refer to pigs that die or become nonambulatory at any stage of the marketing process. In this study, fatigued, injured, and dead pigs were summed into a variable termed total losses. Relative humidity (%), temperature (°C), wind speed (m/s), and dew point (°C) data were collected on 12,333 trailer loads of pigs. Week, sort from barn (first or third pig removal from barn), farm, normal vs. split load type (from 1 or multiple barns), load crew, driver, trailer, and wind direction were used as fixed effects in the model for the analysis of losses per load using generalized mixed models for Poisson distributions. Seven temperature-humidity indices (THI) were calculated and compared as model covariates. Load time per pig, trailer density (pigs per trailer × average BW/trailer space; kg/m^2), wait time before unloading at the abattoir, and wind speed were used as model covariates. The log of the number of hogs per trailer was used to standardize the response variable. The linear covariate density accounted for the greatest portion of variance (based on F-value) followed by the fixed effect sort from barn, the fixed effect load type (pigs from 1 or multiple barns within a farm), load time per pig linear covariate, and THI. Pigs transported to the abattoir from June through July experienced fewer losses ($P < 0.001$) when compared with pigs that were transported from November through December. Keeping other factors constant, the log of total losses (%) per load increased by 0.0102x + 0.000541x^2 per unit of THI and 0.0191 kg/m^2 of density. Similarly, of 9 farms, the poorest-performing farm in regards to total loss percentage experienced 0.93% more losses per load when compared with the farm with the least loss percentage. This study demonstrates that multiple environment and management factors influence the incidence of market hog transport losses.

Key words: fatigued pig, nonambulatory, trailer density, transport, weather

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INTRODUCTION

The term transport losses refers to pigs that die or become nonambulatory at any stage of the marketing process. Pigs that die during transport are referred to as dead on arrival, whereas pigs that die after having been unloaded are termed dead in yard or dead in pen (M. J. Ritter, Elanco Animal Health, Greenfield, IN; M. Ellis, University of Illinois, Urbana; S. E. Curtis, University of Illinois, Urbana; N. L. Berry, Cargill Meat Solutions, Wichita, KS; S. R. Niekamp, Natl. Pork Board, Des Moines, IA; A. K. Johnson, Iowa State University, Ames; unpublished data). Transport losses represent multiple challenges for the entire US food chain. First, transport losses are a welfare priority (NPB, 2008). Second, government-imposed rules and regulations may occur if the pork industry does not address these issues, and third, transport losses represent direct financial losses to pig producers and pork processors (or slaughter houses). Dead and nonambulatory pigs have been estimated to cost the US pork industry $50 to $100 million annually (Ellis et al., 2003; M. J. Ritter, Elanco Animal Health, Greenfield, IN; M. Ellis, University of Illinois, Urbana; S. E. Curtis, University of Illinois, Urbana; N. L. Berry, Cargill Meat Solutions, Wichita, KS; S. R. Niekamp, Natl. Pork Board, Des Moines, IA; A. K. Johnson, Iowa State University, Ames; unpublished data).

Transportation losses are a multifactorial problem and include the human-animal interaction, the environment, and the individual pig. Pork producers have implemented numerous techniques or standard operat-

[1]The authors acknowledge personnel at the commercial abattoir that recorded and compiled data for this study.

[2]Corresponding author: stalder@iastate.edu

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Table 1. Description of variables recorded per trailer load[1] of pigs during a 1.5-yr study of factors that increase fatigued, injured, and dead pigs during transport and lairage at a commercial abattoir

Variable	Description	Units	Number of levels
Categorical			
Week	Week of year marketed	Week	52
Farm	Farm of pig origin	Farm	9
Loadtype	Pigs transported from single (normal) or multiple (split) barns	Barns	2
Driver	Driver of the trailer load	Drivers	29
Trailer	Manufacturer of trailer	Manufacturers	2
Sort	Order of pig selection and removal from barn; first or second	Sort	2
RecCrew	Unloading crew at the abattoir; day and night crew	Crew	2
LoadCrew	Load crew at farm	Crew	11
Distance	Distance transported from a farm to the abattoir	km	3
Continuous			
LWT	Average BW of pigs measured at abattoir	kg	—
HOGS	Number of pigs per trailer load	pigs	—
REST	Lairage time at the abattoir	h	—
LTPP	Load time per pig of each trailer load at the farm	min/pig	—
WaitTime	Time between arrival and unloading of each trailer load of pigs at the abattoir	min	—
Density	Total kilograms of BW divided by available trailer space	kg/m^2	—
Weather[2]			
Temp	Temperature	°C	—
RH	Relative humidity	decimal	—
DewPt	Dew point	°C	—
Bpressure	Barometric pressure	mmHg	—
WindD	Wind direction	—	8
WindS	Wind speed	m/s	—
WindG	Wind gusts	m/s	—
THI	Temperature-humidity index	—	—

[1]Each variable was recorded for each trailer load of pigs from May 2005 to August 2006 (n = 12,333 trailer loads of pigs (n = 2,053,945 pigs). Trailer loads with incomplete data were removed from analyses.

[2]Weather data were collected at the abattoir every 15 min. Trailer loads were assigned the closest logged weather data.

ing procedures to reduce the incidence of fatigued, injured, and dead market pigs. For example, producers have been certified through the National Pork Board's Transport Quality Assurance Program. This program was designed to teach producers the best methods for loading and transporting pigs to minimize associated pig injury, fatigue, and death (NPB, 2008). However, many questions still remain in regard to the factors associated with transport losses. The objective of this study was to identify environmental and managerial factors associated with the incidence of the fatigued, injured, and dead market weight pigs during transport to and lairage at a commercial abattoir.

MATERIALS AND METHODS

Animal care and use approval was not obtained for this study because the data were provided to the researchers from an existing database.

Pig Transportation

Data were collected by a large integrated Midwestern pork producer from May 2005 to August 2006. A total of 2,053,945 market pigs (n = 12,333 trailer loads of a mix of barrows and gilts) from 9 farms were transported to a single abattoir. Categorical and continuous variables recorded for each trailer load of pigs transported to the abattoir are listed in Table 1.

Multiple 1,000- to 1,150-pig, grow-finish barns were located on each of the 9 farms represented in this study. Each finisher barn contained pens on both sides of a center walkway that was utilized by loading crews to move pigs to the trailer on the day of marketing. The standard operating procedure for loading trailers required the 4-person crew to cooperatively move pigs from the pens to the rear of the trailer in groups of 5 or less. Crew members were allowed minimal use of electric prods. The loading crews moved to multiple barns on the same farm until the desired number of pigs for that load was reached. When pigs were loaded onto trailers from multiple barns located on a single farm (load type), the loads were designated as split loads. The amount of time required for the trailer to move between barns during a split-load type was included in total load time estimates.

Pigs were removed from the barns in 3 sorts. Loads consisting of pigs removed from the barn on the second sort (n = 245) were removed due to the relatively small number and clustering of observations during the beginning of the study. Criteria were imposed for farms and drivers to be included in the analysis. Each farm must have had produced >50 loads of pigs from both the first and third pulls. This reduced the number of farms from 37 to 9. Trailer drivers must have delivered pigs from at least 5 of the 9 farms, transported >50 loads of pigs, transported pigs from at least 2 farms within a week for at least 5 wk of the year, and trans-

Table 2. Means of weather variables[1] recorded for trailer loads of pigs during a 1.5-yr study of factors that increase fatigued, injured, and dead pigs during transport and lairage at a commercial abattoir

Variable	Model parameter	n	Mean	SD	Minimum	Maximum	PRESS[2]	AIC[3]
Temperature, °C	—	12,333	12.69	10.88	−21.78	36.13	—	—
RH,[4] decimal	—	12,333	81.81	17.57	25.25	100.00	—	—
Dew point, °C	—	12,333	9.51	11.01	−24.39	29.78	—	—
Barometric pressure, mmHg	—	11,992	737.64	5.14	716.20	757.82	—	—
Wind speed, m/s	—	12,333	1.62	1.46	0.00	10.37	—	—
Wind gust, m/s	—	12,333	3.31	2.64	0.00	20.79	—	—
THI[5] 1959	Linear	12,333	54.98	17.58	−3.31	87.06	7,280.26	31,937.62
THI 1971a	Linear	12,333	54.99	17.60	−3.34	87.11	7,280.27	31,937.56
THI 1971b	Quadratic	12,333	65.49	14.54	19.62	93.79	7,292.84	31,933.77
THI 1971c	Linear	12,333	78.39	17.81	22.18	113.37	7,291.39	31,975.82
THI 1976	Quadratic	12,333	12.78	9.78	−19.63	30.62	7,281.09	31,923.02
THI 1985	Quadratic	12,333	57.31	14.65	11.10	85.85	7,281.43	31,933.68
Humidity index—1990	Linear	12,333	104.86	58.00	55.64	511.54	7,290.03	31,992.62

[1]Weather data were measured and recorded using a remote HOBO weather station (Onset Computer Corp., Bourne, MA) located at the abattoir. HOBO weather stations were set to record weather observations every 15 min.

[2]Predicted error sums of squares = sum of squared residuals (residuals = the observed value minus the predicted values from the model). Error sums of squares was calculated for each THI in the validation data set (n = 2,682).

[3]AIC = Akaike's information criterion.

[4]RH = relative humidity.

[5]THI = temperature-humidity index.

ported pigs for at least 2 wk from at least 5 farms. The removal of second sort, farms, and drivers decreased the number of observations in the formulation data set from 11,451 to 9,651. The total number of loads of pigs equaled 12,333.

Pigs were transported to the abattoir in straight deck, side-unloading trailers manufactured by 2 different companies [total floor space equaled 73.52 m^2 for trailer 1 (Barrett Trailers, Purcell, OK) and 72.84 m^2 for trailer 2 (Wilson Trailers, Sioux City, IA)]. Each trailer had 2 decks with diamond-plated flooring and an internal ramp located at the rear of the trailer for pig movement between decks during loading. Unloading of the trailer was accomplished using 3 doors located on the side of the trailer (1 on the top deck and 2 on the bottom deck). Pigs from each deck were unloaded at different locations at the abattoir. These locations at the facility were specific to the heights of the upper and lower decks of the trailer, thus allowing pigs to be unloaded without using ramps. Electrical prods were not used during unloading of the market pigs. Both trailers utilized natural ventilation and followed the procedures of the farm for weather changes. Environmental conditions in the lairage pens were controlled by internal fans, heaters, and misters.

Pig Description

Fatigued, injured, and dead pigs on arrival and in lairage were counted by abattoir personnel that undergo the animal handling training of the company. These workers are specifically trained to identify and prevent stressors during the unloading and movement of pigs throughout the facility. All data were collected at 1 abattoir where all identification and recording were standardized.

Fatigued pigs for this study were defined as nonambulatory, noninjured, and often displayed open-mouthed breathing, blotchy red skin, and muscle tremors (Benjamin, 2005). Pigs were recorded as injured if the pig displayed an obvious injury that prevented normal movement. Pigs that were fatigued or injured on arrival at the abattoir but later died in the pen were recorded as dead. Fatigued, injured, and dead pigs were counted both during unloading of the trailer at the abattoir and in the lairage pen before processing. Pig losses were collected and recorded until the pigs were moved from the lairage pen to the stunning area. Pig losses during loading at the farm and unloading and resting at the abattoir were summed to form a new variable termed total losses.

Weather Data Measurement

Weather data were measured and recorded using a remote HOBO weather station (Onset Computer Corp., Bourne, MA) located at the abattoir. The weather station was fitted with sensors that measured barometric pressure (mmHg), temperature (°C), relative humidity (**RH**, %), wind speed (m/s), and wind direction (m/s). Both the temperature and RH sensors were protected from solar radiation by a shield. The weather station was set to record weather observations every 15 min. Each trailer load of pigs was assigned to the closest weather data time logged, which corresponded to the time the load of pigs arrived at the abattoir. Weather data for the entire study are summarized in Table 2. Weather observations with greater than 100% RH val-

ues were set to equal 100%. Relative humidity values greater than 100% may have occurred as a result of super saturation of the air or as a result of the accuracy of the instrumentation (±3%; 103% RH is within the accuracy of the instrument).

Temperature and RH and interactions between the 2 variables were fit into the reduced final model as linear and quadratic covariates. Additionally, 7 temperature humidity indices were calculated and were included in the reduced final model in place of temperature and RH. The index or covariates that yielded the least predicted residual sums of squares (**PRESS**) in the validation data as well as minimized the Akaike's information criteria (**AIC**) value was used as the THI of choice for the present study. Temperature (T) and dew point (T_{dp}) are expressed in degrees Celsius and RH as a decimal (RH_{dec} = RH/100).

$$THI1959 = (0.8 \times T) + [RH_{dec} \times (T - 14.4)] + 46.4$$

(Gaughan et al., 2008; adapted from Thom, 1959).

$$THI1971a = [1.8 \times T + 32] - [0.55 - (0.0055 \times RH)] \times [1.8 \times T - 26]$$

(Bohmanova et al., 2008; from NRC, 1971).

$$THI1971b = (0.55 \times T + 0.2 \times T_{dp}) \times 1.8 + 32 + 17.5$$

(Bohmanova et al., 2007; from NRC, 1971).

$$THI1971c = 0.81 \times T + 0.143 \times (RH_{dec} \times 100) + 0.0099 \times (RH \times 100) \times T + 46.3$$

(Bohmanova et al., 2007; from NRC, 1971).

$$THI1976 = T - \{[0.55 - (0.0055 \times RH)] \times (T - 14.5)\}$$

(NOAA, 1976).

$$THI1985 = T + 0.36 \times T_{dp} + 41.2$$

(Yousef, 1985).

$$HI1990 = -42.379 + [2.04901523 \times (T \times 1.8 + 32)] + (10.14333127 \times RH) - [0.22475541 \times (T \times 1.8 + 32) \times RH] - \{0.00683783 \times [(T \times 1.8 + 32)^2]\} - [0.05481717 \times (RH^2)] + \{0.00122874 \times [(T \times 1.8 + 32)^2] \times RH\} + [0.00085282 \times (T \times 1.8 + 32) \times (RH^2)] - \{0.00000199 \times [(T \times 1.8 + 32)^2](RH^2)\}$$

(Rothfusz, 1990).

Statistical Analysis

Two data sets were created from the original data that were used for formulation and validation of a model to predict percent total losses per trailer. The formulation data set included observations from 1 yr beginning in May 2005 and ending in the following April 2006 (n = 9,651), whereas the validation data included observations from April 2006 to mid-August 2006 (n = 2,682).

Simple means were calculated for fatigued, injured, and dead pigs (MEANS procedure; SAS Inst. Inc., Cary, NC). Simple means were calculated using data from the entire 1.5-yr study period.

A trailer load of pigs served as the experimental unit in this study. Analysis of the total transport losses per trailer was performed using a generalized mixed model (GLIMMIX procedure, SAS Inst. Inc.). The GLIMMIX procedure uses a log-transformation to transform the data that approximated a Poisson distribution before performing statistical analysis. An offset variable, the log of the total number of hogs per trailer, was used to standardize the number of transport losses to the number of pigs on each trailer load. Thus, results in the present study are presented on a percentage basis [number of transport losses/total number of pigs on trailer × 100]. The ILINK option (SAS Inst. Inc.) was used to back-transform least squares means into their original unit of measure for ease of interpretation. Trait means correspond to the geometric mean of the population ($\sqrt[n]{a_1 \cdot a_2 \cdot a_n}$, where a equals the percentage total losses per trailer n). Additionally, a backward stepwise procedure was established to remove variables that did not account for significant variation. The single variable accounting for least amount of variation for each model was removed, and the model was reanalyzed until all variables were significant at $P = 0.10$ level. The significance level for variables to remain in the model was set at the 0.10 level to prevent premature removal of variables that may have biological impact on pig losses previously evaluated in the literature.

RESULTS AND DISCUSSION

Simple means for total losses per trailer load and associated transport variables are listed in Table 3. A total of 17,393 fatigued (n = 11,192), injured (n = 1,045), and dead (n = 5,156) pigs were observed for the time period of the analysis, averaging 0.85% pig losses (median = 0.60%) per trailer load of pigs transported to the abattoir. Fatigued, injured, and dead pigs averaged 0.55, 0.05, and 0.25% per trailer load of pigs, respectively. In a review of transport losses across 22 commercial field trials containing a total of 4,607,567 pigs, Ritter (2008) reported averages of 0.37, 0.25, and 0.62% for nonambulatory, dead, and total transport losses, respectively. Whereas average losses per trailer in this study were greater than those reported by Rit-

Table 3. Simple means of variables recorded for trailer loads of pigs[1] transported to a commercial abattoir

Variable	Mean	SD	Minimum	Maximum	Median
Pigs per trailer	166.54	2.60	156.00	178.00	168.00
Average BW, kg	117.78	6.74	92.70	148.20	117.60
Distance transported, km	72.26	47.23	33.80	159.33	49.89
Losses per trailer, pigs	1.41	1.85	0.00	19.00	1.00
Losses per trailer,[2] %	0.85	1.11	0.00	11.45	0.60
Fatigued pigs per trailer, %	0.55	0.84	0.00	7.78	0.00
Injured pigs per trailer, %	0.05	0.19	0.00	2.41	0.00
Dead pigs per trailer, %	0.25	0.47	0.00	5.36	0.00

[1]Data represent 12,333 trailer loads of pigs (n = 2,053,945 pigs).
[2]Total losses, % = (fatigued + injured + dead)/pigs per trailer.

ter (2008), they are within the range of transport losses observed in that study (0.14 to 2.39%). Dead pig averages were equal between this study and those reported by Ritter (2008). Fatigued and injured pig averages in this study were larger by 0.31 and 0.01% from those trials reported by Ritter (2008) that separated nonambulatory pigs into fatigued and injured categories. The difference may be attributable to varying definitions of a fatigued pig between the personnel recording fatigued pig data in the 2 studies.

Model Selection for Total Losses

Rest time at the abattoir was initially included as a linear covariate in the model predicting total losses per trailer load of pigs. In an analysis of transport losses on arrival at the plant (not reported), rest time was observed ($P < 0.0001$) to be associated with transport losses. This result may erroneously contribute to the association of rest time with total losses per trailer. Rest time was removed from the prediction model before any backward selection was performed. In that same analysis of losses on arrival, receiving crew was not associated with transport losses. This lends evidence to the true association of receiving crew at the abattoir with total losses per trailer. Furthermore, all remaining effects in the final model could logically be associated with total losses.

Of the remaining 9 fixed and 8 regression effects (the final model listed below plus 4 insignificant effects), the linear covariate wind gust ($P = 0.72$), the linear covariate distance transported ($P = 0.46$), trailer ($P = 0.43$), and wind direction ($P = 0.13$) were removed sequentially from the final model as a result of backward selection. There was no evidence in this study that these 4 variables were associated with percentage of losses per trailer. Confounding or collinearity (Dohoo et al., 1996) among effects simultaneously included in the model may have played a role in these variables not contributing significant variation. For example, the Pearson correlation coefficient for wind gust and wind speed was 0.96. After removing variation attributable to wind speed, wind gusts accounted for little variation. For each trailer load of pigs transported, wind gusts averaged 1.68 m/s (0.011 m/s SEM) faster than the observed wind speed.

A similar result was observed when including farm and distance traveled as a fixed effect and covariate in the model, respectively. Each farm only had 1 distance to the abattoir, and few distances had more than 1 farm. Thus, the linear covariate distance was removed from the model.

Two trailer manufacturers were represented in this study. After total pig transport weight was adjusted for trailer space [trailer density (kg/m^2)] and included as a linear covariate in a model to evaluate pig losses, there was no evidence that trailer type was associated with total losses.

The final 13-variable prediction model for percent total losses was the following:

$$y_{ijklmnop}/log(n\ of\ hogs\ per\ trailer) = week_i + farm_j + trailer\ driver_k + sort_l + loadcrew_m + loadtype_n + reccrew_o + trailer\ density + load\ time\ per\ pig + THI1976_{linear} + THI976_{quadratic} + wind\ speed + wait\ time + e_{ijklmnop},$$

where $y_{ijklmnop}$ is the total number of fatigued, injured, and dead pigs per trailer load for week (i = 18 of 2005 to 17 of 2006), farm (j = 1,..., 9), trailer driver (k = 1,..., 29), sort from barn (l = 1, 2), trailer load crew at the farm (loadcrew; m = 1 to 11), 1 or multiple barns per farm (loadtype; n = single or multiple), and receiving crew at the abattoir (o = day or night).

The ANOVA for the model above is listed in Table 4. Trailer density accounted for the largest portion of variation in percentage defect. A trend ($P = 0.052$) was observed in this study for the effect of wait time before unloading at the abattoir on total losses per trailer.

Farm and Distance from the Abattoir

Farm was included in the final model and was found to account for variation ($P < 0.001$) in percentage total losses. This observation was expected because farms were managed by individual operators and may have

Table 4. Analysis of variance table produced from a model predicting total losses[1] per trailer[2] during transport and lairage at a commercial abattoir

Variable[3]	Numerator degrees of freedom	*F*-value	Probability
Week	51	6.77	<0.0001
Driver	28	2.25	0.0002
Farm	8	14.77	<0.0001
Load crew	10	11.70	<0.0001
Sort of barn	1	229.29	<0.0001
Load type	1	16.98	<0.0001
Receiving crew	1	9.18	0.002
Trailer density	1	546.78	<0.0001
THI_{linear}[4]	1	7.30	0.007
$THI_{quadratic}$	1	10.58	0.001
Wind speed	1	4.13	0.04
Load time per pig	1	14.18	<0.001
Wait time	1	3.76	0.05

[1]Total losses, % = (fatigued + injured + dead)/pigs per trailer.
[2]Data represent 9,651 trailer loads of pigs from May 2005 to April 2006. Denominator df = 9,544.
[3]Variable descriptions are listed in Table 1.
[4]THI = temperature-humidity index.

contributed different management effects for the pigs. Least squares means for percentage total losses by farm (Figure 1) appear to mimic a tiered pattern. Of the 9 farms, 2 farms averaged greater than 1.0% losses, whereas the next tier of farms begins at 0.71% and proceeds to 0.59%, with the last tier of farms averaging below 0.5% total losses. All farms were located between 34 and 160 km from the abattoir. As an alternative to adding the linear covariate distance, a categorical variable was created with 3 levels of distance [0 to 40 km (n = 5,548 loads, 4 farms), 40 to 80 km (n = 3,879 loads, 3 farms), and >80 km (n = 2,906 loads, 2 farms)]. The 2 farms (farm 1 and 2) averaging greater than 1.0% total losses per load were the 2 farms located greater than 80 km (average distance = 153 km) from the abattoir. Conversely, 2 of the 3 farms (farms 8 and 9) located between 40 and 80 km (average distance = 65 km) of the abattoir averaged less than 0.5% total losses per load. Contrasts between farms of different distances were performed. Farms at distances between 40 and 80 km (farms 5, 8, and 9) averaged the least ($P < 0.01$) total losses of all distances. Farms located within 40 km of the abattoir (farms 3, 4, 6, and 7; average distance = 35) numerically averaged fewer ($P = 0.14$) total losses than farms at distances greater than 80 km.

Although farm was included in the model to remove variation due to farm level effects, it is important to identify those farms and their practices that yield large numbers of total losses so they may modify procedures to reduce total losses.

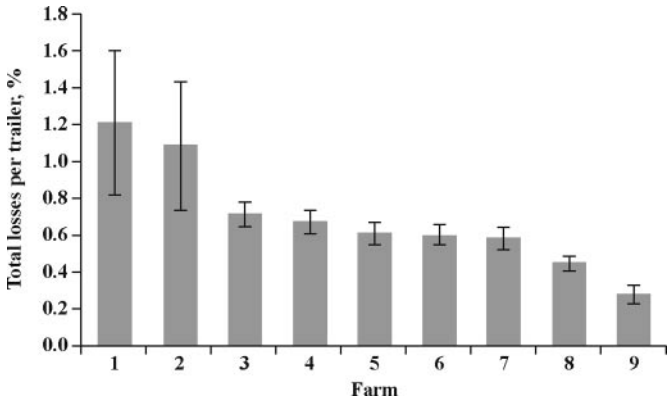

Figure 1. Least squares means of percentage of fatigued, injured, and dead pigs (termed total losses) per trailer load of pigs originating from 9 farms of a Midwest US pig company.

Sort from Barn

Pigs were removed from a growing-finishing barn in 2 or 3 phases (sorts). Pigs removed from the barn during the first sort averaged fewer ($P < 0.001$) losses than the third sort (0.51 and 0.78%, respectively). The observed difference in sort from barn may be attributed to slower growing (i.e., pigs that take approximately 10 to 20 d longer to market weight) or unhealthy pigs. Additionally, the inclusion of Paylean (Eli Lilly and Co., Indianapolis, IN) in the ration for third sort pigs may have contributed to an increase in percentage total losses.

Trailer Density

Log-linear predictions (Ramsey and Schafer, 2002) for trailer losses at different trailer densities are shown in Figure 2. Trailer density accounted for the largest portion of variation ($P < 0.001$) in total losses per trailer load. In this study, increasing trailer density by 50 and 100 kg/m^2 was associated with a 0.53 and 0.74% increase in total losses per trailer, respectively. Moreover, increasing trailer density from the minimum (212.38 kg/m^2) to the maximum (338.64 kg/m^2) density was associated with a 7.55-fold increase in total losses. Figure 3 estimates the associated risk of changing pigs per square meter at different average BW, or alternatively, the favorable change in percentage losses by decreasing

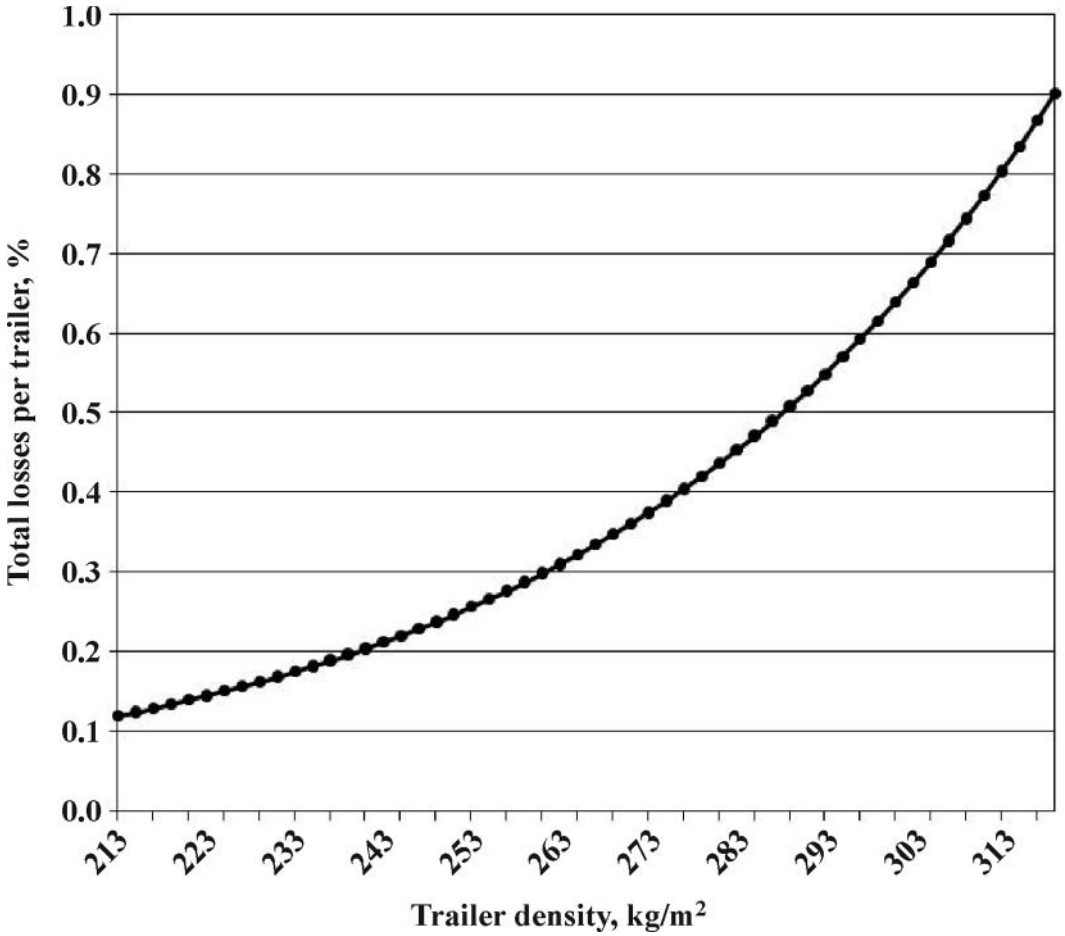

Figure 2. Linear regression of percentage of fatigued, injured, and dead pigs per trailer load of pigs transported to a commercial abattoir at different trailer densities, based on 9,651 trailer loads. Standard error of the β coefficient = 0.00082 on the log-linear scale.

pigs per square meter at different BW. For example, a producer averaging 1.0% losses per trailer load could decrease transport losses by decreasing pigs per square meter, decreasing average BW, or both. Once available transport space and acceptable risk has been determined, a pork producer can easily calculate the optimal number of pigs per load by multiplying the available space by pigs per square meter.

The results in the present study are similar to those reported by Ritter et al. (2006) where they transported finishing pigs to the abattoir under 2 trailer densities (0.39 or 0.48 m^2/pig; BW = 129.0 kg). In that study, Ritter et al. (2006) found that total injured pigs, fatigued pigs, and total losses were reduced by 0.35, 0.37, and 0.52%, respectively, when pigs were allowed more transport space during transport to the abattoir. A similar study by Ritter et al. (2007) reported that 0.462 m^2/pig (BW = 131.2 kg) trailer space of the 6 compared allotments (0.396, 0.415, 0.437, 0.462, 0.489, and 0.520 m^2/pig) minimized transport losses. Transport space was expressed in the present study as kilograms per square meter, which facilitates prediction of transport losses using estimated BW. Each trailer load of pigs (averaging 73.09 m^2 and 19,614.90 kg of total BW) averaged 0.485 m^2 of trailer space (averaged 130 kg/pig).

Season

Pigs were marketed between May 2005 and April 2006 in the formulation data set. Least squares means for week of the year marketed are shown in Figure 4. Week of the year was found to affect ($P < 0.001$) the percentage of losses per trailer load. A fourth-order polynomial trend line was fit through the least squares means to more clearly observe the cyclical pattern of total losses throughout the year. The 2 wk that incurred the greatest percentage of losses per trailer were wk 50 and 52 (the second and last week of December). Conversely, the 2 wk with the least percentage losses per trailer were wk 26 and 28 (the last week in June and second week in July). Similarly, pigs transported to the abattoir in the months of June and July experienced fewer losses ($P < 0.001$) when compared with pigs that were transported during the months of November and December.

Pig market weights tend to increase during the winter months and as well as the total number of pigs marketed (Meyer, 2008), and the same trend in average BW was observed in this study. More pigs transported to market would inherently increase the risk during those times of the year (M. Ritter, Elanco Animal Health, Greenfield, IN, personal communication). In this study, the average total losses per week follows the observed

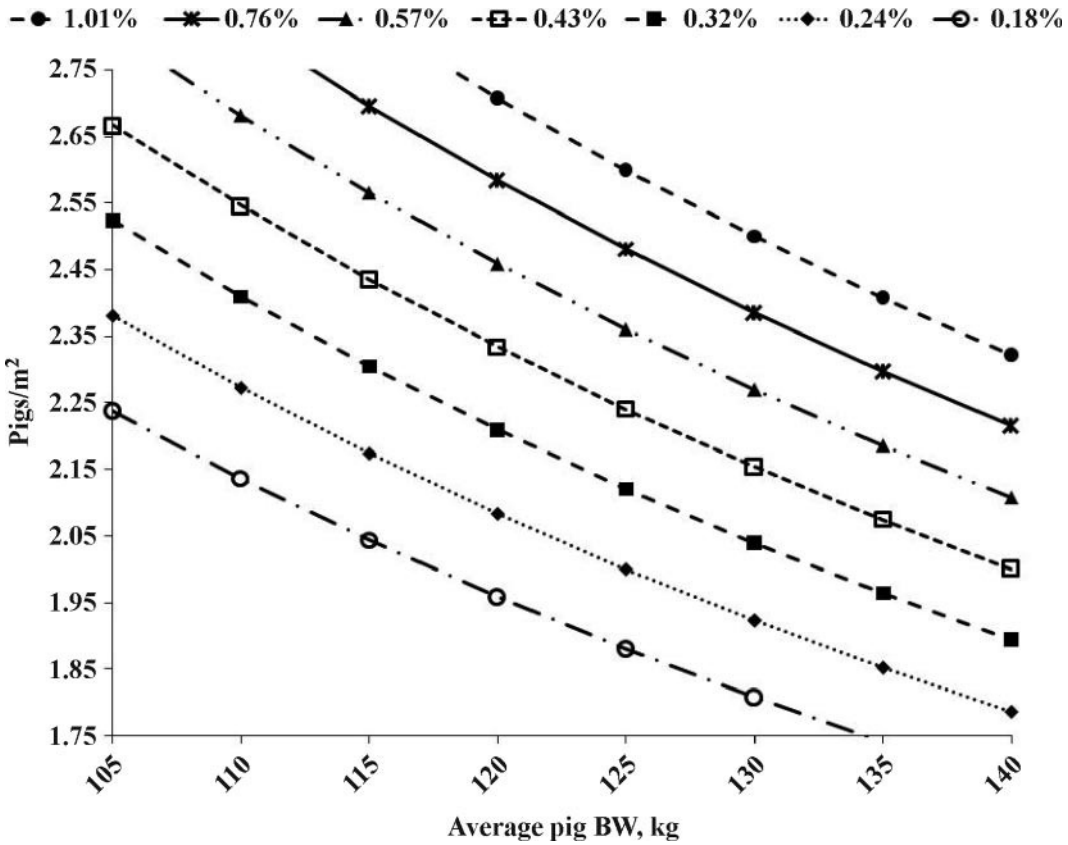

Figure 3. Predicted total losses (%, total losses = fatigued + injured + dead pigs) at different average pig BW and trailer densities (kg/m^2) derived from a study of factors that increase total losses during transport and lairage at a commercial abattoir. Predictions were calculated by dividing the trailer density at different predicted losses by different average pig market weights.

trend in average pig BW per trailer per week (Figure 4). Pig market BW was an average 7.62 kg less ($P < 0.0001$) for wk 23 through 34 as compared with wk 48 through 7. The cyclical pattern in total losses per trailer throughout the year has been observed by other researchers (Rademacher and Davies, 2005).

When plotting fatigued, injured, and dead pig simple means per week in this study, fatigued pigs represented the greatest portion of total losses during the winter months, whereas dead pigs were greatest during summer months. This may be the result of pigs becoming subclinically fatigued during transport and later dying in the pen at the abattoir, thus being recorded as a dead pig. Whereas during the winter months, fatigued pigs may recover given sufficient time (M. Ritter, Elanco Animal Health, Greenfield, IN, personal communication). The percentage of injured pigs was relatively consistent throughout the year when compared with the percentage of fatigued or dead pigs with the least frequency occurring during the spring months.

Temperature, RH, and Their Index

The temperature quadratic covariate and the RH linear covariate were sources of variation ($P < 0.01$, $P = 0.04$, respectively) in the model predicting percentage total losses. The interaction between the linear temperature and RH covariates did not ($P = 0.89$) affect trailer losses. Several temperature-humidity indices have been calculated to predict future stress as a result of interactions between temperature and humidity (Thom, 1959; NOAA, 1976; Yousef, 1985). Each of the 7 THI equations was individually fit into the model as first linear and then quadratic covariates (if the linear was $P < 0.05$). Both the linear and quadratic covariates of THI1971b, THI1976, and THI1985 were sources of variation. Only linear covariates were fitted into the model for the remaining THI. Total losses were predicted for trailer loads of pigs in the validation data, and PRESS and AIC values for each THI are listed in Table 2. Similar results were found between all THI with an observed difference in PRESS of 29.17 between the least and best predictive THI in the validation data set. The THI1976 yielded the lowest PRESS and AIC values of all calculated THI equations.

Evidence was found in this study for the THI1976 quadratic covariate accounting for variation in percentage losses per trailer. Two observations are apparent from Figure 5. First, relative to trailer density, THI1976 was associated with a smaller magnitude of percent total losses, as shown on the y-axis. The difference between the largest and smallest value is 0.0018%, which represents a 2.13-fold increase. This may be a result of week being fit simultaneously in the model; that is, once seasonal variation in percent total losses is removed because of week, then THI contributes to

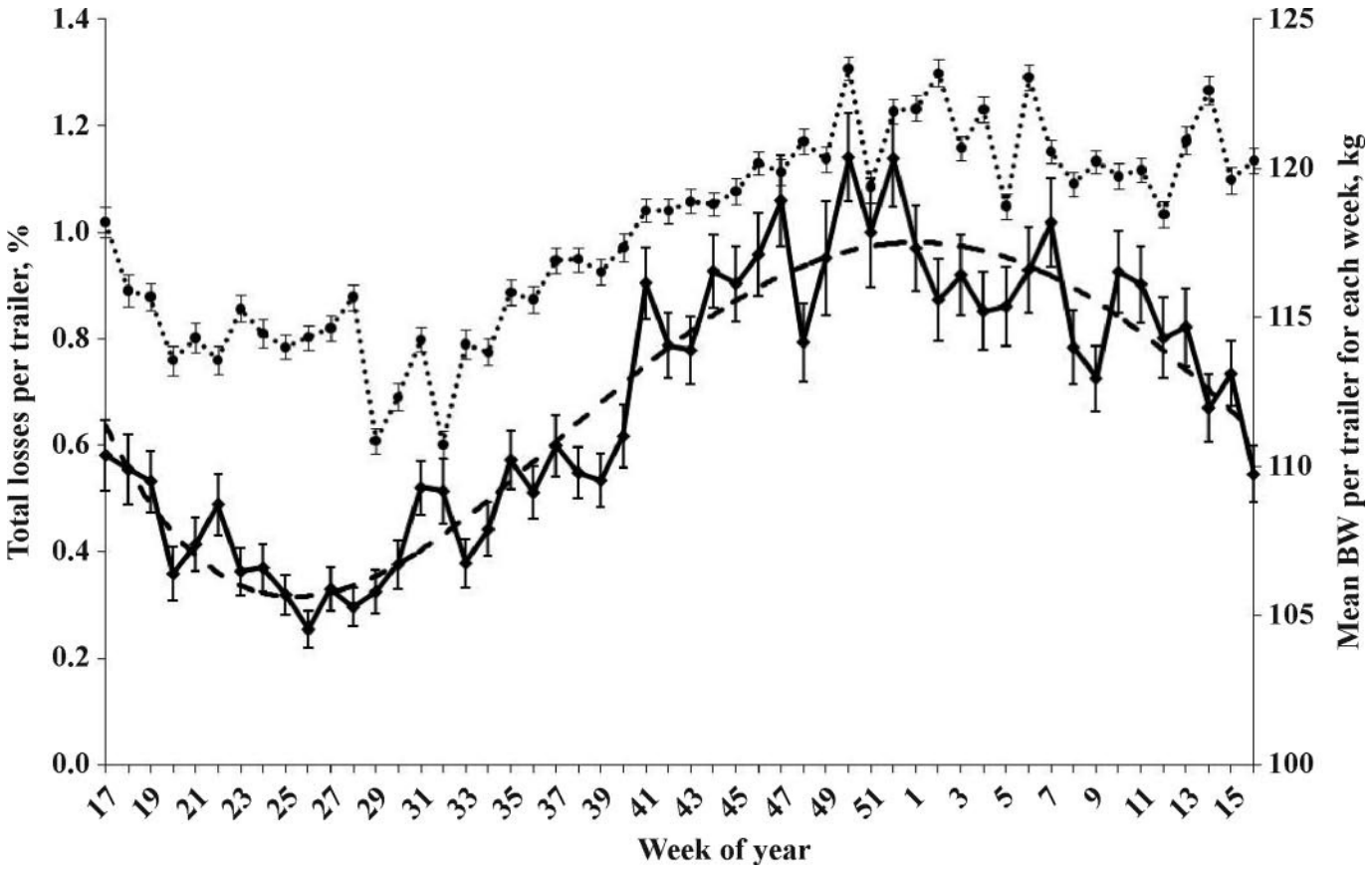

Figure 4. Least squares means of pig losses per trailer [fatigued, injured, and dead pigs (%); ◆], a fourth-order polynomial trend line (- - -; R^2 of the trendline = 0.89) of percentage losses per trailer, and mean BW (●) for trailer loads of pigs per week transported to a commercial abattoir from May 2005 to April 2006.

variation but at a decreased magnitude compared with season. Second, THI values of −19 (the minimum THI value in this data set) and 1 were associated with equal percent total losses. After the THI value of 1, increasing THI to the maximum calculated value of 30 was associated with a 2.19 increase (0.0025%) in total losses. Yet, this observation does not take away from the importance of proper management during both hot and cold weather extremes.

Other abattoirs and producers might have different results than those found in this study and should consider developing similar equations to fit their conditions. St-Pierre et al. (2003) reported that heat stress is the probable cause of 0.2 to 5.9 pig deaths per thousand pigs produced annually and reduces efficiency by 0.4 to 7.2 kg/(pig·yr) depending upon the production region. Trailer drivers need to be cognitive of weather changes from both warm to cold and cold to warm weather and add or remove air inlet covers, respectively, throughout the day (NPB, 2008).

There was a trend ($P = 0.05$) for the interaction between the linear covariates density and THI1976 with total losses and no evidence ($P = 0.30$) when the quadratic THI covariate interaction was included. Further, an increase in AIC was observed when including the interaction term. Therefore, the interaction between density and THI1976 was removed to predict each variable independently.

Wind Variables

The presence of wind can be beneficial during hot weather and dangerous to animal welfare during cold weather if proper precautions are not taken (NPB, 2008). In the present study, wind speed was associated ($P = 0.04$) with the total percentage of losses per trailer load, and an observed trend in plotted data confirms this association (data not shown). An increase in wind speed from 0 to 7 m/sec was associated with a decrease in total losses by 0.00025%.

A study conducted by Mader et al. (2006) reported that an increase in wind speed by 1 m/s decreased THI by 3.14 units. Interactions of wind speed with quadratic THI1976 ($P = 0.33$) and wait time at the abattoir before unloading ($P = 0.93$) were originally included in the model but were removed as a result of backward stepwise elimination.

McFarlane (1989) reported a relationship between multiple stressors on chick growth. This study found one stressor such as disease, high temperature, or ammonia decreased chick gain by 9%. The simultaneous addition of 6 stressors decreased performance by 62%.

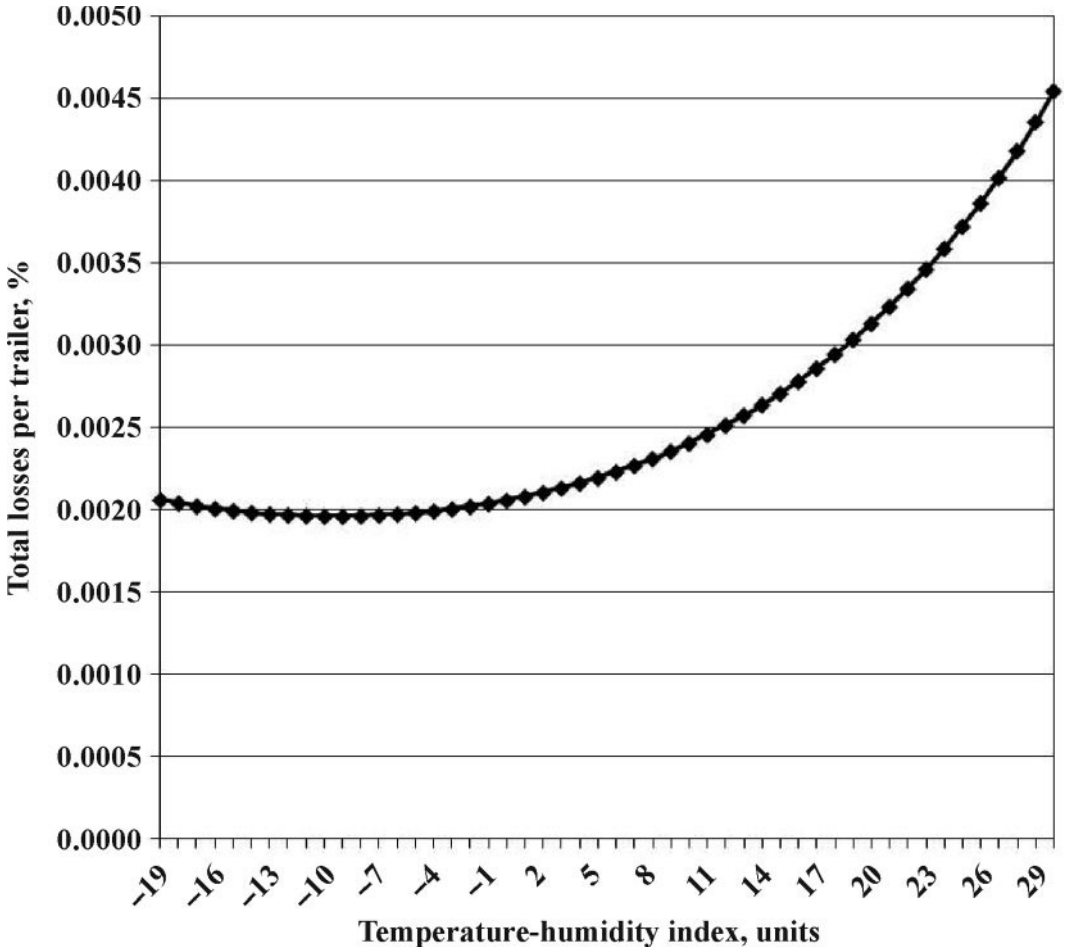

Figure 5. Least squares means of pig losses per trailer (fatigued, injured, and dead pigs) for incremental unit increases in temperature-humidity index (THI) for 9,651 trailer loads of pigs during transport and lairage at a commercial abattoir. Standard error of the THI_{linear} and $THI_{quadratic}$ β coefficients = 0.0038 and 0.00017, respectively, on the log-linear scale.

If one were to assume the same additive effects of stressors in pigs, removing or reducing 1 stressor, even of small magnitude, should result in a favorable improvement in transport losses. In conclusion, transport losses are a multi-factorial problem, and trailer density, sort from barn, season, and weather variables were identified in this study as large sources of variation in total losses per trailer.

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ATTACHMENT 10

Effect of floor space during transport of market-weight pigs on the incidence of transport losses at the packing plant and the relationships between transport conditions and losses[1]

M. J. Ritter,* M. Ellis,*[2] J. Brinkmann,† J. M. DeDecker,* K. K. Keffaber,‡ M. E. Kocher,*[3] B. A. Peterson,* J. M. Schlipf,* and B. F. Wolter†

*Department of Animal Sciences, University of Illinois, Urbana 61801; †The Maschhoffs Inc., Carlyle, IL 62231; and ‡Elanco Animal Health, Greenfield, IN 46140

ABSTRACT: Data on 74 trailer loads of finishing pigs (mean BW = 129.0, SEM = 0.63 kg) from wean-to-finish buildings on 2 farms within 1 production system were collected to investigate the effect of amount of floor space on the trailer (0.39 or 0.48 m^2/pig) during transport on the incidence of losses (dead and nonambulatory pigs) at the packing plant and to study the relationships between transport conditions and losses. Pigs were loaded using standard commercial procedures for pig handling and transportation. Two designs of flat-deck trailers with 2 decks were used. Floor space treatments were compared in 2 similarly sized compartments on each deck of each trailer type. Differences in floor space were created by varying the number of pigs in each compartment. The incidence of nonambulatory pigs at the farm during loading and at the plant after unloading, average load weight, load number within each day, event times, and temperature and relative humidity in the trailer from loading to unloading were recorded. Of the 12,511 pigs transported, 0.26% were nonambulatory at the farm, 0.23% were dead on arrival, and 0.85% were nonambulatory at the plant. Increasing transport floor space from 0.39 to 0.48 m^2/pig reduced the percentage of total nonambulatory pigs (0.62 vs. 0.27 ± 0.13%, respectively; $P < 0.05$), nonambulatory, noninjured pigs (0.52 vs. 0.15 ± 0.11%, respectively; $P < 0.01$), and total losses (dead and nonambulatory pigs) at the plant (0.88 vs. 0.36 ± 0.16%, respectively; $P < 0.05$) and tended to reduce dead pigs (0.27 vs. 0.08 ± 0.08%, respectively; $P = 0.06$). However, transport floor space did not affect the percentage of nonambulatory, injured pigs at the plant. Nonambulatory pigs at the farm were positively correlated with relative humidity during loading and load number within the day (r = 0.46 and 0.25, respectively; $P < 0.05$). The percentage of total losses at the plant was positively correlated to waiting time at the plant, unloading time, and total time from loading to unloading (r = 0.24, 0.51, and 0.36, respectively; $P < 0.05$). Average temperature during loading, waiting at the farm, transport, waiting at the plant, unloading, and average pig weight on the trailer were not correlated to losses. These results suggest that floor space per pig on the trailer and transport conditions can affect transport losses.

Key words: floor space, nonambulatory, pig, transport, welfare

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INTRODUCTION

Losses of pigs (dead and nonambulatory) during transport are of great concern from animal welfare and economic perspectives. Based on several field studies, the incidence of transport losses in market-weight pigs is approximately 1% (Ellis et al., 2003, 2004). Transport losses may be influenced by numerous factors including genetics, carcass muscling, health status, structural soundness, BW, nutrition, handling, facility design, and conditions during transport to the plant. Few, if any, of these factors have been examined under typical commercial conditions in the United States.

Floor space (stocking density) during transport affects pig behavior, welfare, and meat quality (reviewed by Warriss, 1998). Floor space during transport also affects body temperature, heart rate, and respiration rate of market-weight pigs (von Mickwitz, 1982). Sur-

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[2]Corresponding author: mellis7@uiuc.edu

[3]Current address: Premium Standard Farms, Highway 65 North, Princeton, MO 64673.

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vey evidence suggests that overcrowding pigs during transport is associated with greater mortality rates (Robertson, 1987; Guardia et al., 1996; Riches et al., 1996). In practice, floor space available for the pig during transport is determined by the number of animals placed on each load. Currently, the National Institute for Animal Agriculture (2004) recommends floor space allowances of 0.40 to 0.45 m^2/pig for pigs weighing between 114 to 136 kg (equivalent to approximately 0.35 and 0.33 m^2/100 kg of BW, respectively). The objective of this study was to investigate effects of 2 floor spaces (0.39 and 0.48 m^2/pig) during transport, which represent the range currently being used in commercial practice in the United States, on the incidence of dead and nonambulatory pigs and to evaluate relationships between transport conditions and losses. Differences in floor space were achieved by varying the number of pigs loaded onto the trailer, which confounds effects of floor space and number of pigs per compartment. However, this is the approach that will be used to change floor space during transport under practical conditions, which was the objective of this study.

MATERIALS AND METHODS

Experimental Design and Treatments

Two floor space treatments (0.39 and 0.48 m^2/pig) were compared in a split-plot design that utilized 74 trailer loads of finishing pigs. The main plot was the deck of trailer; the subplot was transport floor space; and the trailer load of pigs was the block. Therefore, floor space treatments were compared within each of 2 decks of each trailer load of pigs. The protocol for this project was approved by the University of Illinois Institutional Animal Care and Use Committee.

Animals, Farms, and Pig Handling

The pigs used in this study were market-weight (mean BW 129.0 ± 0.63 kg) barrows and gilts that were the progeny of PIC 337 sires mated to C22 dams (PIC USA, Franklin, KY).

Two farms within the same production system were used. One of the farms had 4 and the other had 2 wean-to-finish buildings. Pigs were raised in mixed-sex pens of 25 to 30 pigs and were fed the same diets during the grow-finish period. Loads from the first farm were taken when the 4 buildings were emptied in April (number of loads = 18) and in late October through early November (n = 24). Loads from the second farm were taken when the 2 buildings were emptied in July (n = 14) and January (n = 18).

The approach to emptying the buildings that was used by this production system was to send the heaviest pigs (approximately 25% of the pigs) from each pen of 25 to 30 pigs to the packing plant at wk 20 postweaning. The remaining pigs were then marketed 3 to 4 wk later. The loads used in this study were taken after the heaviest 25% of the pigs had been removed.

A total of 12,511 pigs were transported. Pigs were loaded by personnel from the University of Illinois, with assistance from farm employees and with the same university personnel being involved for all loads. In summary, groups of 4 to 6 pigs were removed from the pen and were moved down the center aisle of the building and onto the trailer using sorting boards and, if necessary, electric goads. The width of the center aisle in the buildings at the first farm was 56 cm for 2 barns and 81 cm for the other 2 barns, whereas the width of the center aisles for the 2 buildings at the other farm was 81 cm. The angle of the covered ramps used to load pigs onto the trucks at both farms was 10° or less. Groups from 3 or 4 pens were mixed in each compartment on the trailer. The incidence of pigs that became nonambulatory at the farm during loading was recorded. However, only the pigs that became nonambulatory at the farm after loading were transported.

During the July replicate only, all pigs showing physical signs of stress (i.e., open-mouth breathing, skin discoloration, or both) during the loading process were identified by the investigator and marked with a unique color corresponding to the deck of the trailer onto which they were loaded. These animals were monitored on arrival at the plant.

Trailer Design, Floor Space Treatments, and Transportation

Two designs of a standard commercial swine trailer were used. The trailers had 2 decks and were constructed of aluminum with holes in all of the trailer sides for ventilation. The designs were similar except that the dimensions of the compartments (Table 1) and the angle of the internal loading ramp (trailer design 1 = 21° and trailer design 2 = 24°) differed. To account for this difference in compartment sizes, floor space treatments were compared within 2 approximately similarly sized compartments located in the same general area of the trailer on the top and bottom decks (i.e., for trailer design 1, the second and third compartments from the front of the trailer were used; for trailer design 2, the first and third compartments were used). Therefore, the effects of floor space on transport losses at the plant were evaluated on 296 test compartments with 5,409 pigs. The number of trailer loads of pigs transported in trailer designs 1 and 2 were 35 and 39, respectively. Loads were transported on 4 d in replicates 1 (April) and 2 (July) and on 6 and 5 d in replicates 3 (October/November) and 4 (January), respectively. The average number of loads per day was 2.9, with a range of 1 to 7 loads (Table 2).

Differences in floor space (0.39 and 0.48 m^2/pig) were created by varying the number of pigs loaded into each of the 4 test compartments (Table 1). The remaining trailer compartments were stocked at a floor space of approximately 0.45 m^2/pig, which was the standard used by this system.

Table 1. Trailer compartment dimensions[1]

Item	Compartment dimension			0.39 m^2/pig		0.48 m^2/pig	
	Length, m	Width, m	Area, m^2	No. of pigs	Floor space, m^2/pig	No. of pigs	Floor space, m^2/pig
Trailer design 1							
Top deck				—	—	—	—
First compartment	2.98	2.50	7.43	—	—	—	—
Second compartment[2]	3.31	2.50	8.26	21	0.39	17	0.49
Third compartment[3]	3.71	2.50	9.25	24	0.39	19	0.49
Bottom deck							
First compartment	2.98	2.50	7.43	—	—	—	—
Second compartment[2]	3.31	2.50	8.26	21	0.39	17	0.49
Third compartment[3]	3.71	2.50	9.25	24	0.39	19	0.49
Trailer design 2							
Top deck							
First compartment[2]	3.02	2.50	7.56	19	0.40	16	0.47
Second compartment	4.50	2.50	11.25	—	—	—	—
Third compartment[3]	2.63	2.50	6.58	17	0.39	14	0.47
Bottom deck							
First compartment[2]	3.02	2.50	7.56	19	0.40	16	0.47
Second compartment	4.50	2.50	11.25	—	—	—	—
Third compartment[3]	2.63	2.50	6.58	17	0.39	14	0.47

[1]Compartments were numbered consecutively from the front to the rear of the trailer.
[2]Test compartment 1.
[3]Test compartment 2.

After the completion of loading, pigs were transported approximately 3 h (~240 km) to a commercial packing plant. For the loads transported in July, pigs were sprayed with a water mist via a water sprinkling system installed within the trailer for approximately 5 min immediately on arrival at the plant. For the loads transported in January only, some of the air vents were covered (approximately 75%) and sawdust bedding was provided at a depth of approximately 2.54 cm to minimize cold stress.

The timing of all events (loading, waiting period at the farm before transport, transport, waiting period at

Table 2. Descriptive statistics for transport conditions

Event	No. of loads	Mean	SD	Minimum	Maximum
Event time					
Loading, min	74	45.0	7.78	31.0	73.0
Waiting at farm,[1] min	74	4.88	3.85	1.00	21.0
Transport, min	74	192.6	34.9	155.0	426.0
Waiting at plant, min	74	46.9	49.6	1.00	176.0
Unloading, min	74	20.7	8.98	8.00	59.0
Total time,[2] min	74	309.9	63.3	230.0	546.0
Temperature in the trailer by event					
Loading, °C	63	12.2	9.17	–7.91	25.9
Waiting at farm,[1] °C	63	15.5	8.07	–4.71	27.0
Transport, °C	63	12.5	8.06	–4.12	26.3
Waiting at plant, °C	63	13.7	8.64	–4.58	32.3
Unloading, °C	63	15.1	8.59	0.75	32.6
Avg load temperature,[2] °C	63	13.1	8.07	–3.32	28.4
Relative humidity in the trailer by event					
Loading, %	63	69.2	13.3	43.3	98.4
Waiting at farm,[1] %	63	81.3	11.9	44.5	100.0
Transport, %	63	74.7	12.7	40.3	99.7
Waiting at plant, %	63	76.2	14.2	36.0	100.0
Unloading, %	63	75.6	16.3	33.9	100.0
Avg load relative humidity,[2] %	63	74.2	11.4	43.7	99.3
No. of loads per day	—	2.9	1.63	1	7

[1]The time interval between end of loading and beginning of transport.
[2]The time interval from the beginning of loading to the end of unloading.

the plant before unloading, unloading, and total time from loading to unloading) was recorded. A temperature and relative humidity sensor (HOBO H8 Loggers, Onset Computer Corporation, Bourne, MA) was placed between the 2 test compartments on each deck of each trailer to continuously log (1-min intervals) information in the trailers from the beginning of loading to the end of unloading. This information was used to calculate the average temperature and relative humidity for each event during transportation (i.e., loading, waiting at the farm, journey, waiting at the plant, and unloading). Additionally, average BW of pigs on each load (based on the total weight of the load recorded at the plant) and the number of the loads transported within each day of the study were recorded.

Identification of Dead and Nonambulatory Pigs

Drivers unloaded trailers according to the standard procedures for this production system (using a sorting board and, if necessary, an electric goad). Upon completion of unloading, the number of dead pigs was recorded by compartment. Packing plant employees identified nonambulatory pigs in the holding pens and as pigs were moved from the holding pen to the weigh scale. Nonambulatory pigs were defined as pigs that were unable to stand, walk, or keep up with the rest of the group due to injury or fatigue (Anderson et al., 2002; Ellis et al., 2003). Total losses were defined as the sum of dead and nonambulatory pigs at the plant. Nonambulatory pigs at the plant were classified as nonambulatory, injured; or nonambulatory, noninjured (for 65 of the loads only).

Statistical Analysis

Data for transport losses (dead; total nonambulatory; nonambulatory, injured; nonambulatory, noninjured; and total losses) were not normally distributed and, thus, did not meet the assumptions for ANOVA. Therefore, these data were subjected to a χ^2 rank-based transformation using the RANK procedure of SAS (SAS Inst. Inc., Cary, NC). Transformed data were analyzed as a split-plot design with hierarchical nesting using the MIXED procedure of SAS; the main plot was trailer deck, the subplot was transport floor space, and the trailer load of pigs was the block. The model included fixed effects of trailer design, trailer deck, transport floor space, farm, replicate nested within farm, and all possible interactions. The model also included the random effects of loading day nested within replicate and farm, load nested within trailer design, replicate, and farm, and the load × trailer deck interaction. The experimental unit for the transport floor space treatments was the trailer compartment. The load × trailer deck interaction was used as the error term to test the effects of trailer deck, and the residual error was used to test the effect of transport floor space.

Relationships between transport conditions and losses were evaluated using Pearson correlations with the CORR procedure of SAS.

RESULTS AND DISCUSSION

Transport Times and Conditions

On average, times for loading, waiting at the farm, and total journey time were 45, 5, and 193 min, respectively (Table 2). Waiting times at the plant before unloading averaged 47 min but varied greatly by replicate (41.9, 9.2, 89.6, and 53.9 ± 5.8 min for the January, April, July, and October/November replicates, respectively). Throughout this study, pigs were loaded between 1900 and 0800, with majority of pigs being loaded between the hours of 0100 and 0800. It is likely that longer waiting times at the plant in July were due to more loads from other producers arriving at the plant during the same time as loads from this study. This would result in longer waiting periods before unloading. Unloading times averaged 21 min, including time to remove dead animals from the trailer. The average total time from the beginning of loading to the end of unloading was 310 min with a range from 230 to 546 min (Table 2).

As expected, average temperatures inside the trailer varied considerably across replicates (mean temperatures: 2.6, 10.9, 24.0, and 14.5 ± 1.02°C for the January, April, July, and October/November replicates, respectively). In general, temperatures inside the trailer increased when the trailer was not moving (i.e., during waiting at the farm, waiting at the plant, and unloading). Temperatures increased during loading and continued to increase and peaked during the wait at the farm (Table 2). Once the journey began, temperatures dropped by approximately 3°C. Upon arrival at plant, temperatures increased until the trailer was unloaded. Previous studies have also reported temperature inside the trailer increased during loading (Christensen and Barton-Gade, 1996; Chevillon, 2000; Hamilton et al., 2003) and when the trailer was not moving (Guise, 1991; Christensen and Barton-Gade, 1996; Hamilton et al., 2003) but decreased during transport (Chevillon, 2000).

Overall, average relative humidity in the trailer was 74.2% (Table 2). Relative humidity was lowest during loading (69.2%) and greatest after loading during the wait at the farm (81.3%). Relative humidity dropped to an average of 74.7% during the journey and remained relatively constant until pigs were unloaded.

Relationships Between Pig Responses at the Farm and the Plant

In the first replicate of this study, which was carried out in April, the incidence of nonambulatory pigs identified at the farm was very similar to the incidence of nonambulatory pigs identified at the plant (farm =

Table 3. Descriptive statistics for pig BW and transport losses[1]

Trait	Mean	SD	Minimum	Maximum
Avg pig BW of the load, kg	129.0	5.41	113.0	140.8
Nonambulatory at farm, %	0.26	0.57	0.00	3.03
Nonambulatory at plant, %	0.85	0.74	0.00	2.96
NAI,[2,3] %	0.24	0.36	0.00	1.18
NANI,[3,4] %	0.55	0.59	0.00	1.88
Transport deaths at plant, %	0.23	0.47	0.00	2.50
Total losses at plant,[5] %	1.08	0.94	0.00	4.38

[1]Data are for 12,511 pigs transported in 74 trailer loads.
[2]Nonambulatory, injured pig.
[3]Measured on 65 loads.
[4]Nonambulatory, noninjured pig.
[5]Total losses = nonambulatory pigs + transport deaths.

0.60% vs. plant = 0.73%). This suggested a possible relationship between the incidence of nonambulatory pigs at the farm and the incidence of nonambulatory pigs at the plant. Therefore, in the second replicate, which was carried out in July, pigs showing signs of stress during loading at the farm were marked and closely monitored on arrival at the plant. A total of 155 (6.61%) of the 2,346 pigs loaded were classified as exhibiting physical signs of stress (i.e., open-mouth breathing, skin discoloration, or both) after loading, and these were monitored at the plant. Three of these pigs were classified on the truck at the farm as nonambulatory, noninjured; 1 of these died on the truck, and 1 was nonambulatory, and the other was normal at the plant. Of the 152 pigs that showed physical signs of stress (i.e., open-mouth breathing, skin discoloration, or both) at the farm but remained ambulatory, only 1 was classified as nonambulatory, noninjured at the plant, and the remainder were considered normal. Overall 152 (98%) of the 155 pigs exhibiting signs of stress at the farm were considered normal at the plant.

Over the entire study, there were 32 (0.26%) nonambulatory pigs identified on the truck at the farm (Table 3), and 25 of these were followed from the farm to the plant, and 18 (72%) were normal at the plant, 3 (12%) were dead on arrival, and 4 (16%) were nonambulatory, noninjured at the plant.

It has been established that nonambulatory, noninjured pigs exhibit metabolic acidosis characterized by low blood pH, high blood lactate, and low blood bicarbonate (Ivers et al., 2002). However, recent research has demonstrated that blood acid-base measures of aggressively handled pigs return to prehandling baseline levels by 2 h posthandling (Bertol et al., 2002), and this suggests that these pigs can recover from handling stress if allowed to rest. Current National Pork Board recommendations suggest that pigs that become nonambulatory at the farm should be allowed to recover at the farm (NPB, 2004).

Collectively, our data from monitoring pigs exhibiting signs of stress and nonambulatory pigs at the farm through the plant suggest the majority of pigs recovered during the journey of approximately 3 h to the plant; however, a significant percentage of nonambulatory pigs (28%) did not. This has important implications for handling and recovery of nonambulatory, noninjured pigs. Additional research is necessary to more precisely establish the time necessary for nonambulatory, noninjured pigs to fully recover.

Average BW and Overall Transport Losses

The average live pig weight was recorded for each load and was 129 kg; however, this ranged from 113.0 to 140.8 kg for individual loads (Table 3).

The overall percentage of nonambulatory pigs at the plant was 0.85% (Table 3) for the 12,511 pigs transported. During the first 9 loads of the study, investigators observed that pigs became nonambulatory due to fatigue (nonambulatory, noninjured) or injury (nonambulatory, injured). Therefore, for the remaining 65 trailer loads of the study, nonambulatory pigs (0.79%) were classified as nonambulatory, injured (0.24%) or nonambulatory, noninjured (0.55%). The ratio of noninjured pigs to injured pigs was approximately 2:1 (Table 3). The number of transport deaths was 0.23%, which is similar to the national average for the United States (Ellis et al., 2003). The total losses in this study were 1.08%, and this is similar to results from a number of field studies (Ellis et al., 2003; 2004).

In this study, total number of animals lost during transport (dead and nonambulatory) was 135 on 74 loads. Interestingly, pattern of losses across loads was very sporadic as illustrated in Figure 1, where information on total losses by day of the study is presented. Furthermore, 60% of transport losses occurred on just 28% of loads (i.e., loads with 3 or more losses), whereas 51% of loads had 1 loss or less and accounted for only 17.8% of total losses (Table 4). Ellis et al. (2003) also reported a sporadic incidence of transport losses with 60% of transport losses being on just 20% of the loads. It is unclear why this variation in transport losses occurs; however, factors potentially associated with the incidence of losses on different loads of pigs on different days are environmental conditions, loading distances at the farm, people involved (handling crews and drivers), and waiting times at the plant.

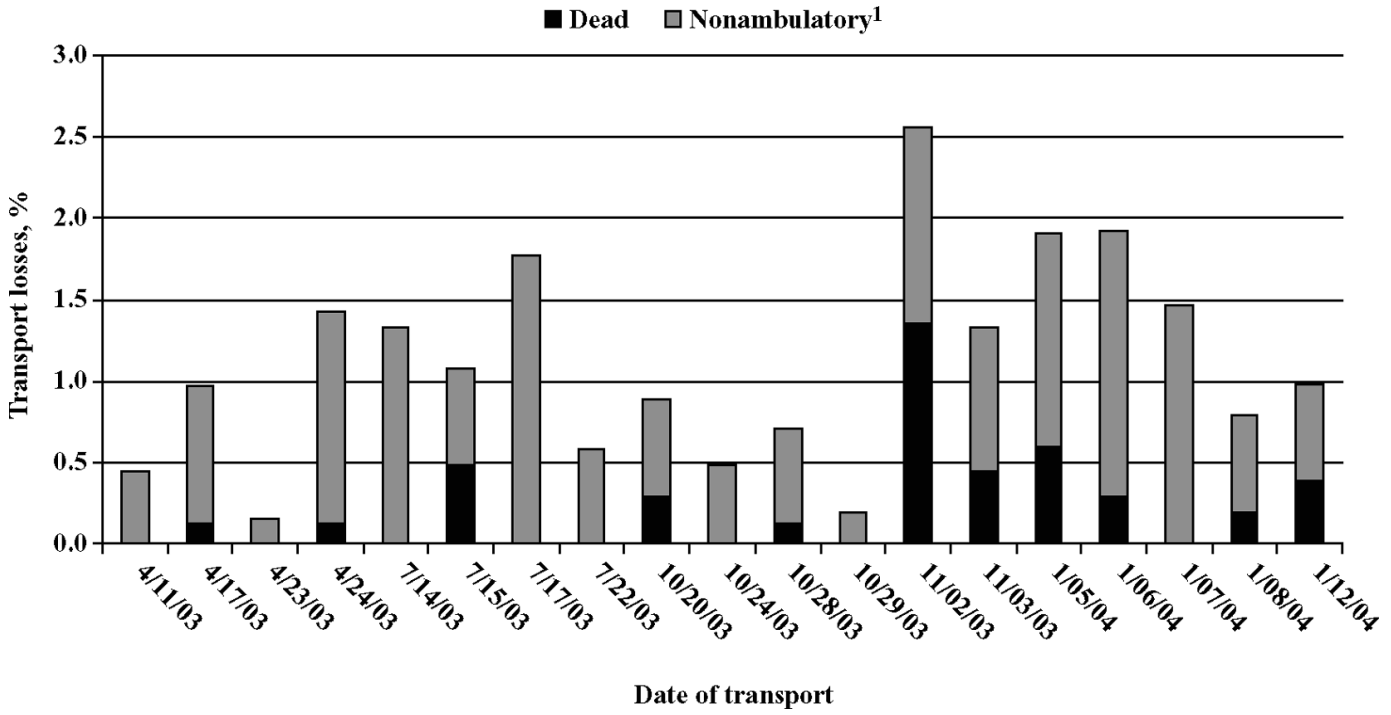

Figure 1. Transport losses by date of transport, based on 74 trailer loads and 12,511 pigs. [1]Nonambulatory = pigs were unable to stand, walk, or keep up with their contemporaries due to injury or fatigue.

Floor Space During Transport

In the current study, we examined effects of stocking pigs at 0.39 and 0.48 m^2/pig during transport on transport losses at the plant. Based on the average pig weights recorded for each load, these floor space treatments correspond to 0.30 and 0.37 m^2/100 kg, respectively. The current recommendations of the National Institute for Animal Agriculture (2004) approximate to 0.33 to 0.35 m^2/100 kg of BW. Weights were only available for the total load of pigs and not for individual compartments of animals. This latter data could only have been collected by weighing the pigs before loading, and this was not done to avoid any effect of previous handling of the pigs for weighing before loading on the animal response to the transportation process.

Increasing floor space during transport from 0.39 to 0.48 m^2/pig did not affect the incidence of nonambulatory, injured pigs at the plant but reduced the percentage of total losses at the plant (0.88 vs. 0.36 ± 0.16%, respectively; $P < 0.05$) with reductions in total nonambulatory pigs (0.62 vs. 0.27 ± 0.13%, respectively; $P < 0.05$) and nonambulatory, noninjured pigs (0.52 vs. 0.15 ± 0.11%, respectively; $P < 0.01$). Also, there was a tendency for pigs transported at 0.39 m^2/pig to have a greater percentage of dead pigs (0.27 vs. 0.08 ± 0.08%, respectively; $P = 0.06$; Table 5) than pigs transported at 0.48 m^2/pig. These findings agree with commercial

Table 4. Number of transport losses on each trailer load by replicate[1]

No. of losses per trailer load[2]	No.[3]	Replicate 1, April, No. of loads	Replicate 2, July, No. of loads	Replicate 3, October/November, No. of loads	Replicate 4, January, No. of loads
0	14	6	1	6	1
1	24	7	5	9	3
2	15	2	4	3	6
3	11	0	4	3	4
4	6	2	0	1	3
5	1	1	0	0	0
6	2	0	0	1	1
7	1	0	0	1	0
Total	74	18	14	24	18

[1]Based on 74 trailer loads and 12,511 pigs.
[2]Sum of transport deaths and nonambulatory pigs at the plant per load.
[3]No. of trailer loads.

Table 5. Effects of trailer deck and floor space allowance during transport on transport losses at the plant[1]

	Trailer deck				Floor space			
Plant losses	Bottom	Top	SEM	*P* value	0.39 m^2/pig[2]	0.48 m^2/pig[3]	SEM	*P* value
No. of observations	74	74	—	—	148	148	—	—
Nonambulatory, %	0.50	0.40	0.13	0.72	0.62	0.27	0.13	0.04
NAI,[4] %	0.06	0.15	0.06	0.32	0.09	0.12	0.06	0.98
NANI,[5] %	0.43	0.25	0.11	0.39	0.52	0.15	0.11	0.01
Transport deaths, %	0.25	0.10	0.08	0.20	0.27	0.08	0.08	0.06
Total losses,[6] %	0.75	0.49	0.16	0.36	0.88	0.36	0.16	0.02

[1]Least squares means.
[2]Based on 2,979 pigs.
[3]Based on 2,430 pigs.
[4]Nonambulatory, injured pig.
[5]Nonambulatory, noninjured pig.
[6]Total losses = nonambulatory pigs + transport deaths.

surveys that have suggested overcrowding pigs during transport is associated with increased mortality rates during transport (Robertson, 1987; Guardia et al., 1996; Riches et al., 1996).

Based on the results of the current study, providing pigs with 0.48 m^2/pig during transport was an effective means to reduce transport losses, and this has important implications for animal welfare. However, increasing floor space during transport also has economic implications. If the floor space treatments used in the current study were applied to an entire load, this would result in load sizes of 192 and 154 pigs at 0.39 and 0.48 m^2/pig, respectively. Additional research involving a greater number of floor space levels is required to determine the optimum space for pigs during transport for economic and welfare considerations.

Trailer Deck

The deck of the trailer onto which the pigs were loaded and transported had no effect on transport losses (Table 5). Climbing loading ramps has been shown to be a significant stressor to pigs (van Putten and Elshof, 1978), and therefore, greater losses for pigs transported on the top deck that have to climb an internal ramp on the truck might be expected. It would appear that in the current study, any extra stress associated with climbing the internal ramp did not result in an increase in transport losses for pigs on the top deck.

Relationships Between Transport Conditions and Transport Losses

As expected, causes of losses were correlated (Table 6). Nonambulatory pigs at the farm were positively correlated to total nonambulatory pigs (r = 0.35; $P < 0.01$) and total losses (r = 0.35; $P < 0.01$) at the plant. This is not unexpected given that, based on the monitoring of pigs from the farm to the plant in this study, a proportion (28%) of nonambulatory pigs at the farm did not recover during the journey. Percentages of dead and nonambulatory, noninjured pigs on arrival were positively correlated (r = 0.28; $P < 0.05$), suggesting there may be some common predisposing factors in these 2 conditions. The percentage of nonambulatory, injured pigs was not correlated to any of the other losses (Table 6).

A number of event times were unfavorably associated with plant losses (Table 7). Waiting time at farm, unloading time at the plant, and total time were positively correlated with plant nonambulatory, noninjured pigs (r = 0.24, 0.41, and 0.27, respectively; $P < 0.05$); total transport time (including stops), unloading time, and total time from loading to unloading were positively correlated with transport deaths (r = 0.29, 0.52, and 0.40; respectively; $P \leq 0.01$); and waiting time at the plant, unloading time, and total time were positively correlated with total plant losses (r = 0.24, 0.51, and 0.36; $P < 0.05$). Only unloading time at plant was correlated with total nonambulatory pigs at the plant (r = 0.32; $P = 0.01$), whereas event times were not correlated to nonambulatory pigs at the farm or nonambulatory, injured pigs at the plant. As mentioned above, unloading time was positively correlated to percentage of total nonambulatory pigs, nonambulatory, noninjured pigs, transport deaths, and total losses. However, these may not be direct relationships; unloading time included the time to unload dead and nonambulatory pigs from the trailer.

Temperature inside the trailer was not correlated to losses (Table 7). However, several authors have reported transport deaths are greatest in summer months and lowest in winter months (Allen et al., 1974; Smith and Allen, 1976). The relationship between ambient temperature and transport deaths has been described as hyperbolic or curvilinear (Smith and Allen, 1976; Warriss and Brown, 1994), where losses are very low when temperature is below 10°C but increase dramatically when temperature is above 15 to 18°C. In the current study, losses were greatest for the replicate in January (1.47%) compared with 1.06%, 1.01%, and 0.80% for the replicates carried out in July, October/November, and April, respectively. Hamilton (unpublished data) analyzed data relating to 2,199 loads from 1

Table 6. Correlations between transport losses[1]

Loss	Farm NA[2]	Plant NAI[3]	Plant NANI[4]	Plant Total NA[5]	Plant DOA[6]	Plant total losses[7]
Farm NA[2]	—					
Plant NAI[3]	0.13	—				
Plant NANI[4]	0.06	0.07	—			
Plant total NA[5]	0.35**	0.56***	0.86***	—		
Plant DOA[6]	0.16	–0.10	0.28*	0.16	—	
Plant total losses[7]	0.35**	0.37**	0.81***	0.87***	0.62***	—

[1]Pearson correlation coefficients, significant correlations are designated as *$P < 0.05$, **$P \leq 0.01$, and ***$P \leq 0.001$ (based on 74 trailer loads; 12,511 pigs).
[2]Nonambulatory pigs at the farm.
[3]Nonambulatory, injured pigs at the plant.
[4]Nonambulatory, noninjured pigs at the plant.
[5]Total nonambulatory pigs at the plant.
[6]Transport deaths at the plant.
[7]Total losses at the plant = nonambulatory pigs + transport deaths.

yr within the same production system and also reported that total losses were greatest in winter. Additional research is necessary to establish seasonal variation in transport losses and relationships between conditions during transport and transport losses.

The only relationship observed between relative humidity in the trailer and losses was between levels during loading and percentage of nonambulatory pigs at the farm (Table 7; r = 0.46; $P < 0.001$). However, this may not be a direct relationship because high relative humidity during loading was generally associated with rain, which led to slippery conditions on the loading ramps. Previous studies have reported no relationship between relative humidity and deaths during transport

Table 7. Correlations between transport conditions and losses[1]

Transport condition	Farm NA[2]	Plant NAI[3]	Plant NANI[4]	Plant total NA[5]	Plant DOA[6]	Plant total Loss[7]
Event time						
Loading	0.12	–0.04	0.17	0.15	0.09	0.16
Waiting at farm[8]	–0.10	–0.16	0.24*	0.08	0.15	0.14
Transport	–0.07	–0.15	0.04	–0.03	0.29**	0.12
Waiting at plant	–0.14	0.19	0.20	0.18	0.19	0.24*
Unloading	0.05	0.11	0.41***	0.32**	0.52***	0.51***
Total time[9]	–0.13	0.07	0.27*	0.20	0.40***	0.36**
Temperature in the trailer by event						
Loading	0.08	0.07	–0.23	–0.13	0.04	–0.08
Waiting at farm[8]	0.06	0.05	–0.16	–0.08	0.10	–0.01
Transport	0.08	0.05	–0.12	–0.04	0.09	0.01
Waiting at plant	0.05	0.19	–0.07	0.05	0.01	0.05
Unloading	0.06	0.20	–0.15	0.01	0.03	0.02
Average load temperature[9]	0.06	0.10	–0.13	–0.03	0.07	0.01
Relative humidity in the trailer by event						
Loading	0.46***	0.11	–0.16	0.08	–0.15	–0.01
Waiting at farm[8]	0.34**	0.21	–0.08	0.14	–0.14	0.03
Transport	0.41***	0.22	–0.20	0.10	–0.09	0.04
Waiting at plant	0.25*	0.12	–0.05	0.10	–0.05	0.06
Unloading	0.18	0.08	–0.08	0.06	0.03	0.07
Average load relative humidity[9]	0.44***	0.22	–0.13	0.15	–0.08	0.08
No. of loads within a day	0.25*	–0.04	–0.04	0.11	–0.07	0.05
Avg live wt of the load	–0.02	0.07	0.01	0.03	0.06	0.05

[1]Pearson correlation coefficients, significant correlations are designated as *$P \leq 0.05$, **$P \leq 0.01$, and ***$P \leq 0.001$ (based on 74 trailer loads; 12,511 pigs).
[2]Nonambulatory pigs at the farm.
[3]Nonambulatory, injured pigs at the plant.
[4]Nonambulatory, noninjured pigs at the plant.
[5]Total nonambulatory pigs at the plant.
[6]Transport deaths at the plant.
[7]Total losses at the plant = nonambulatory pigs + transport deaths.
[8]From the end of loading to the beginning of transport.
[9]From the beginning of loading to the end of unloading.

(Allen et al., 1974; Smith and Allen, 1976; Robertson, 1987).

Nonambulatory pigs at the farm were positively correlated with load number within the day ($r = 0.25$; $P < 0.05$; Table 7). This could be associated with increased fatigue of loading crew members at the farm, potentially resulting in aggressive handling of pigs.

Additionally, average BW of the load was not correlated to losses at the plant (Table 7). Trailers were loaded on the basis of floor area per pig and not per unit of BW. Consequently, as BW increased, pigs had less floor space when expressed on a weight per floor area basis. It should be noted that we recorded the average BW of the load and not of the weight of each compartment.

In summary, results of this study show that approximately 1% of all pigs transported were dead or nonambulatory at the plant and that the incidence was very sporadic among loads. Floor space on the trailer had a substantial effect on transport losses, and providing a greater level of floor space (0.48 compared with 0.39 m^2/pig) reduced transport losses and consequently improved welfare of pigs during transportation. In addition, transport times and conditions on the trailer may affect losses at the plant. Additional research is necessary to establish the minimum floor space on the trailer that results in the minimum transport losses.

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ATTACHMENT 11

THE WELFARE OF SLAUGHTER PIGS DURING TRANSPORT

P D Warriss

School of Veterinary Science, University of Bristol, Langford, Bristol BS40 5DU, UK

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The welfare of transported pigs can be compromised both by physical and psychological stresses. The animals' responses can be assessed using records of mortality and trauma, physiological and behavioural observations and, to some degree, by measurements of meat quality since this can reflect the animals' physiological state at death. These assessments may, therefore, be used as measures of animal welfare. During transport pigs show weight loss, increased circulating concentrations of catecholamines, cortisol and creatine phosphokinase (CPK), and an increase in heart rate and packed cell volume; sometimes there is evidence of dehydration. Increased levels of dark, firm, dry (DFD)meat after long transport reflect muscle glycogen depletion and possibly indicate some element of fatigue. There is experimental evidence that transport is aversive to pigs, which may be partially due to the fact that they become travel sick. Mortality in transport has ranged from < 0.1 to > 1.0 per cent in different European countries. Mortality is higher in more stress-susceptible breeds and at higher ambient temperatures. It is increased in pigs fed within 4h of transport, at higher stocking densities and after longer journeys at ambient temperatures greater than 10°C. Pigs may be fasted long enough before slaughter to prejudice their welfare through hunger. Long fasts may also reduce muscle glycogen levels and cause fatigue. Fighting between unfamiliar animals which have been mixed during the marketing procedure is also stressful, however, longer transport may actually reduce this problem by allowing animals to get used to one another under conditions in which it is difficult to fight.

Keywords: animal welfare, pigs, transport

Introduction

A large amount of research has been carried out on the effects of transport on pigs. Much early work was reviewed by Hails (1978). Our knowledge of the influence of transport on meat quality was subsequently summarized by Warriss (1987) and Tarrant (1989), and aspects of both welfare and quality by Lambooy and van Putten (1993). Recommendations and guidelines for handling pigs ante-mortem, including transport, have been given in Warriss (1994;1995a). Recently, interest has focused on the welfare of transported animals in general, partly because of the possibility of much longer journeys (especially in exported stock) with about 7 million pigs being exported every year within the European Union (Christensen *et al* 1994). Also, there is greater apparent awareness and concern by consumers about the ethical quality of the meat they eat (Warriss 1995b;1996a).

This review is an attempt to summarize the considerable body of information relating to the transport of slaughter pigs in the context of its implications for animal welfare. According to

Broom (1991), the welfare of an animal is 'its state as regards its attempts to cope with its environment'. Good welfare implies a state of well-being in regard to health and a lack of distress because the animal is coping easily.

The stresses of transport

The transport of pigs is an inherently stressful procedure. We can identify obvious physical stresses such as temperature extremes, vibration and changes in acceleration, noise, confinement and crowding. There are also psychological stresses like the breakdown of social groupings and mixing with unfamiliar animals, unfamiliar or noxious smells, novel environments, hunger and thirst, and fatigue. Welfare will be influenced by the combined magnitude of all these stresses and by the length of the journey. A short journey under poor conditions may compromise welfare as much as, or even more than, a long journey under good conditions.

Improving welfare centres on eliminating or ameliorating these stresses as far as possible. Often this has economic costs and therefore improvement may be restricted to the minimum commensurate with 'acceptable' welfare. The definition of 'acceptable' is problematic. An example is stocking density in transit: the more animals that are carried on a vehicle, the lower the unit cost. However, higher densities are associated with evidence of greater physical stress (Warriss *et al* in press) and higher mortality (Lendfers 1971) indicative of poor welfare. A compromise might therefore be suggested – that a particular mortality rate must be tolerated for the sake of economics. However, different parties will find higher or lower rates acceptable or not depending on their vested interests and their personal viewpoints.

Physiological responses of pigs to transport

The specific types of stresses associated with transport produce different kinds of response. Psychological stress promotes release of corticosteroids from the adrenal cortex. Many studies have documented increases in circulating cortisol in transported pigs (Dantzer 1982; Spencer *et al* 1984; Becker *et al* 1985; Nyberg *et al* 1988; McGlone *et al* 1993; Bradshaw *et al* 1996a) or corresponding decreases in adrenal ascorbic acid levels (Warriss *et al* 1983). Although pigs can become travel sick, there is debate as to the prevalence of travel sickness. Assessments by Riches *et al* (1996b) suggested a very low prevalence (1%) but may have been based on inadequate experimental methodology (Bradshaw and Hall 1996). Limited direct observations of pigs carried on rough journeys (Bradshaw & Hall 1996) indicated prevalences of around 20 per cent or more. It is unclear whether pigs find travel sickness as unpleasant as humans but they appear to respond similarly, showing elevated levels of the hormone vasopressin in their blood (Bradshaw *et al* 1996b).

McGlone *et al* (1993) found that in pigs transported for 4h, individual liveweight loss was negatively correlated with blood cortisol concentration. In other words, pigs which had a greater adrenal response to transport also lost more weight. Liveweight loss caused by transport per se is often hard to differentiate from the effects of food and water deprivation during the journey. However, Warriss *et al* (1983) found that pigs in a non-fasting state lost 0.6 per cent of their liveweight after 1h of transport and 2.3 per cent after 6h. Losses in liveweight may, at least in part, reflect loss of urine and faeces rather than of body tissue. Carcase yield (the weight of the saleable body parts, mainly consisting of muscle, fat and bone but excluding viscera) is a better indicator of losses of the substance of an animal's body. Carcase yield was significantly reduced by 2.1 per cent in the 6h group compared with yields from untransported control pigs. Some of

this reduction may have been caused by dehydration, as the transported animals subsequently drank more water in lairage and had higher plasma total protein concentrations in their blood at slaughter.

Lambooy *et al* (1985) found that transport for 44h led to a reduction in the water content of the subcutaneous fat on the back and suggested that the pigs were metabolizing the water to compensate for the reduced intake during transport. Transport also led to an increase in packed cell volume (PCV), and elevated concentrations of glycerol and ketone bodies in the blood. The specific gravity of the urine increased and blood glucose levels were reduced. The changes in backfat composition, PCV and urine composition support the view that the animals were becoming dehydrated during the journey. The changes in concentration of glycerol, ketone bodies and glucose indicate that the pigs were having to mobilize fats to supply metabolic needs. A summary of some of the physiological effects of transport in pigs is given in Table 1.

Table 1 A summary of some physiological effects of transport on pigs.

Effect	Reference
Live and carcase weight reduced	Warriss *et al* 1983
Blood cortisol levels increased	Dantzer 1982
	Spencer *et al* 1984
	Becker *et al* 1985
	Nyberg *et al* 1988
	Dalin *et al* 1993
Adrenal ascorbic acid depleted	Warriss *et al* 1983
Plasma adrenaline increased	Dalin *et al* 1993
Plasma CPK[1] increased	Honkavaara 1989; 1995
Changes in heart rate	Schütte *et al* 1996
	Christensen and Barton Gade 1996
Increased plasma total protein	Warriss *et al* 1983
Increased PCV and specific gravity of urine	Lambooy *et al* 1985
Decreased water in fat	Lambooy *et al* 1985
Increased number of circulating polymorphonuclear neutrophils and lymphocytes	Dalin *et al* 1993
Puberty induced in gilts with delayed puberty	Dalin *et al* 1998

[1] Creatine phosphokinase

In North America, pigs are often marketed for further fattening at about 9 weeks of age when they weigh 20–30 kg. The marketing procedure involves a period of up to 24h when animals are without food and water, mixing with animals from other rearing farms and transported for long distances (often 500–1000 km) to the fattening units. This results in quite significant weight losses (Table 2). These weight losses do not result in long-term detrimental effects to the pigs, based on their subsequent growth and performance to slaughter weights (Brumm & Peo 1985; Brumm *et al* 1987; Jesse *et al* 1988;1990).

Table 2 **Losses in liveweight in young fattening pigs (20–30 kg) during marketing in North America.**

Reference	Liveweight loss (%)
Brumm and Peo (1985)	8.4-12.7
Brumm et al *(1987)*	10.9
Jesse et al *(1988)*	6.8
Jesse et al *(1990)*	1.8-11.8

In addition to the transport itself, loading and unloading are often stressful episodes for pigs, particularly if handling facilities are inadequate. Loading ramps which are set too steep (at > 20° to the horizontal) are an example of such inadequacies (Warriss *et al* 1991). Van Putten and Elshof (1978) showed that heart rate increased to the greatest degree in pigs subjected to various procedures simulating commercial practice, when the animals were made to climb ramps. An increase in heart rate to very high levels at loading, which gradually fall during transport and then increase again at unloading, is often reported (Augustini & Fischer 1982; Christensen & Barton Gade 1996).

The effects of transport on meat quality have been investigated by numerous authors and reviewed by Warriss (1987). The results are very dependent on the stress-susceptibility of the pigs. The stress associated with even very short journeys can increase the incidence of pale, soft, exudative (PSE) meat in very stress-susceptible pigs, but more stress-resistant genotypes may show little or no effect of transport for moderate distances under good conditions. However, all pigs will show evidence of muscle glycogen depletion after longer journeys, particularly under poor conditions, and a higher incidence of DFD meat. In man, muscle glycogen depletion is associated with feelings of fatigue (Newsholme *et al* 1992) and it seems reasonable to think that pigs would respond similarly. Transport associated with increased levels of DFD might therefore reflect greater fatigue among the animals. For example, Malmfors (1982) reported that DFD incidence doubled in long transports (exceeding 90km) compared with short journeys (under 35km). Similarly, Heinze *et al* (1984) showed that as transport distance increased from less than 50km to more than 100km the frequency of carcases with higher than normal ultimate pH values increased from 23 per cent to over 30 per cent. The conditions under which the animals are carried will obviously be very important, but the implication is that long transport can fatigue pigs.

Mortality during transport

Even if an individual does not die, it is likely that its welfare will be reduced when overall mortality rates are high. Mortality during transport therefore reflects the welfare of all animals because it is usually determined, at least in part, by transport conditions. Death can occur either during the journey (DOAs – dead on arrivals) or subsequently in lairage (DIPs – dead in pens). The proportion of DIPs varies but averages range from 15 per cent (Warriss & Brown 1994) to 20 per cent (Allen 1979). It is normally assumed that pigs dying in lairage usually do so as a result of previous transport.

The effects of genotype and temperature

Two factors are particularly important in determining mortality rates in transported pigs. The first is genotype, the second is ambient temperature. The influence of genotype complicates the interpretation of the influence of other factors. So, a large part of the variation in actual mortality

rates seen in different European countries (which range from < 0.1% to > 1.0%) can be explained by differences in the inherent stress-susceptibility of the pig population in each. Breeds susceptible to stress, such as the Pietrain and Belgian Landrace, or genotypes containing genes from these breeds, are much more likely to die in transit (Lister *et al* 1981).

Stress-susceptibility is closely associated with presence of the 'halothane' gene (named for the test originally used to detect its presence, in which animals with a double recessive gene show extreme sensitivity to the anaesthetic gas). In the past this gene has been inadvertently selected for, in the quest for leaner, more muscular carcases. This is illustrated well by data given in Hails (1978) for various studies on the mortality of pigs during transport in the Federal Republic of Germany (Figure 1). There was a rapid rise in mortality between 1953 and 1974 accompanying strong selection for leaner carcases. Conversely, selection against the halothane gene in breeding stock reduces mortality among the slaughter population. This is illustrated in data from Sweden (Petersson & Gahne 1988). Between 1982 and 1987 the number of halothane-positive boars (sires) in the population was substantially reduced in both Landrace and Large White breeds. The mortality rate in transported pigs dropped correspondingly from 0.22 to 0.08 per cent.

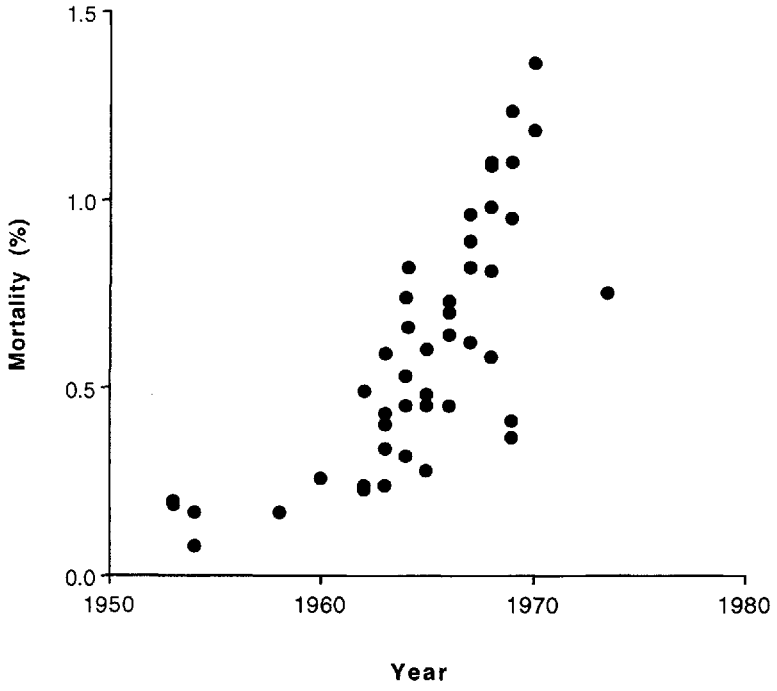

Figure 1 **Increase in the percentage of transport deaths between 1953 and 1974 in the Federal Republic of Germany. (Based on figures given in Hails (1978); the data came from 11 different studies.)**

There is a curvilinear relationship between mortality rate and ambient temperature (Allen & Smith 1974; Warriss & Brown 1994). In studies carried out in northern European countries, when the average daily temperature is below 10°C the incidence of mortality is low; at daily averages of between 10°C and 18°C it rises gradually, and above 18°C there is a very rapid

increase in the number of pigs dying. It is not clear whether this relationship holds in the southern, hotter parts of Europe. However, in Spain there is little evidence of seasonal variation in mortality attributable to ambient temperature (Guardia *et al* 1996) but this is because special precautions are taken in the hotter months. These take the form of not mixing unfamiliar pigs, showering during transport and undertaking journeys at night. Pigs reared under conditions of high ambient temperature may also become acclimatized to them. Based on a careful analysis of mortality data, Smith and Allen (1976) found that losses during the August to December period in the UK were slightly less than those in the January to July period at the same temperature. The pigs killed between August and December would probably have experienced slightly higher temperatures during rearing. Smith and Allen therefore suggested that to reduce mortality it could be desirable to keep pigs at as high a temperature as possible in the last days before transport to slaughter.

In northern Europe, the relationship between mortality and temperature leads to a well-defined, seasonal effect with more pigs dying during the summer months (Lendfers 1970; Allen & Smith 1974; Fabiansson *et al* 1979; Warriss & Brown 1994). Pigs are sensitive to high temperatures, probably because they are thought to be unable to sweat effectively and can lose heat only by increasing respiratory frequency – panting (Ingram 1964) – or by wallowing to achieve evaporative cooling. The latter is obviously not possible during transport. The combined effects of genotype and temperature probably explain the variation in transport mortality rates seen throughout Europe (Table 3). The effect of humidity is unclear. Smith and Allen (1976) could find no correlation between mortality and relative humidity of the outside atmosphere. However, the work of Abbott *et al* (1995), based on reports from vehicle drivers, indicated that most deaths occurred when the weather was described as hot and wet.

Table 3 **Pig genotype and transport mortality in some European countries. (Data from Warriss 1995a; information for Spain from Gispert *et al* 1996.)**

Country	Genotype	Percentage mortality
Denmark	SR	0.03
UK	SR	0.07
Italy	SR	0.10
The Netherlands	SR	0.16
Portugal	Mixed	0.16
Spain	Not known	0.22
Belgium	SS	0.30
Germany	SS	0.50

SR pig population mainly stress-resistant
SS pig population mainly stress-susceptible

The effect of time of last feed

The prandial state of the animal is also important to some degree in influencing mortality. Pigs should not be transported too soon after feeding since mortality is higher under these circumstances, partly, it has been suggested, because a full stomach can reduce the diameter of the vena cava, impairing venous return and leading to circulatory insufficiency (see Warriss 1994). Löhr (1970) reported that the weight of the stomach and its contents was very much higher in pigs which died in transport to livestock markets than in comparable animals which did not die in transport.

It has been recommended that the pigs' last feed should be arranged for between 4h and 12h before loading (Warriss 1994). However, some recent work now suggests that 4h may be too short a time to prevent pigs vomiting during transport (R H Bradshaw and D M Broom personal communication 1996), at least on vehicles showing poor vibrational characteristics. What the minimal interval should be is still unclear. In a study of 21 000 transported pigs Robertson (see p 453 of English *et al* 1988) found a much higher mortality rate (0.67%) in pigs loaded 2h–6h after their last feed than in those loaded after 6h–12h (where it was only 0.13%), or longer than 12h (where it was 0.17%). Sains (1980) found that mortality in pigs not fed on the day of transport was 0.06 per cent compared with 0.09 per cent in pigs fed on the day of loading. In a study reported in Gispert *et al* (1997) in which the effects of feed withdrawal for less than 12h, 12h–18h or greater than 18h on mortality was measured in five slaughter plants, the lowest overall mortality occurred in the 12-18h group. Less than 12h, as well as greater than 18h of food deprivation, both increased losses although there was some variation between plants.

Other factors affecting mortality

Marginally more pigs die on the bottom deck of transporters than on the top or middle decks in both winter and summer (Sains 1980; Riches *et al* 1996a). Most deaths occurred in the pen immediately behind the cab, possibly because of poorer ventilation of this part of the vehicle (Sains 1980). This fits in with the results from a previous Meat and Livestock Commission study conducted by Cambac JMA Research, in which it was found that pigs travelling in this pen had higher concentrations of cortisol in their blood at slaughter (42 ng ml^{-1}) than pigs travelling in the other pens (15–17 ng ml^{-1}) suggesting that they were more stressed (Meat and Livestock Commission 1993). A survey of 12 000 pigs transported in South Africa (Henning 1993) found that dividing vehicles by transverse partitions into smaller pens (as is standard in the UK) reduced mortality, as did having the vehicle exhaust at the back or side. Mortality rates were slightly higher in double- than in single-decked trucks.

Higher stocking densities are associated with higher mortality. Lendfers (1971) found that loading densities exceeding 1.2 pigs m^{-2} led to more deaths. Robertson (see p 453 of English *et al* 1988) found that mortality was highest (0.54%) in groups of pigs carried at the 'recommended' or higher stocking densities of vehicles, decreasing progressively as stocking density was reduced from 90–99 per cent of recommended level (with 0.34% mortality) to 80–89 per cent (with 0.17% mortality). Recent work from Spain (Gispert *et al* 1996) tends to support these results: in a comparison of pigs transported at densities of less than or greater than 0.4 m^2 pig^{-1} carried out in four slaughter plants, there was either no effect on mortality (in three plants) or a highly significant increase from 0.04 per cent to 0.77 per cent (in one plant). A recent survey of UK commercial practice (Riches *et al* 1996b) also found higher mortality in loads of transported pigs that were stocked above the average (239 kg m^{-2} [or 0.42 m^2 $100kg^{-1}$]).

There is also some evidence of greater mortality with longer transport. In journeys of between 99 miles (or less) and 300 miles(or more), mortality increased progressively from 0.21 per cent to 0.65 per cent (see Robertson, on p 453 of English *et al* 1988) but other workers have found no evidence of a distance effect (Smith & Allen 1976; Sains 1980; Riches *et al* 1996c). The different findings could be explained by the interaction between ambient temperature and distance identified by Lendfers (1971): at temperatures below 10°C, travel distances ranging from under 5km to over 45km had no effect on mortality; however, at temperatures of 10–15 °C, or above 15°C, deaths were more frequent on longer journeys.

Very long distance transport of pigs

The influence of very long journeys (≥ 24h) on pigs has been addressed by relatively few studies. Most work has been carried out by Lambooy and his colleagues in The Netherlands, probably reflecting the importance of the export trade of pigs from that country to southern European countries such as Italy. Pigs exported from The Netherlands to Italy may be in transit for 2–3 days, with conditions often varying from hot sunshine during the day to very cold nights (Lambooy 1988).

Effects on mortality and weight loss

Lambooy's studies have investigated variation in a number of factors including journey length, stocking density, ventilation and the potential value of providing water to the pigs during the journey. Both actual commercial journeys and experimental journeys have been examined. Two important measurements were of mortality rates and the loss in liveweight of the animals. Results for these, together with information from Markov (1981) quoted in Lambooy (1983), are summarized in Table 4. Two things are apparent. First, although the range of mortality values is large (0.0%–2.8%), mortality tended to be higher than normally found in short journeys (0.03% –0.22%, see Table 3) in European countries. Second, the loss in liveweight was also large (3.5% –8.0%) in journeys ranging from 25h to 44h, although not much larger than would be expected assuming that the loss was mainly accounted for by lack of food, and that the average rate of loss in liveweight under fasting conditions is 0.2 per cent of initial weight h^{-1} (Warriss 1985;1993).

Table 4 Summary of the effects of long distance transport of pigs on mortality and liveweight loss.

Reference	Journey time	Distance	Stocking density or rate	Mortality (%)	Liveweight loss (%)
Markov (19981)	60–72h	–	–	0.17	10.2
Lambooy (1983)	26–31h[1]	–	0.5m^2 pig^{-1}	0.087[6]	5.0–5.5
Lambooy *et al* (1985)	44h[2]	–	0.33-0.65m^2 100kg^{-1}	0[7]	8.0
Lambooy (1988)	28h–35h[3]	1500km	~0.36m^2 100kg^{-1}	0.34[8]	6.0-7.8
Lambooy (1988)	25h[4]	1300km	~0.47m^2 pig^{-1}	2.8[9]	4.0
Lambooy and Engel (1991)	25h[5]		0.39–0.59m^2 pig^{-1}	0.15[10]	3.5

– not known
1 six international journeys
2 one experimental journey
3 three international journeys
4 six experimental journeys
5 11 international journeys
6 One pig out of 1148 carried in six journeys from The Netherlands to Italy
7 no pigs died during the journey but two died before unloading for slaughter
8 two pigs in one journey out of three, in which a total of 597 pigs were carried
9 five pigs out of a total of 180 carried in three journeys
10 one pig in 11 journeys

A contributory factor to the high mortality in some of the experimental journeys was that, unlike the commercial situation, pigs were not selected for soundness before transport, with any unfit animals being removed. Nevertheless, the observed mortalities provide evidence that

welfare may well have been compromised in these long journeys. The liveweight losses imply that the pigs would have been hungry and possibly dehydrated. Direct evidence for the effects of fasting and water deprivation (leading to the mobilization of body energy reserves and dehydration) comes from increases in blood PCV and glycerol concentration, in the numbers of ketone bodies and in the density of the urine, in pigs transported for 44h (Lambooy *et al* 1985). In addition, this study found that transported pigs had a reduced water content of their subcutaneous fat, suggesting that they were mobilizing it to replace water lost from other parts of their bodies. The pigs also had higher ultimate pH values in their muscles, suggesting glycogen depletion and, possibly, fatigue.

Potential benefits of provision of drinking water in transit

In two studies (Lambooy 1983; Lambooy *et al* 1985) the potential benefits of providing water continuously during at least part of the journey by installing nipple drinkers in some pens was assessed. A surprising finding was that the pigs drank only very small volumes of water. In journeys of 26h–31h they consumed an average of only 0.65l per animal (Lambooy 1983) and on a journey of 44h, less than 5.4l – some of which was spilled rather than drunk (Lambooy *et al* 1985) – compared with a predicted normal water consumption of 7–20 l day^{-1}. These low consumptions were reflected in the findings that there was no effective influence of water provision on liveweight losses during the journeys in either study.

Lambooy (1983) suggested that possible reasons for the pigs not drinking included stress, fatigue, lack of food, vibration of the transporter, unfamiliarity with nipple drinkers and physiological adaptations to transport such as use of tissue water and reducing urine volume. It is conceivable that animals do not drink because they are suffering from travel sickness, but it seems unlikely that all pigs should have been affected in this way rather than a few individuals. Continuous provision of water did affect some meat quality measurements: in particular reducing some initial pH values and increasing rigor scores in the meat (Lambooy 1983) but overall, and rather surprisingly, there appeared to be few, if any, benefits of water provision.

Transport conditions and vehicle design

The welfare of pigs in transit is determined by the conditions under which they are carried as well as the length of the journey. Stocking density has already been considered in relation to mortality rates. The effects of different stocking densities on pigs, and the choice of appropriate densities, has recently been reviewed (Warriss 1998). Current legislation in the UK (*The Welfare of Animals [Transport] Order, 1997*) and EU Directive 95/29/EC, specify that under most normal circumstances pigs must have sufficient space to lie down during transport. Direct measurements and observations of pigs at different stocking densities suggest that this is equivalent to about $0.4m^2$ $100kg^{-1}$ for normal slaughter pigs weighing 90-100 kg. Slightly higher densities may be acceptable for very short journeys but space allowances of about $0.3m^2$ $100kg^{-1}$, which are sometimes seen in commercial transport, lead to physical stress. High densities in long journeys reduce meat quality in a manner which implies muscle glycogen depletion and, possibly, fatigue (Lambooy *et al* 1985).

Other important physical factors that may influence the acceptability of transport conditions are vibration and noise. Vibration is potentially an important source of stress during transport – although currently we have little information on the frequencies and magnitudes of vibration which are important. Randall *et al* (1995b) have made a comparative study of the vibration occurring in four different sorts of transporter. Vibration frequencies in the vertical direction ranged from about 1-4 Hz and in the lateral direction from about 2–16 Hz. Preliminary

observations (Perremans *et al* 1995) suggest that pigs respond to vibration in a similar way to humans. Based on analogy with human experience these authors concluded that the vehicles examined by Randall *et al* (1995b) would have provided rides ranging from 'very uncomfortable' (in a small, towed, twin-axle trailer capable of carrying about 10 pigs) to 'not uncomfortable to a little uncomfortable' (in a large, fixed-body transporter with air suspension). Of course, other factors of importance in determining pig comfort by influencing vibration will be the condition of the road surface, the speed of the vehicle, the qualities of the driver and the length of the journey, and possibly the insulating characteristics of the flooring and bedding.

There is good evidence that pigs find vibration aversive (Stephens *et al* 1985; Stephens & Perry 1990), based on the results of experiments using operant conditioning techniques; and that high intensity vibration is more aversive than low level vibration. It was also found that vibration was more aversive when pigs had eaten a large, rather than a small, meal immediately before testing, although there was some evidence that the hunger (presumably associated with a 24h fast) added to the aversiveness of vibration (Stephens & Perry 1990). The implications are that for their comfort, pigs should be fed (but fed just a small meal) before transport, and that the degree of aversiveness of vibration can be influenced by other factors. Rutter and Randall (1993) have used similar operant conditioning techniques to investigate the differences in aversiveness of different frequencies of vibration to broiler chickens but similar results are not yet available for pigs. The implications of vibration for animals have been discussed fully by Randall (1992) and his colleagues (Randall *et al* 1995a).

Humans can respond to vibration with feelings of motion sickness, discomfort or fatigue. Vibration also causes much of the noise in livestock transporters. Levels of 90dB on the A scale[1], or 115dB on the linear scale, have been recorded inside vehicles during the transport of lambs (Knowles *et al* 1993) and it is likely that similar noise levels are common in pig transporters. The effects of this noise on pigs are unclear. In the experiments described by Stephens and Perry (1990), noise alone at a level of about 80–90 dB was not aversive enough to cause the pigs to switch it off. However, there is some evidence that under particular conditions pigs may dislike noise and further research is needed in this area.

Consequences of food and water deprivation during transport

Transport is associated with the deprivation of food and water, which may be stressful, potentially leading to hunger, fatigue and dehydration. The deprivation may extend beyond the duration of the journey. It is recommended that pigs are not fed immediately before transport and a minimum interval of 4h between the last meal and loading has been suggested (Warriss 1994;1995a). As has been mentioned previously, this is partly because pigs with full guts show higher mortality in transport (Warriss 1994) and may also be more prone to suffering from travel sickness (Lambooy & van Putten 1993). However, in practice, short fasting times are uncommon and very long periods of food deprivation before slaughter may occur.

A survey of 370 pig producers in Northern Ireland (Moss 1986) showed that 22 per cent fed their animals a final meal on the morning of delivery to the slaughter plant, 54 per cent fed them the evening before delivery and 24 per cent fed them on the morning of the day before delivery. This equates with an overall average period without food of about 14h (Warriss & Bevis 1987) and agrees with the findings of a Meat and Livestock Commission survey for Great Britain

[1] Noise or sound levels can be measured on several scales. The linear scale measures sound level across the whole frequency range; the A scale weights the sound level so that it is equivalent to that which is audible to the human ear.

(Sains 1980). By combining this period of food deprivation before transport with that between leaving the farm and slaughter, given by Warriss and Bevis (1986), the total time without food can be estimated. This agrees well with direct estimates based on a survey of liver glycogen concentrations from pigs killed at four plants (Warriss & Bevis 1987). These authors estimated that 75 per cent of the pigs had been fasted for more than 8h, 50 per cent for more than 18h and 25 per cent for over 30h before slaughter – and suggested that a significant proportion of pigs were without food for long enough for this to be prejudicial to their welfare.

Lambooy and van Putten (1993) recommended that before long journeys (≥ 24h), feeding the pigs with a thin porridge made of one part of feed with a high sugar content and three parts water would reduce liveweight losses from the 5–6 per cent or more seen in non-fed animals to about 3 per cent. Presumably this would be correspondingly beneficial for pig welfare. Guise *et al* (1992) have suggested that gastric emptying may be delayed in some way by the process of drafting out and transporting pigs but it is unclear what, if any, consequences this might have.

Without food, pigs begin to lose liveweight very soon at a rate of about 0.2 per cent h^{-1} (Warriss 1985;1993). Part of this loss is urine and faeces, but carcase and liver weight reduction, reflecting loss of body substance, begins between around 9h and 18h, respectively, after the last meal. The carcase weight loss averages about 0.1 per cent h^{-1}. Associated with the liver weight loss is a reduction in liver glycogen content. This follows a logarithmic pattern (Warriss & Bevis 1987) so that very little remains after 24h, over two-thirds having been lost in the initial 12h. It is likely that pigs are feeling very hungry by this time. Muscle glycogen is also lost with longer fasting. Pigs with lower concentrations of glycogen in their livers, indicative of longer food withdrawal times before slaughter, tended to have less glycogen in their muscles and a higher ultimate pH (measured 24h after death) in their meat (Warriss *et al* 1989).

Water deprivation for prolonged periods is less likely to occur than food deprivation, as pigs generally have access to water until immediately before transport and subsequently in lairage. However, there is some evidence of dehydration occurring after only short journeys (Warriss *et al* 1983), although pigs seem reluctant to drink during transport even when water is offered (Lambooy 1983). It is therefore not clear whether pigs become particularly thirsty under these conditions.

Fighting between unfamiliar pigs during transport

Stable social hierarchies develop in groups of pigs reared together. These hierarchies are disrupted when unfamiliar animals are mixed together, as often happens during the marketing procedure in order to collect together uniform batches of pigs for slaughter. Individuals in the mixed groups frequently fight to establish new dominance orders. This leads to skin lacerations, particularly in the shoulder region, which can be severe. The animals also show elevated circulating concentrations of cortisol and creatine phosphokinase (CPK), and evidence of muscle glycogen depletion, indicating that fighting is a stressful experience (Warriss 1995a). About 40–50 per cent of slaughter pigs show some evidence of fighting, although the prevalence of animals with skin damage serious enough to lead to their carcases being commercially downgraded is much less – probably between 5–10 per cent (Warriss 1996b). Boars (entire males) tend to be more prone to fighting than females or castrates. Warriss (1984) found that boars were between 1.3 and 2.5 times as likely to produce carcases that were downgraded because of serious damage than non-boars.

Other factors which are thought to influence aggression and fighting include hunger, group size and the size range between mixed groups. When mixed groups of pigs are free to fight there is generally an increase in the severity of the consequences the longer the animals are in contact. So, longer lairage increases the amount of fighting damage to carcases, with animals held overnight in particular showing more damage (Warriss *et al* 1995). Interestingly, longer times in transport may not be associated with more fighting, probably because it is difficult to fight and maintain a footing in a confined space on a moving vehicle. In fact there is some evidence that longer transport times may reduce subsequent fighting by enabling individuals to get used to one another under circumstances which do not allow them to fight (Warriss 1996b). This would fit with the findings of Moss and Trimble (1988) who showed that mixing pigs for up to 1h in a restricted space (0.35 m^2 pig^{-1}) before transport, in comparison with mixing them in an open yard (> 25 m^2 pig^{-1}), significantly reduced skin damage.

It has been suggested (see Warriss 1995a) that providing pigs with more space during transport, especially allowing them 0.5 m^2 $100kg^{-1}$, could lead to more fighting for the same reason as above. Pigs transported at high stocking densities (> 0.39 m^2 $100kg^{-1}$) may have too little room for ease of movement to encourage fighting. There is, however, little or no evidence that low stocking densities promote fighting in practice.

Conclusions and animal welfare implications

Transport is an inherently stressful procedure and elicits characteristic physiological stress responses. The impact of the stress can be reduced by limiting the length of journeys and by ensuring transport conditions are as good as possible. These conditions (also) encompass marketing procedures associated with, but not directly relating to, the journey itself. They include adequate preparation of the animals for transport, controlled prior access to feed and water, minimal disruption to social groups and adequate loading facilities.

When examining the welfare of pigs in relation to transport it is important to consider all aspects of welfare and the significance of all changes to handling procedures associated with transport. For example, an ideal pre-transport fasting time is one which balances the requirement to avoid hunger both with that of preventing or ameliorating travel sickness, and with reducing transit deaths to a minimum. Breeding and selecting for more stress-resistant strains or genotypes of pig would improve welfare by reducing mortality and the metabolic consequences of transport stress. In general, improved conditions of transport and associated handling are likely to improve carcase quality and reduce mortality as well as improving other aspects of pig welfare. However, it is essential that prescribed conditions and handling procedures are universally and uniformly applied, and compliance with relevant legislation enforced.

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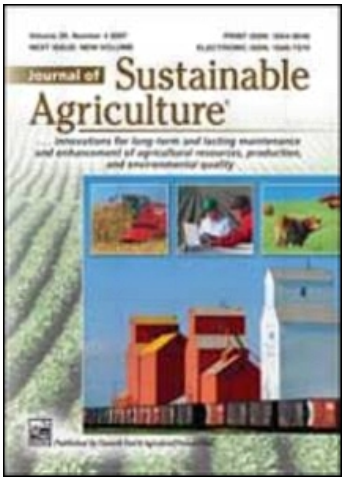
ATTACHMENT 12



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FDA: Prohibit the Slaughter of Downed Animals

Gene Barston

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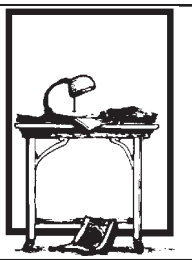
GUEST EDITORIAL



FDA:
Prohibit the Slaughter of Downed Animals

A sick cow, too weak to stand, is pulled off a truck by a tractor and chain, then falls four feet to the ground at a stockyard. A frail, day old calf is dragged through an auction ring by a back leg, while another calf, nearly comatose, is left in a corner to die. These are not isolated incidents. Across the United States, downed animals, animals too sick or weak even to stand, are being marketed and slaughtered for human food. They suffer horribly at stockyards and slaughterhouses, and their use in the human food chain poses a threat to human health.

It is practically impossible to handle and transport downed animals humanely. Even industry groups admit, ". . . it is near impossible to unload and/or move downed animals in a humane manner without first euthanizing them." Downed animals are commonly moved by the most convenient, though least humane methods. They are dragged with wenches and chains or pushed with tractors and forklifts, procedures which cause injuries ranging from bruises and abrasions to broken bones and torn ligaments. When former U.S.D.A. Secretary Edward Madigan saw videotape showing downed animals being moved by these methods, he said he was "disgusted and repelled." Incapable of getting to food or water troughs, downed animals endure hours or days without receiving these basic

needs. In addition, they are denied necessary veterinary attention, and many die of gross neglect.

Most downed animals are victims of the dairy industry–either worn out milk cows or fragile baby calves. Too often, dairy farmers ship dying animals to the stockyard in order to avoid the cost of disposing of dead animals on the farm. In response to nationwide news coverage criticizing industry's irresponsible mistreatment of downed animals, "Hoards Dairyman" wrote, "The black eye the livestock industry got over the widespread 'downer cow' publicity was self-inflicted. Frankly, we got what we deserved . . . Because of that unfortunate exposure, the image of livestock people has been tarnished, and consumers have yet another reason not to eat meat . . . There's no excuse for shipping animals which cannot walk." In addition to downed dairy cattle, incapacitated pigs, sheep, goats, and horses are also sold for slaughter. Responding to media pressure, "Pork Report" warned, "Producers should not 'push their problems' on trucks and hope to receive some salvage value for the animal or use the stockyards as a disposal system for this type of animal."

Marketing and slaughtering downed animals for food poses a serious threat to consumers. An article from "Meat and Poultry" magazine cited university research and reported, ". . . lame cattle usually have higher levels of bacteria on their carcasses. Lame animals spend more time lying down, which increases the likelihood they will be contaminated with fecal matter." Of course, downed animals spend all of their time on the ground. In addition to an increased risk of bacterial contamination, there is scientific evidence which indicates that some downed cattle in the United States may be afflicted with a variant of 'Mad Cow Disease' (BSE or Bovine Spongiform Encephalopathy). When the population of a Wisconsin mink ranch was decimated by an outbreak of transmissible mink encephalopathy, scientists hypothesized that the disease was caused by the mink's diet–a diet comprised primarily of downed dairy cows. After researching the incident, published findings "suggest[ed] the presence of an unrecognized BSE-like disease in the United States."

Attempting to address the downed animal problem and to allay public concerns, many stockyards and slaughterhouses have stopped accepting downed animals. This 'no downer' approach has caused farmers and livestock handlers to take steps to prevent downed animals in the first place. Commenting on this, a dairy veterinarian stated, "This winter the slaughterhouses in this area stopped accepting down cows . . . I have been very impressed with the response my [dairy] clients have shown since they have not been able to sell down cows. I have been called to attend more of the down cows to provide veterinary assistance and to humanely euthanize hopeless cases . . . In short, not selling cows as downers has not hurt my clients but has re-focused attention in the right direction–prevention and rehabilitation."

There is a growing consensus, even among industry representatives, that downed animals should not be marketed or slaughtered for human food as an article from "Beef Today," entitled 'Zero Tolerance for Downer Cows,' indicates. The article begins, "A downer cow in the sale barn aisle is not a pretty sight. For starters, it's a sure bet that everyone involved, including the cow, loses. To compound the problem, it is highly visible fuel for animal rights organizations." After providing examples of stockyards that have implemented 'no downer' policies, whereby they do not market downed animals, the article ends with a quote from a Colorado beef specialist, "A downer animal is a violation of our responsibility as stewards of livestock. We need to prevent these situations for a lot of reasons–the most important being, it's the right thing to do."

Unfortunately, while some within the livestock industry have acted responsibly, others continue to market downed animals, sometimes in violation of their own stated 'no downer' policies. The United States Department of Agriculture (USDA) surveyed stockyards across the U.S. and found the livestock industry's self-policing to be flawed. In documents obtained through the Freedom of Information Act, USDA reported, "Though many market representatives responded without hesitation that they would turn downers away from their doors, it became evident that some stockyards did not have a firm 'no downer' policy in place and would make exceptions . . ."

Also of concern, the U.S. Department of Agriculture and the U.S. Food and Drug Administration have failed to grant a petition filed by Farm Sanctuary to prohibit the slaughter of downed animals for human food. Citing federal laws, the petition argues that downed animals are 'diseased' by definition, and therefore asserts that these animals cannot be used for human food. Responding to this, the USDA shockingly asserted that the law did not prohibit diseased animals from being used for human food. (Letters are currently needed to urge that this petition be granted. Please see sidebar for details.)

Although thousands of downed animals are slaughtered across America every year, these animals represent a very small percentage of all livestock slaughtered. No farmer depends on the sale of downed animals for a livelihood. In addition, the vast majority of downed animals sent to stockyards and slaughterhouses could be prevented with basic management and handling improvements on the farm and in transportation. According to an article in "Meat & Poultry" magazine, "Ninety percent of all downers are preventable . . . the industry can eliminate downers by euthanizing them."

Although the livestock industry has been aware of downed animal suffering for decades, this problem has not been corrected through voluntary measures. Unscrupulous downed animals dealers and slaughterhouse operators are circumventing others' 'no downer,' exploiting a niche market, and undercutting voluntary efforts to resolve this problem through preventative measures. It is

increasingly clear that this problem will continue in the absence of government action.

Please write to the FDA and urge them to grant petition 98P-0151/CPI to prohibit the slaughter of downed animals for human food. U.S. Food and Drug Administration, Dockets Management Branch, 5630 Fishers Lane, Room 1061, Rockville, MD 20852; Fax: 301-827-6870 or E-mail: FDADockets@ oc.fda.gov

Gene Barston
c/o Farm Sanctuary
P.O. Box 150
Watkins Glen, NY 14891

PLEASE NOTE: It is critical that you refer to docket number 98P-0151/CP1 in your letter to FDA. Here are some points you may wish to include:

- Animals who are too sick or injured even to stand should not be allowed to enter the human food chain.
- In addition to posing an increased risk for bacterial contamination, there is evidence that some downed animals may be afflicted with a form of BSE (Bovine Spongiform Encephalopathy or "Mad Cow Disease"), a disease which has been linked to a fatal human illness (CJD or Creutzfeldt- Jakob Disease).
- It is impossible to move downed animals humanely, and they are typically pushed with tractors or dragged with chains–inhumane processes which cause injuries ranging from bruises and abrasions, to broken bones and torn ligaments.
- Downed animals comprise a very small percentage of animals slaughtered, and prohibiting their marketing will cause no undue economic hardship.
- Industry experts have estimated that 90% percent of downed animals can be prevented with better care and handling. Removing the market for downed animals will provide an incentive to industry to prevent downed animals in the first place.

For more information, please see: *www.nodowners.org* or contact Farm Sanctuary, P.O. Box 150, Watkins Glen, NY 14891; ph: 607-583-2225; fx: 607-583-2041; *www.farmsanctuary.org*

ATTACHMENT 13

RESEARCH REPORT
PORK SAFETY

Title: The effect of feed withdrawal on pork quality and the prevalence of Salmonella and gastric ulcers at slaughter – **NPB 97-2001**

Investigator: Morgan Morrow

Institution: North Carolina State University

Co-Investigators: Todd See
Joan Eisemann
Peter Davies
Kelly Zering

Abstract:

To help producers decide whether they should withdraw feed prior to slaughter, we designed a study that examined the effect of feed withdrawal on the proportion of gastrointestinal tract lacerations, prevalence of *Salmonella spp.* in cecal contents at slaughter, prevalence and severity of gastric ulcers, and meat quality as measured by ultimate pH, color, and water holding capacity. Finally, we analyzed the economic impact of the treatments. We assigned treatments to a finishing floor of 1133 National Pig Development barrows that were sent to slaughter in 3 groups. Each marketing group (feed withdrawn once, first group; twice, second group; or three times, third group) had an equal number of pigs that had feed withdrawn for 0 (control) 12, or 24 hours.

Withdrawing feed for 12 or 24 hours improved ultimate pH, Japanese color score, water holding capacity, and color as measured by Minolta L* but reduced carcass weight to 76.4 kg, and 74.5 kg respectively compared to no feed withdrawal (77.4 kg). Repeated feed withdrawal over the three week period reduced ultimate pH, water holding capacity, Minolta L* measure and Minolta b*. Pigs in the first group marketed (feed withdrawn once) had nearly twice the water holding capacity of the second and third marketing groups. These results suggest that on-farm withdrawal of feed for 24 hours prior to slaughter enhances ultimate pork quality. However, because pigs in the third marketing group have lighter carcasses and reduced carcass quality producers will receive less for the hogs if they are paid on a carcass-merit program. Yet, most of the discount may be unrelated to the feed withdrawal immediately prior to slaughter. It might be more associated with the poor performing pigs and decreased growth associated with the severe ulcers seen in pigs in the third marketing group.

Overall, prevalence of severe ulcers in this study was 13.7%. Damage from ulcers increased from the first of the three groups marketed to the third. Overall, prevalence of

chronic damage was 19.3% with 57.9% of chronic damage in stomachs from animals in the third marketing group (3 times treatment). Prevalence of esophageal constrictions was 10.4% with 66.7% of esophageal constrictions in stomachs from animals in the third marketing group (3 times treatment). Severity of damage, chronic damage, and esophageal constrictions all increased as carcass weight decreased, most notably for carcasses in the lowest weight quartile. These data show that withdrawal of feed prior to slaughter, for up to 24 hours, did not lead to an increase in stomach damage when compared to the appropriate control group. The relation of severity of damage, chronic damage, and esophageal constrictions to carcass weight suggests that the impact of chronic ulcers on growth of pigs may be greater than is widely appreciated.

Overall, 62% of cecal samples were positive for *Salmonella* but isolation was not associated with hours of feed withdrawal. The percentage of *Salmonella* positive ceca decreased from the first marketing group (73%) to the second (64%), and the third (52%). This indicates that feed withdrawal prior to slaughter did not increase the prevalence of Salmonella as reported in previous experimental studies and in this study the prevalence actually decreased over time.

Overall, 15.7% of gastrointestinal tracts were lacerated in one or more sections including the stomach (8.4%), colon (5.7%), small intestine (2.1%), and ceca (0.9%). The withdrawal of feed before slaughter decreased the weight of the gastrointestinal tract. Neither marketing group (feed withdrawn once, twice, or three times) nor the hours feed was withdrawn (0, 12, or 24) affected lacerations. Gastrointestinal tract lacerations were highest (14.4%) in the lightest quartile of carcass weight suggesting that the eviscerator was not able to adjust his work rhythm to account for the lighter, and presumably shorter carcasses. Most (94.1%) gastrointestinal tracts were lacerated in 1 section but 5.9% were lacerated in 2 sections. The proportion of lacerations in this study (15.5%) is higher than previously reported (4.5%). The difference may be due to the higher rate of evisceration (18 pigs per minute), or our more detailed examination of the gastrointestinal tracts.

Excluding meat quality differences, one time feed withdrawal had slightly positive but statistically insignificant effects on net returns from hogs in the first marketing group. Repeated feed withdrawal (twice and three times) reduced net returns from hogs in the second and third marketing groups. It appears that the animals that had feed withdrawn repeatedly had significantly lower carcass weights than controls in the same marketing groups. A question for further research is how much longer would the hogs that had feed withdrawn twice or three times have to remain on feed to attain the same carcass weight as the control hogs in their marketing group. It may be that negative effects of repeated feed withdrawal on net returns could be reduced by leaving the hogs on feed for several more days.

Introduction:

To compete in today's global markets the USA pork industry is rapidly changing from treating pork as a commodity product to one focused on quality. The outbreak of *E. coli* O157:H7 in 1993 increased government and industry focus on enhancing the safety of meat and lead to the adoption of HACCP principles to improve pork quality. Pork retailers have indicated that their top four quality concerns are: excessive color variation, too much purge, short shelf life, and lack of uniformity or consistency (NPPC,

Pork Chain Quality Audit). Unfortunately, a recent survey indicated that 26% of the pork evaluated at 14 major plants had unacceptable muscle quality (Kauffman 1992). Many of these quality problems are related to Porcine Stress Syndrome (PSS).

To decrease the proportion of PSE pork, producers are recommended (Eikelenboom 1991) to withdraw feed from hogs 12-24 hours prior to slaughter. Because producers are penalized for selling hogs outside a narrow weight range, most who have all-in/all-out facilities will send their hogs to slaughter over 3-4 weeks. In most cases, they withdraw feed from the last load but earlier loads are usually on full feed until they are shipped. The benefits of feed withdrawal are not without risks including a possible rise in the proportion of pigs with gastric ulcers or an increase in the proportion of pigs excreting *Salmonella spp.*

Salmonellosis currently costs the USA between $0.6 billion and $3.5 billion annually making it the most costly bacterial foodborne disease. From an estimated 696,000 to 3,840,000 cases, 690 to 3,800 people die each year in the United States (Buzby, AER, #741). Since 1970, there has been a steady increase in non-typhoid salmonellosis in humans caused by non-host adapted serotypes, particularly *S. typhimurium*, with the majority of outbreaks traced to foods of animal origin (Tauxe 1991)

Pork is a major cause of foodborne salmonellosis throughout the world. Studies of pork in retail stores found 15-22% of samples were contaminated. In Denmark in 1993, pork was the most important source of foodborne salmonellosis when meat contaminated with *S.infantis* accounted for an outbreak of 20 cases per 100,000 inhabitants. Although slaughter equipment is often the immediate source of contamination, the initial source is the carrier pig and transmission is thought to occur by pig-to-pig contact or from exposure to the contaminated environment. The handling and transport of pigs prior to slaughter has long been recognized as increasing the prevalence of *Salmonella spp.* To counteract these inherent risks researchers have been investigating techniques that may decrease the risk of contaminating carcasses. Withholding feed from pigs before slaughter decreases gastrointestinal contents and appears to decrease the risk of gastrointestinal spillage and consequent carcass contamination. However, feed withdrawal may be stressful and may increase the proportion of pigs excreting *Salmonella spp*.

In addition to the effects of feed withdrawal on carcass quality the possibility that it will also increase the proportion of pigs with gastric ulcers must be considered. The mechanisms by which gastric ulcers develop are not understood, however, if acid is a major factor and the pH of proximal stomach contents declines as time post-feeding progresses, then it is possible that feed withdrawal will initiate damage to healthy mucosa or accentuate damage where it exists already. The impact of feed withdrawal would likely be magnified if repeated several times. The result could be decreased growth rate due to severe lesions or death.

For the pork industry to remain competitive in domestic and international markets it must continue to focus on the needs of the customer. Withdrawing feed from hogs before they are slaughtered has the following potential benefits: decreased weight and contents of the gastrointestinal tract resulting in fewer lacerations and consequently decreased risk of carcass contamination, less feed wastage, increased yield, fewer carcasses with PSE, and decreased cost of manure treatment at the abattoir. The potential disadvantages include a possible reduction in live weight, possible reduction in

tenderness and juiciness (Ellis 1996), a possible increase in the proportion of pigs excreting *Salmonella spp.* and consequently an increased risk of carcass contamination, and the possibility of an increased prevalence of gastric ulcers. To effectively implement feed withdrawal as a standard production practice these benefits and disadvantages should be evaluated as a system.

Objectives:

To determine the effect of withdrawing feed from pigs at 0, 12, or 24 hours before they are shipped to slaughter and the effect of sorting by weight and withdrawing feed once, twice, or three times in a carcass-merit situation on:

- Proportion of gastrointestinal tract lacerations
- Prevalence of *Salmonella spp.* in cecal contents at slaughter
- Prevalence and severity of gastric ulcers
- Meat quality as measured by ultimate pH, color, and water holding capacity
- The economic impact of the treatments

Procedures:

Subjects: In March 1998, 1133 National Pig Development (NPD) barrows from a nursery site were weighed, individually identified and assigned, blocked by weight, to 36 pens. The barn had 40 pens and the other 4 pens were used to hold the cull pigs and the extreme lightest and heaviest pigs that were excluded from the study. Each pen of 29-32 pigs had pigs of similar minimum and maximum weight with similar variation between pens. Maximum variation within a pen, rather than minimum, allowed us to progressively select the heaviest third of pigs for slaughter from each pen and simulate the slaughter close-out of a barn of pigs where on about three occasions the heaviest third in the barn are taken to slaughter. By design, however, this procedure confounds the effects of repeated feed withdrawal with pig weight because the lighter weight (presumably slower growing) pigs are exclude from the first marketing group. Pigs were presumed homozygous stress negative because they came from lines that had been DNA tested and found negative for the HAL 1843 gene. In June, the 6 pens that had the fewest pigs (attrition from death and culling) were deleted from the study because they exceeded our needs.

Salmonella status: In February, 1998, we selected a nursery site that we had previously screened to ensure the pigs were Salmonella positive. After placement at the finishing site, we collected fecal samples on May 18-19, 1998 from about 2/3 individual pigs in all 36 pens and tested them for salmonella. On June 8-9, 1998 we collected fecal samples from the 30 pens remaining in the study.

Experimental design: A 3 by 3 factorial.

Treatments: Treatments included feed withdrawal of 0, 12, and 24 hours and marketing group (1, 2, and 3) selected on weight and having feed withdrawn once, twice, or three times prior to shipment. Treatments were allocated at random, blocked on pen prevalence of *Salmonella spp.* as determined from the fecal sampling in May and June. Feeders to the pens containing hogs for slaughter were shut off and any feed in the feeding troughs was returned to the pens' feeders.

Shipments: For the first and second marketing groups, the 10 heaviest pigs in each pen were visually identified and shipped (feed withdrawn once or twice). The third marketing group closed out the barn and consisted of all pigs remaining in all the test pens. In the second marketing group, an accident at the packing plant resulted in the loss of all data on all the pigs (60) for that day (Table 1). Pigs were individually tattooed with a unique 4 digit identifying number coded to describe the day and treatment. Time in transport and lairage were recorded by the person accompanying the pigs. In lairage, pigs had free access to water but not feed.

Table 1. Number of pigs shipped by day, marketing group, and treatments.

		Number of times feed withdrawn from the 12 and 24 hour pigs								
		Once			Twice			Three times		
		Feed withheld, hours			Feed withheld, hours			Feed withheld, hours		
		0	12	24	0	12	24	0	12	24
Marketing Group 1	June 22	20	20	20						
	June 23	20	20	20						
	June 24	20	20	20						
	June 25	20	20	20						
	June 26	20	20	20						
Marketing Group 2	June 29				20	20	20			
	June 30				20	20	20			
	July 1				20	20	20			
	July 2				20[a]	20[a]	20[a]			
	July 6				20	20	20			
Marketing Group 3	July 8							18	24	25
	July 9							19	19	21
	July 10							21	20	20
	July 13							22	23	18
	July 14							19	22	16
Total	907	100	100	100	100	100	100	99	108	100

[a]Data from all July 2 pigs were lost because of an industrial accident in the plant.

Gastrointestinal tracts (GIT): Standard evisceration procedure at the plant was as follows: the head was removed, the brisket cut open, the abdominal cavity opened, the anus (bung) dropped, then the gastrointestinal tract and thoracic cavity contents (pluck) were cut from the carcass and placed on a tray. On the tray, the esophagus was cut from the stomach and the pluck removed and placed on a hook for further processing.

Immediately the abdomens were opened we tagged the gastrointestinal tracts with temporary paper numbered tags which we could correlate to the carcass tattoos. The gastrointestinal tracts were then removed from the viscera trays, placed in plastic bags and taken off-line for us to examine. Tracts were trimmed to remove viscera and muscle and then weighed. Each tract was examined in detail, section by section, and noted which sections (stomach, small intestine, cecum, and colon) were lacerated. Then, the stomach was opened and rinsed. The pars esophageal region was scored from 1 (normal) to 7 (completely ulcerated) and evaluated for presence of chronic ulcers and constrictions of the esophagus.

Cecal samples: Each cecum was opened and 10 gm samples of cecal contents were collected and transported to the laboratory in Raleigh. To detect *Salmonella* organisms, all samples were treated by the standard techniques previously reported (Davies et al., JAVMA, 210:386-389).

Composition and Ultimate Muscle quality: Data on 657 pigs were collected on 11 days (no Saturday data). Hot carcass weight was collected and fat and muscle depth were determined by the Fat-O-Meter optical probe (SFK Technology, Denmark) at 30 minutes post stunning. One chop was collected from each carcass at the tenth rib location at 24 h. post-mortem and after a minimum 20 minute bloom time was evluated for color, water holding capacity, ultimate pH, and temperature (^{o}C). The loin was

measured in triplicate (medial, middle, lateral) and mean values calculated for color lightness (L*), redness (a*) and yellowness (b*) using a Minolta Chromameter 200 (set to D65 illuminant, a 2 degree standard observer, using an 8 mm optical port with glass insert, and calibrated with Minolta white standard color plate). A visual color score was also determined on a scale from 1 to 6 (1 = pale, 6 = very dark) using plastic Japanese color standards. On the same sample ultimate pH was measured using an Engold electrode and an Omega pH-50 meter. Water-holding capacity was evaluated by using filter paper (4.5 cm circles; S&S Filter Paper; Keene, NH) absorption of excess fluids on the cut surface as determined by weight increase (Kauffman et al. 1986).

Statistical Analyses: All data were analyzed in SAS. Categorical data were examined initially in the PROC FREQ and then GENMOD procedure. The following tests were adopted: where cell frequency was less than 5 for one or more cells, Fisher's Exact test; where data were ordinal, Mantel-Haenzel Chi-Squared; otherwise, Pearson's Chi-Squared. Continuous dependent variables were analyzed in PROC GLM using a variety of models.

For meat quality measures the statistical model included the fixed effects of feed withdrawal (0, 12, and 24), marketing group (1, 2, and 3), and withdrawal by market group interactions. The random cold temperature was fit as a covariate for ultimate pH, water holding capacity and Japanese color score. Contrasts among feed withdrawal treatments were also tested for linear and quadratic effects.

Economic analyses: Differences in revenues and costs were calculated for pigs in each of the 9 subgroups (0, 12, and 24 hour feed withdrawal combined with the three marketing groups that had feed withdrawal once, twice or three times prior to slaughter). Standard base values were assigned for price per pound of carcass weight ($0.60 per pound), feed cost per additional pound of gut weight ($0.025 per pound gut weight), non-feed cost of additional days on feed ($0.05 per day), and value of feed saved during feed withdrawal for animals that were returned to feed ($0.1312 per hog per 12 hour feed withdrawal and $0.2625 per hog per 24 hour feed withdrawal). Carcass merit value differences were calculated separately using the same carcass base price ($0.60 per pound) with the addition of a backfat adjustment (0.25% per mm. of backfat) and a muscle adjustment (0.20% per mm. of loin muscle depth). Carcass merit prices also included discounts of 30% for carcasses weighing less than 125 pounds, 20% for carcasses weighing 125 to 145 pounds, 3% for carcasses weighing 146 to 166 pounds, 2% for carcasses weighing 195 to 215, and 6% for carcasses weighing above 215 pounds. Values were calculated for each pig slaughtered and analyzed for effects of treatment and the marketing group.

Results:

Pigs were loaded and left the farm between 2-5am, traveled for 1hr 15 min (range: 1 hr 45 min to 48 min) and held in lairage for 3hr 50 min (range: 4 hr 47 min to 1 hr 58 min).

Meat Quality:

Tables 2 and 3 present least squares means for the effects of feed withdrawal and marketing group, respectively. Withdrawal of feed for 0, 12, and 24 h prior to slaughter resulted in linear reduction in hot carcass weight ($P < .01$) but did not have a significant effect ($P > .5$) on fat or muscle depth. Both linear and quadratic responses ($P < .01$) were observed for hot carcass weight over marketing groups that experienced repeated feed withdrawal. While a linear response ($P < .01$) was observed for fat and muscle depth indicating that later marketing groups were both leaner and heavier muscled. At slaughter carcasses were evaluated by collecting a loin chop from the 10th rib location. Withdrawal of feed for 0, 12, and 24 h prior to slaughter resulted in linear improvements in ultimate pH, Japanese color score, water holding capacity, and color lightness as measured by Minolta L*. However, repeated feed withdrawal and graded marketing over the three week period resulted in linear ($P < .01$) and quadratic ($P < .01$) reductions in muscle quality as measured by ultimate pH, water holding capacity, Minolta L* measure and Minolta b* measure. No significant effect ($P > .05$) for feed withdrawal or marketing group was observed for color redness as determined by Minolta a*.

Table 2. Effect of feed withdrawal on carcass composition and ultimate muscle quality.

Measure	Feed withdrawal (h) 0	12	24	Pooled standard error
Hot carcass weight (kg)[a]	77.4	76.4	74.5	.5
Fat depth (mm)	21.0	21.3	20.8	.3
Loin depth (mm)	47.1	47.2	46.6	.4
Ultimate pH [b]	5.63	5.65	5.66	.01
Water holding capacity (mg) [c]	894.6	915.8	819.2	30.3
Minolta L* [b]	53.1	52.9	52.3	.1
Minolta a*	5.44	5.44	5.21	.09
Minolta b*	4.74	4.72	4.68	.09
Japanese color score [c]	2.99	3.17	3.14	.06

[a] Linear effect of feed withdrawal, $P < .01$
[b] Linear effect of feed withdrawal, $P < .05$
[c] Linear effect of feed withdrawal, $P < .1$

Table 3. Effect of marketing group on carcass composition and ultimate muscle quality.

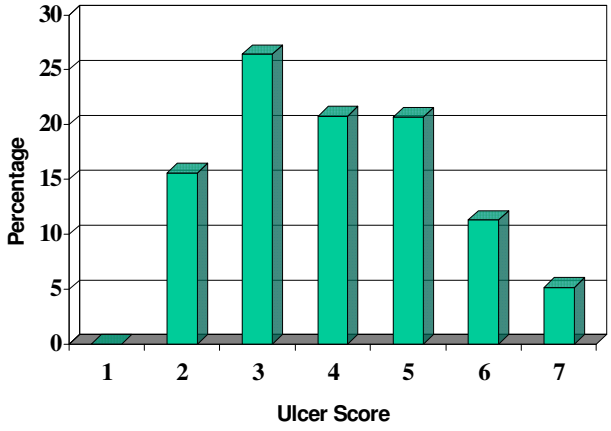
Measure	Marketing group 1	2	3	Pooled standard error
Hot carcass weight (kg) [a,b]	77.4	79.0	71.9	.5
Fat depth (mm) [a]	21.8	21.7	19.6	.3
Loin depth (mm) [a]	46.0	46.3	48.7	.4
Ultimate pH [a,b]	5.71	5.61	5.62	.01
Water holding capacity (mg) [a,b]	604.2	1085.9	939.5	32.9
Minolta L* [a,b]	50.5	54.3	53.5	.3
Minolta a*	5.18	5.44	5.47	.10
Minolta b* [a,b]	4.33	5.01	4.80	.10
Japanese color score	3.07	3.12	3.12	.06

[a] Linear effect of feed withdrawal, $P < .01$
[b] Quadratic effect of feed withdrawal, $P < .01$

Gastric Ulcers:

A total of 752 stomachs were evaluated for damage. The esophageal region of the stomach was scored, and signs of chronic damage to stomach tissue and constriction of the esophagus were noted. The scoring system ranged from 1 (normal, healthy tissue) to 7 (ulcerated completely). No stomach was given a score of 1. Almost every stomach evaluated showed bile staining. The percentage of pigs with each ulcer score across all treatments is shown in Figure 1. Scores of 3-4 reflect tissue that was roughened, often with elongated projections and breaks in the tissue. Scores of 5 and above indicate presence of increasingly severe ulcerations.

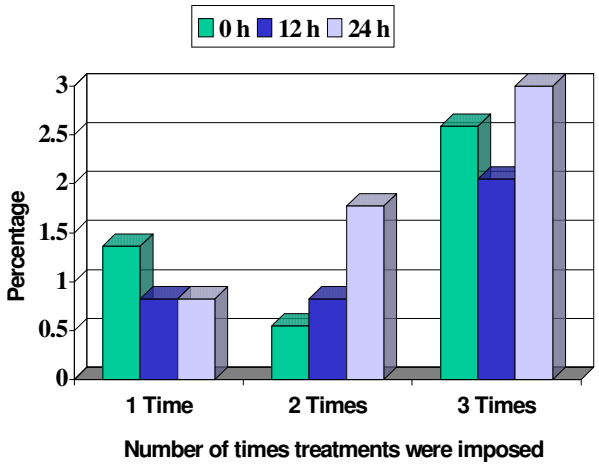
Figure 1. Percentage of pigs with each ulcer score (across treatments).



The average ulcer scores differed ($P < .005$) for 0, 12 and 24 h withdrawal and were 3.8, 3.6 and 4.1, respectively; however, there was no difference between stomachs from pigs on 0 vs 12 and 24 h withdrawal. The average scores for marketing groups differed also ($P < .001$) and were 3.6, 3.8 and 4.1, respectively, showing that damage increased in the pigs that were marketed later and as the number of times treatments were imposed increased. Ulcer scores were grouped as mild (1-3.5), moderate (4-5.5)

and severe (6-7). Overall, prevalence of severe ulcers in this population was 13.7%. The percentage of pigs with severe ulcers in each treatment is shown in Figure 2.

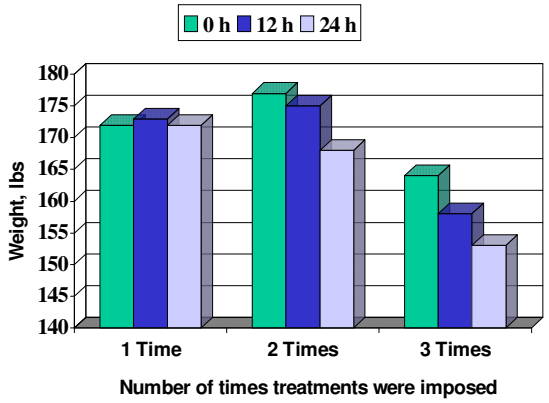
Figure 2. Percentage of pigs with severe damage for 0, 12, or 24 h feed withdrawal.



Overall, prevalence of chronic damage was 19.3% with 57.9% of chronic damage in stomachs from animals in the third marketing group (3 times treatment). Overall, prevalence of esophageal constrictions was 10.4% with 66.7% of esophageal constrictions in stomachs from animals in the third marketing group (3 times treatment). Prevalence of chronic damage and esophageal constrictions were not affected by the length of feed withdrawal.

Because stomach damage was highest in pigs in the third marketing group (3 times treatment) with no relation to time of feed withdrawal, carcass weight was considered as a variable that might explain the greater prevalence of damage in the 3 times treatments. There was an interaction ($P < .01$) between the effect of length of feed withdrawal and marketing group for carcass weight such that carcasses were lighter as length of feed withdrawal increased and they were also lighter as the number of times that feed was withdrawn increased. The lightest carcasses were from the pigs that had feed withdrawn for 24 hours and were in the third marketing group (Figure 3).

Figure 3. Carcass weight of pigs for 0, 12, or 24 h feed withdrawal



Carcass weight was separated into quartiles to examine the relationship between carcass weight and severity of damage, chronic damage, and esophageal constrictions. Severity of damage (Figure 4; P <.01), chronic damage (P <.05), and esophageal constrictions (Figure 5; P <.001) all increased as carcass weight decreased, most notably for the lowest quartile.

Figure 4. Percentage of pigs with mild, moderate, or severe damage in each carcass weight class.

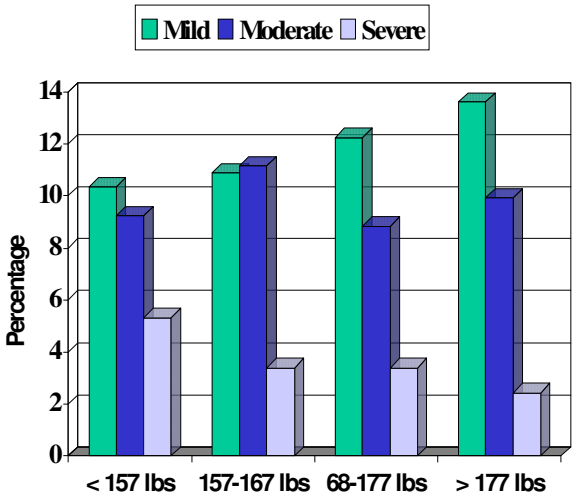
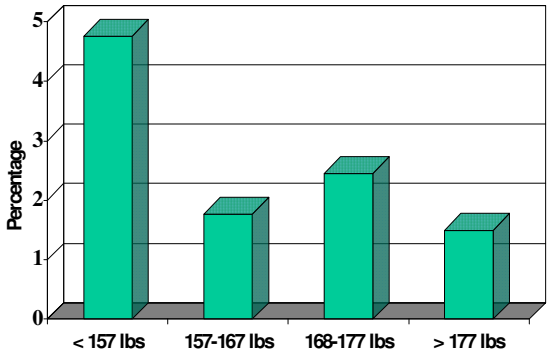


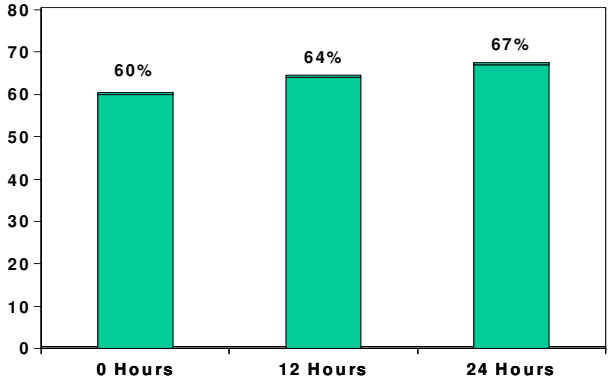
Figure 5. Percentage of pigs with esophageal constriction in each carcass weight class.



Salmonella:

Overall, 62% of cecal samples were positive for Salmonella. Isolation of Salmonella was not associated (P =0.1) with hours of feed withdrawal (Figure 6) but was highly related (P =0.0001) to the marketing group (number of times feed was withdrawn)(Table 4).

Figure 6. Percentage of cecal samples positive for *Salmonella* by hours of feed withdrawal.



The percentage of positive salmonella cecal samples decreased (P = 0.001) from the first to the last marketing groups 73%, 64%, and 52% respectively (Table 4).

There were no differences in the percentage of positive salmonella cecal samples between pigs who had their feed withdrawn once (73%) and their controls (72%); feed withdrawn twice (68%) and their controls (56%) or feed withdrawn three times (53%) and their controls (49%)(Table 4). Control pigs were in the same marketing group but did not have feed withdrawn.

Table 4. Percentage of positive Salmonella cecal samples by marketing group.

	Feed withdrawn		
	12 and 24 hours	0 hours, controls	Overall
First marketing group	73%	72%	73%
Second marketing group	68%	56%	64%
Third marketing group	53%	49%	52%

The prevalence of Salmonella in fecal samples in May was much greater than prevalence in June (Table 5).

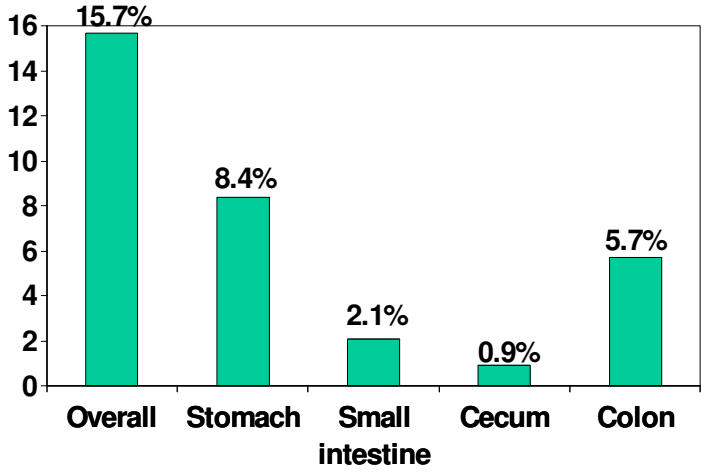
Table 5. The pen prevalence of Salmonella in fecal samples in May and June 1998.

	Pen prevalence of Salmonella											
	0%	4.8%	5.8%	9.5%	14.3%	19%	23.8%	28.6%	38.1%	42.9%	57.1%	66.7%
May, 1998	1	6	1	2	5	2	6	3	1	1	1	1
June, 1998	17	6	0	4	0	1	1	1				

Lacerations:

Overall, 15.7% of the 773 gastrointestinal tracts examined were lacerated in one or more sections (Table 6).

Table 6. Percentage of lacerations overall and by section.



Withdrawal of feed before slaughter decreased the weight of the gastrointestinal tract. The weights of the gastrointestinal tracts of pigs with no feed withdrawal (7.7kg $\pm$1.04) were greater (P = 0.0001) than the pigs with 12 hr feed withdrawal (6.6kg $\pm$0.87) and they were greater (P = 0.06) than the pigs with 24 hr feed withdrawal (6.3kg $\pm$0.91). The proportion of gastrointestinal tract lacerations ranged by day from 8.3% to 23.9%, but the differences were not significant (P = 0.32)

Overall, the feed withdrawal treatments, or marketing group, had no effect on lacerations. However, 11.4% of stomachs were lacerated on 0 hr feed withdrawal compared with 6.9% for the 12 and 24 hour feed withdrawal (P = .03). The likelihood of laceration of the gastrointestinal tracts (excluding lacerations to the stomach because they may have been cut by plant staff removing the esophagus) was highest (14.4%) in the lightest quartile (table 7) of carcass weight and there was a tendency (though not statistically significant) for more lacerations (16%) in the heaviest gastrointestinal tracts (greater than 9 kg)(table l9).

Table 7. Prevalence of lacerations by carcass weight.

	Carcass weight, kg			
	81 or more	80-76.5	76-71	70 or less
Sample size, n	178	170	191	174
Percent with lacerations	5.1%	7.6%	5.8%	**14.4%**

Table l9. Prevalence of Lacerations by Gastrointestinal tract weight.

	Gastrointestinal tract weight, kg					
	≤5	>5 to ≤6	>6 to ≤7	>7 to ≤ 8	>8 to ≤ 9	>9
Sample size, n	20	124	260	188	75	25
Percent with lacerations	10.0%	8.9%	8.1%	6.9%	9.3%	**16%**

There was a tendency for lacerations of the small intestine to be associated (P = 0.14) with carcass weight, 4.8% of small intestine in the lightest quartile were lacerated compared with 1.24% of the others. Lacerations to the cecum were not associated with either treatment or carcass weight. Lacerations to the colon were not associated with carcass weight but there was a tendency (P = 0.09) for more lacerations in 0 h feed withdrawal, 7.2%, compared with 12 h and 24 h, 5%. Most (94.1%) gastrointestinal tracts were lacerated in 1 section but 5.9% were lacerated in 2 sections.

Economics:

Excluding carcass merit or meat quality effects, the hogs that had feed withdrawn only once or were in the corresponding control group (the first marketing group) demonstrated no significant effect of feed withdrawal on the selected revenues and costs. Net revenue differences for the 12 hour feed withdrawal and 24 hour withdrawal were +$0.99 (P = .52) per hog and +$0.19 (P = .90), respectively versus no feed withdrawal. The hogs in the second marketing group (feed withdrawn twice) and their corresponding control group demonstrated a statistically insignificant effect from those withdrawn from feed for 12 hours (-$0.96, P =.54) and significant effect from those off feed for 24 hours (-$5.51, P = .0004) versus the control group. The hogs in the third marketing group (feed withdrawn three times) also demonstrated a statistically significant effect from both those withdrawn from feed for 12 hours (-$3.71, P =.0047) or 24 hours (-$6.29, P =.0001) versus the control group. Effects of feed withdrawal on carcass price through backfat and loin muscle premiums and carcass weight discounts were not statistically significant (12 hour feed withdrawal: +$0.14 per cwt. (P = .80); 24 hours: -$0.34 per cwt. (P =.54) versus the control group) for the first marketing group. Hogs in the second marketing group (feed withdrawn twice) also did not demonstrate

significantly different carcass merit adjustments to carcass price (12 hours: -$0.07 per cwt. (P =.92); 24 hours: -$1.12 per cwt. (P =.0863) versus the control group). The hogs in the third marketing group (feed withdrawn 3 times) demonstrated statistically mixed effects on carcass merit adjustments to carcass price (12 hours: -$0.86 per cwt. (P =.1331); 24 hours: -$2.20 per cwt. (P =.0002) versus the control group).

Discussion:

Meat Quality:

These results suggest that on-farm withdrawal of feed for 24 h prior to slaughter enhances ultimate pork quality. However, in a carcass-merit situation ultimate muscle quality was reduced over time. This reduction may be caused by any one, or the combination, of smaller, slower growing pigs that may have had increased health challenges, increased incidence of gastric ulcers, and repeated withdrawal of feed over time.

Gastric Ulcers:

These data show that withdrawal of feed prior to slaughter, for up to 24 hours, did not lead to an increase in stomach damage when compared to the appropriate control group. The relation of severity of damage, chronic damage, and esophageal constrictions to carcass weight suggests that the impact of chronic ulcers on growth of pigs may be greater than is widely appreciated. However, the causes of chronic stomach damage in this population of pigs is not known.

Lacerations:

The proportion of lacerations in this study (15.5%) was higher than previously reported (4-5%) (Miller et al, 1997). The difference may be due in our study to the high processing speed for evisceration (18 pigs per minute) and/or a more detailed examination of the gastrointestinal tracts in this study which may have decreased under-reporting. As expected, the weight of the gastrointestinal tracts decreased with increasing duration of feed withdrawal. However, unexpectedly, the increase in lacerations was not associated with the heavier gastrointestinal tracts but with the lightest carcass weights. It may be that, in this plant, the rhythm of the evisceration process was disrupted by the lighter and presumably smaller carcasses resulting in an increase in lacerations.

If the reduced weight of the gastrointestinal tract is due to reduced feed content in the gastrointestinal tracts of pigs withheld from feed, and not an increase in water content for the control pigs, then the slaughter enterprise could have substantial benefit by having a reduced amount of feed waste to process.

From the perspective of bacterial contamination, an important finding is the low prevalence of cecal lacerations and lack of association of cecal lacerations to treatment or carcass weight.

This is important because most contamination occurs after singing (Gerats, 1990) and the ceca is the second highest site for recovery of Salmonella (71%) after the palatine tonsils (93.5%) (Wood et al, 1989). In addition, the cecum usually has a very fluid content which could readily spill and potentially grossly contaminate of the carcass. The association of lacerations to particular sections of the gastrointestinal tract may arise because of the effect of feed withdrawal (stomach and colon) and carcass weight (small intestine), on the rhythm of the evisceration process.

Salmonella:

Our results indicate that feed withdrawal 12 or 24 hours prior to loading does not increase the percentage of cecal samples positive for Salmonella post-slaughter.

These findings support the hypothesis that the prevalence of Salmonella in pens of pigs in finishing barns is a poor predictor of prevalence of Salmonella at slaughter. Transport (Williams and Newell, 1970) and lairage (Morgan et al., 1987) along with close contact with other pigs are likely more important determinants of Salmonella prevalence at slaughter.

The pattern of *Salmonella* isolations over time in the finishing barn indicate that many pigs that were excreting *Salmonella* in May had stopped by June. This trend is in accordance with Oosterom and others, 1981, who reported that when pigs become infected with *Salmonella* they gradually stop excreting over 9 weeks. If this trend of decreased excretion continued from June until when all pigs were slaughtered, it could explain the decrease in percentage of *Salmonella* positive cecal samples from the first group slaughtered (73%) to the last group (52%). Our results concur with findings from experimental *Salmonella* infections of pigs which indicate that fecal shedding declines over time.

A limitation of our study is that we may have overestimating the true prevalence among treatments of cecal Salmonella at slaughter because pigs of all feed withdrawal treatments (0, 12, and 24 hour) were daily transported to slaughter on the same truck and shared the same lairage.
The increased stocking density combined with the stress involved may have led to cross-infection with *Salmonella* among the treatments. During transport and lairage an initial *Salmonella* infection of the tonsils may reach the colon and rectum in 2 hours (Edel et al., 1974; Oosterom et al., 1981) which is less than the 5 hours our pigs were in transport and lairage.

Economics:

A consistent economic result emerged from the analysis. Feed withdrawal had no statistically significant effects on net revenue from the hogs that had feed withdrawn only once excluding meat quality benefits. However, marketing groups did show statistically significant reductions in net income for animals that had feed withdrawn. The effect was most significant for the 24 hour withdrawal in the second and third marketing group. Reduced carcass weight in pigs that had feed withdrawn twice or three times as compared to their control groups appears to be a primary factor in net revenue effects. This "within marketing group" reduction in net revenue was in addition to the lower revenue earned by the third marketing group consisting of "tail-enders". While it is difficult to attach a dollar value to meat quality attributes, the economic results are consistent with the meat quality results: feed withdrawal may be a net benefit as long as feed is not withdrawn more than once.

Research questions this study raises:

Meat Quality:

Our results indicate that 24 hour feed withdrawal improves meat quality but quality was progressively reduced from the first marketing group. These findings need to be

tested in other finishing sites to determine if our results can be generalized across farms. A remarkable finding for meat quality from this study is that those animals sent to slaughter in the first marketing group have twice the water holding capacity of the later groups. This needs to be tested in other finishing sites and the biological reasons investigated.

Gastric Ulcers:

We found a high prevalence of severe ulcers that probably were established before we started the feed withdrawal treatment. We suspect that these ulcers were primarily responsible for the lighter carcass weight in the third marketing group. If so, then gastric ulcers are contributing to a major decrease in growth efficiency and meat quality. This hypothesis needs to be investigated at other finishing sites and the underlying cause further explored.

Salmonella:

The decrease in Salmonalla isolates with later marketing groups in our study suggests that the tendency for pigs to decrease shedding of Salmonella over time is more important than the stress of successive feed withdrawal. This hypothesis needs to be investigated at other finishing sites and the underlying cause further explored.

Lacerations:

Our study indicates a much higher prevalence of gastrointestinal lacerations than previously reported. This finding need to be investigated at other finishing sites servicing other packing plants and the underlying and contributing factors, such as carcass weight, further explored.

Economics:

A question for further research is how much longer would the hogs that had feed withdrawn twice or three times have to remain on feed to attain the same carcass weight as the control hogs in their marketing group. It may be that negative effects of repeated feed withdrawal on net returns could be reduced by leaving the hogs on feed for several more days. If one or more of the carcass characteristics (weight, meat quality, salmonella prevalence, etc.) is affected by repeated feed withdrawal and/or by marketing group, then economic analysis is required to compare alternative sorting strategies in combination with alternative feed withdrawal strategies for each marketing group.

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ATTACHMENT 14

An unusual outbreak of Streptococcus suis type 2.

Author(s): Chennells, D.

Source: Pig Journal **Volume:** 36 **Page(s):** 203-207 **Published:** 1996

Abstract: A high health grow-out unit of about 1200 animals for gilt production suffered an outbreak of S. suis type 2 infection shortly after a similar infection in the source breeding unit. Early clinical signs were acute lameness caused by a severe septic arthritis and not the usual signs of clinical meningitis.

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CABICODES: LL820 Parasites, Vectors, Pathogens and Biogenic Diseases of Animals (Discontinued March 2000); LL880 Animal Treatment and Diagnosis (Non Drug) (Discontinued March 2000)

Descriptors: lameness; sows; arthritis; bacterial diseases

Geographic Location: UK

Organism Descriptors: Streptococcus suis; pigs

Broad Descriptors: Streptococcus; Streptococcaceae; Firmicutes; bacteria; prokaryotes; Sus scrofa; Sus; Suidae; Suiformes; Artiodactyla; mammals; vertebrates; Chordata; animals; ungulates; British Isles; Western Europe; Europe; Developed Countries; Commonwealth of Nations; European Union Countries; OECD Countries

References: 2 ref.

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ATTACHMENT 15

Farm Bill Testimony

Washington, September 20, 2006 -

Testimony of

National Pork Producers Council

for the

United States House Committee on Agriculture

September 20, 2006

Washington, D.C.

INTRODUCTION

The National Pork Producers Council is an association representing 44 state pork producer organizations. NPPC is the voice in Washington for the nation's pork producers, who in 2005 marketed 55 million hogs with total gross receipts of $15 billion. The U.S. pork industry supports more than 550,000 jobs in the United States; these include input suppliers, producers, processors, handlers and main-street businesses. Overall, an estimated $20.7 billion of personal income and $34.5 billion of gross national product are generated by the hog industry based on 2005 levels of production.

PROFILE OF TODAY'S PORK INDUSTRY

The United States pork industry represents a significant value-added activity in the agriculture economy and the overall U.S. economy. The $15 billion of gross receipts from hogs marketed in 2005 represents only a portion of the economic activity generated by the pork industry.

The hog industry in the United States has seen rapid structural changes in recent years, yet total hog numbers have trended up from a decade ago. In 1990, inventories were 54.5 million head; data from December 2005 showed inventories over 60 million head.

The growth of the United States inventory is feeding growing consumer demand. Of processed hog products, 3.6 billion pounds were exported and 24.2 billion pounds were used in domestic markets. Domestic consumption of pork in 2005 was 680 million pounds higher than it was in 1990; exports were 2.4 billion pounds higher than they were in 1990. In 2005, the U.S. pork industry enjoyed its 14th consecutive year of record exports.

Pork producers are deeply committed to local community economic health, growth and development. We proudly call these communities our homes. There are nearly 35,000 direct, full-time pork-producing jobs, including farm workers and farm proprietors. An additional 76,000 harvester and processing jobs and 439,500 jobs throughout the rest of the economic chain are supported by the pork industry.

The U.S. pork industry today provides nearly 28 billion pounds of safe, wholesome and nutritious meat protein to consumers worldwide each year. In fact, 2006 will be the fifth consecutive year of record pork production in the United States, and all indicators point to another record in 2007. This is accomplished by nearly 67,000 pork operations in all 50 states, with most production located in the upper Midwest, mid-Atlantic and High Plains states.

2007 FARM BILL

The National Pork Producers Council has established a 2007 Farm Bill Policy Task Force, which has held several meetings, reviewing and evaluating many of the Farm Bill issues that will affect our industry. Pork producers have been actively engaged in the Farm Bill process, participating in several congressional field hearings. We are committed to working with this Committee as a new Farm Bill is crafted.

As the next Farm Bill is written, we hope Congress will consider the needs of the nation's pork producers: 1) maintain the U.S. pork industry's competitive advantage globally; 2) strengthen the industry's competitiveness; 3) defend the industry's competitiveness by opposing unwarranted and costly provisions and regulations.

Pork producers would like to share their thoughts on a number of issues that likely will be part of the debate when Congress considers the next Farm Bill.

Renewable Energy

America's pork producers strongly support the development and use of renewable fuels to reduce the nation's dependence on foreign oil. But the rapidly growing demand for renewable fuels, specifically ethanol from corn, presents a challenge for pork producers. New ethanol plants scattered throughout the country are coming on-line quickly and many more are in the construction and planning stages. Currently there are sufficient corn supplies to meet the demand for feed, fuel, food and exports for the next two crop years. Beginning in 2008, though, ethanol production could be large enough to cause displacement in the domestic pork industry. Given current and projected ethanol prices, ethanol plants likely will be able to outbid pork producers for corn. Additionally, any wide-spread drought would significantly accelerate this problem.

The U.S. pork industry is probably more exposed to the growth of the ethanol industry than any other livestock sector. Be wary of claims that the largest by-product of ethanol production, dried distillers grains (DDGs), can make up any deficiencies in feed from corn. Pigs cannot utilize DDGs as effectively as other livestock species. Dr. Jerry Shurson at the University of Minnesota has reported that high-quality DDGs are worth about $114 per ton to dairy producers, $108 to beef producers, $104 to egg layer operations, $100 to poultry finishers and only $96 to swine grower finishers. DDGs are low in starch and amino acids and high in oil and fiber. Some contain mycotoxins that can be harmful to animal health. Some ethanol plants overheat the DDGs, making them even less useful, and there are vast differences in the quality of DDGs from plants. Additionally, DDGs cause storage flowability problems and are high in phosphorous and protein, resulting in excess phosphorus and nitrogen in manure, which can

lead to environmental problems. Furthermore, nutritionists have noted that when DDGs in excess of 10 percent of total feed are given to hogs, a reduction in fat quality can be found, resulting in a less superior product. Therefore, the substitution of DDGs into the nation's feed supply will put the pork industry at a competitive disadvantage.

Further research and development are needed to find other energy alternatives, such as using animal manure and fat and biomass, including lignocellulose, switchgrass and corn stover. NPPC has established a Renewable Fuels working group to evaluate this issue further. The right balance is needed to meet the needs of fuel *and* feed security. The U.S. pork industry needs your support to make sure pork producers remain competitive in this changing world.

Conservation Reserve Program

Pork producers believe the marketplace should decide how to meet the demand for renewable energy, which could mean crop-producing acres currently in the Conservation Reserve Program (CRP) be placed back into production between now and 2010. Without these additional acres being made available for crop production, producers are facing run-ups in feed prices in years to come. Pork producers remain committed to leaving in the CRP, even among its current corn acres, those portions of fields that are planted to filter strips, buffer strips, grass waterways and other partial field enrollments that provide extremely high environmental benefits. Pork producers also support returning CRP land to crop production in a manner that preserves CRP-developed organic matter and minimizes erosion through the use of practices such as conservation and no-till techniques. But the bottom line, in our view, is that much more crop land must be made available to ensure there is an adequate feed supply to meet demand.

Animal Identification

In today's marketplace, adopting new technologies is absolutely imperative for the swine industry to remain dynamic, progressive and aware of market demand. Bio-security remains a cornerstone in our production facilities so that absolute confidence in the safety and wholesomeness of pork can be maintained by domestic and international consumers. U.S. pork producers believe in the establishment of a mandatory National Animal Identification System and are committed to an industry-wide approach in identifying our animals. We believe animal ID enables state and federal animal health officials to address existing diseases, foreign animal diseases and emerging diseases. An ID system will allow for monitoring and establishing efforts to control and eradicate these diseases, and a surveillance system will facilitate tracking and containing the spread of disease. Pork producers believe that the ability to rapidly identify animals and detect, contain and eliminate disease is an essential food security tool that will preserve the domestic and international marketability of U.S. livestock.

Trade

Pork producers are the most ardent promoters of free trade agreements, which have prompted rapid growth in pork exports and record profitability. We realize that as an industry we must continue to work to remove distortions that impinge on the free market. There is a considerable global demand for pork and pork products. Pork represents 44 percent of global meat protein intake, far more than beef and poultry. World pork trade has grown from 3.9 percent to 5.3 percent of total world pork consumption in just the past five years. The extent of any increase in global pork trade in the future will hinge heavily on continued efforts to bring about further agricultural trade liberalization. We support the Market Access Program (MAP) and the Foreign Market Development Program (FMD), which help expand export opportunities for U.S. pork, and we urge continued funding for these programs, which have long-term market benefits. It is important to emphasize the need to strengthen the ability of U.S. agriculture to compete in the global marketplace. American agriculture is among the most competitive industries in the world, but it should not be expected to compete alone in the export markets against foreign governments. Reductions of MAP and FMD funding would put American farmers at a substantial competitive disadvantage. Regardless of the timing in writing a new Farm Bill, Congress should extend Trade Promotion Authority. TPA is very important to U.S. agriculture and the U.S. livestock sector – it sends to our trading partners the message that the U.S. is a willing and open trading partner. We need to strengthen the ability of U.S. agriculture to compete efficiently in the global and domestic marketplaces.

Risk Management

U.S. pork exports in 2006 are estimated to be 15 percent of production, up from 12 percent in 2005. The U.S. pork industry will enjoy its 15th straight record year for pork exports in 2006. Our success in expanding exports has created a new market environment. The downside of growing exports is a larger adverse economic impact should there be any trade disruption. Pork producers understand this dynamic, and Congress must recognize that a trade disruption would be devastating to the U.S pork sector. Iowa State economist Dermot Hayes estimates a $3.6 billion loss for the industry if export markets are lost.

Given that potential significant shock to the U.S. pork industry – and to the U.S. economy – NPPC supports programs to minimize the economic impact of any trade disruptions. We understand that a USDA Livestock Risk Protection program and an Iowa program were placed in the 2002 Farm Bill. Pork producers are evaluating these futures market-based programs and the reasons for their limited success among producers. NPPC is looking at federal revenue-based assurance options that would assist producers should export markets ever be interrupted.

Research

USDA's research is critical to the pork industry, be it improving swine genetics by completing the mapping of the swine genome; testing and deploying new and improved animal vaccines; improving the usefulness of energy production by-products, such as distillers dried grains; further increasing animal productivity; or the development of new environmental management and mitigation technologies such as the means to reduce or mitigate potentially regulated air emissions from swine facilities. Research can assist in monitoring diseases and preventing a disease outbreak.

A significant amount of research has been devoted to other animal genomes. It is time for USDA to do the same for the swine genome. Genome sequencing is only the first step to unlocking key genetic information. Annotation is the identification of the functional genes associated within the sequence of the genome and will provide the industry with tools to quickly and efficiently improve production efficiencies in nutrition, swine health, reproductive physiology, animal welfare, nutrient management and pork quality. In addition, the pig is an excellent model for human research in health and nutritional disciplines. Annotation of the swine genome will assist in the development of research models in human nutrition, physiology and medicine.

We also support establishment within USDA of the National Institute of Food and Agriculture, which would conduct research and studies to "ensure that the agricultural innovation that has been so successful in the past continues in the future."

Conservation and the Environment

Pork producers have reduced the environmental footprint of their operations on the country's natural resources and landscape through the adoption of sound and advanced manure management and utilization practices. The vast majority of the resources pork producers have invested in these practices were provided by producers themselves, without public assistance. But pork producers were and remain very interested in participating in USDA's working-lands conservation programs, such as the Environmental Quality Incentive Program (EQIP), to raise the level of their environmental performance and to address any remaining critical conservation and environmental needs on their operations. During debate on the 2002 Farm Bill, U.S. pork producers took a lead role with other livestock groups to advance major funding increases for EQIP. So we are quite disappointed in how little support EQIP has provided to pork producers over the 2003 to 2005 program years.

After a thorough review of several hog-producing states' EQIP programs, NPPC presented its findings to the Natural Resources Conservation Service. Despite what we believe to have been sincere efforts by NRCS to correct the program's problems, EQIP continues to fail pork producers. Using NRCS data and our own estimates, we calculated that approximately $1.98 billion in cost-share assistance was provided by the EQIP program to both crop and livestock producers from 2003 through 2005. Of this amount, approximately $1.26 billion or 63 percent of the total was provided to livestock producers. This percentage is consistent with the 2002 Farm Bill recommendation that 60 percent of funds go to livestock and poultry. Looking at the 2003 data, pork producers received just 3 percent of the cost-share assistance provided to all livestock producers that year – less than goats, emus, ostriches, elk and bison received. After reviewing the data from 2004 and 2005, we found the same results.

Figure 1: EQIP spending under the 2002 Farm Bill on all livestock, 2003 to 2005

and total over that period, by species

Species	2003-2005 $	'03-'05%	2005 $	'05%	2004 $	'04 %	2003 $	'03%
Horses	$7,147,193	1%	$0	0%	$4,421,244	1%	$2,725,949	1%
Sheep	$16,858,540	1%	$8,883,826	2%	$4,522,929	1%	$3,451,785	1%
Swine	$43,061,095	3%	$17,582,432	4%	$14,569,213	3%	$10,909,450	3%
Other	$46,002,475	4%	$18,867,510	4%	$15,459,060	3%	$11,675,905	4%
Poultry	$73,275,499	6%	$32,524,429	7%	$25,645,002	6%	$15,106,068	5%
Dairy	$248,745,439	20%	$91,143,643	18%	$88,806,934	20%	$68,794,862	22%
Beef	$825,055,530	65%	$327,827,898	66%	$296,134,316	66%	$201,093,316	64%
Total	$1,260,145,771		$496,829,738		$449,558,698		$313,757,335	

Even in the eight states (Iowa, North Carolina, Minnesota, Indiana, Illinois, Missouri, Nebraska, and Oklahoma) that account for 78 percent of the nation's pork output, producers received only 11 percent of the EQIP cost-share assistance funds provided to all livestock producers from 2003 through 2005. While an improvement, it still indicates a significant under-investment in the environmental practices of pork producers. NPPC would like this imbalance corrected and would like EQIP funds to be allocated for specific on-farm practices that have a clear environmental benefit, such as development of comprehensive nutrient management plans and the use of technical service providers; odor and emissions reduction practices; and manure storage, transfer and field application technologies.

Animal Care, Housing and Transportation

America's pork producers established the world-class Pork Quality Assurance (PQA) program to provide responsible animal care through the application of scientifically sound practices. That means proper care and handling at each stage of the production process, with no tolerance for mistreatment of animals, and it means well-kept facilities to allow for the safe and humane movement of each animal and development of herd health programs with veterinary advice. Further, we enhanced our

commitment to animal care through the Pork Quality Assurance Plus program. This is a first-of-its-kind animal welfare program in the U.S. livestock sector that combines producer education and on-farm assessments, verified by third-party audits, to ensure the highest levels of animal care. Furthermore, we have a Trucker Quality Assurance (TQA) program that addresses animal care and handling issues during transport. For producers, there is no higher priority than maintaining the well-being of their animals, and they have shown their commitment by funding PQA and TQA through their check-off dollars.

While the pork industry has invested hundreds of thousands of dollars in research and practical applications to enhance swine well-being, our industry is under attack by those who would severely restrict the raising of livestock and poultry for food. We are faced with provocative ad campaigns used to sway public opinion, lawsuits that seek to halt our production practices and scare tactics that question the safety of our product. In the next Farm Bill, we expect so-called animal-rights groups to push to add a number of provisions that, if adopted, would be very detrimental to the well-being and viability of U.S. pork producers, including:

Extension of an 1870s law, known as the "28-hour rule," to the transportation of all livestock to all destinations. The law was enacted to deal with the movement to slaughterhouses of cattle by train. A lawsuit is pending to force USDA to bring all livestock transported by truck under the "28-hour rule." The pork industry already has adopted a Trucker Quality Assurance program that addresses animal care and handling issues during transport.

A ban on all non-ambulatory livestock from the food supply. Several animal-rights groups tried in the last three Congresses – including an effort during the 2002 Farm Bill – to include such a ban. For pork producers, this would be particularly devastating given that previous versions of federal legislation called for the euthanasia at auction markets and slaughterhouses of any animal which, for whatever reason, does not get up and move under its own power at delivery. The physiological makeup of the pig often prompts it to lie down. Under the strict conditions of previous legislation to ban such non-ambulatory animals, these pigs would be killed without regard to their health, the ownership of the animals or the cost to the producer. There is no food-safety risk associated with harvesting pigs that lie down for some period of time.

A ban on the use of certain animal health products and the adoption of free-range housing, including a ban on stalls for all species. This effort could come in the form of H.R. 5557, a bill that would place severe restrictions on modern pork production for producers who want to sell to the federal government for school lunch, military or other federal facility food services.

Many members of this committee will be dealing with these issues for the first time, and NPPC stands ready and willing to work with you to provide the detailed implications of any legislative initiative that may be brought to you under the guise of "animal protection."

Market Structure and Information

In the past 25 years, the U.S. pork industry has undergone a dramatic transformation in response to pressures to compete, both in the domestic market against competing proteins and in the export market against the pork industries in other countries. Although the process of restructuring is ongoing, and the merits of this industry restructuring are still being debated, the net result is that the U.S. pork industry has held its ground domestically and has made major inroads in export markets. The U.S. now has one of the most competitive pork industries in the world but still faces challenges both from other meat sources and from other countries, such as Canada and Brazil. The pork industry has done well because of the variety of marketing options available to pork producers. Open and transparent hog markets are working well for the pork industry. U.S. hog and pork markets work because pork producers and packers are able to use any of several methods to market and price pigs. These include spot market transactions, cooperatives, bargaining associations and contractual arrangements. We support the right of all producers of any size or type or production system to market access, and we are opposed to anything that hinders that access. Furthermore, we do not believe that U.S. pork producers will be well-served by eliminating or requiring any particular marketing or pricing mechanism. The reason that this wide variety exists is that some producers believe each method is the best for their farm. Limiting their choices can do nothing but hurt their well-being.

Pork producers continue to need accurate and complete price and quantity information such as that found in the reports created by the Livestock Mandatory Price Reporting Act of 1999. It is imperative that this Act be renewed soon to ensure that these data, which help producers make business and production decisions, continue to be available to all market participants. The House last year passed a bill (H.R. 3408) reauthorizing the mandatory price reporting law for five years and adding several swine-specific reporting changes. The measure was strongly supported by pork producers. However, the Senate has yet to take action on the measure, and the law expired on September 30, 2005. Since then, the prices paid for hogs have been reported voluntarily. While this voluntary reporting is maintaining stable prices for pork and beef, sheep industry prices have collapsed under voluntary reporting. We remain concerned about the slow erosion of voluntary reporting in the pork sector. NPPC would like to see the mandatory price reporting law reauthorized before the 2007 Farm Bill is crafted, but should there be no resolve, we support the inclusion of LMRA in the Farm Bill.

An issue that would affect pork producers' ability to adapt to consumer demand is country of origin labeling (COOL). A provision mandating COOL was included in the 2002 Farm Bill. But mandatory COOL, the implementation of which has been delayed, would add costs to producers without providing consumers additional assurances about the safety of their food. Pork producers continue

to support a voluntary program similar to the USDA process-certified program used for organics. This approach does not come at the expense of pork producers. To answer consumer demands for specific products, the U.S. pork industry is transforming from an industry with a commodity orientation to one with brand orientation.

CONCLUSION

As the Agriculture Committee begins to craft the 2007 Farm Bill, please keep in mind that pork producers are working to maintain, strengthen and defend their competitive advantage both domestically and internationally.

On behalf of the National Pork Producers Council and the many pork producers we represent, thank you for holding this hearing and allowing us to share our thoughts. We respectfully request your continued and focused attention on the matters we have brought to you today, and we look forward to working with the committee.

Print version of this document

ATTACHMENT 16

MAJOR ARTICLE

Antimicrobial-Resistant and Extraintestinal Pathogenic *Escherichia coli* in Retail Foods

James R. Johnson,[1,3] Michael A. Kuskowski,[2,4] Kirk Smith,[5] Timothy T. O'Bryan,[1,3] and Sita Tatini[6]

[1]Mucosal and Vaccine Research Center and [2]Geriatric Research, Education, and Clinical Center, Veterans Affairs Medical Center, Departments of [3]Medicine and [4]Psychiatry, University of Minnesota, and [5]Minnesota Department of Health, Minneapolis, and [6]Department of Food Science and Nutrition, College of Agricultural, Food, and Environmental Sciences, University of Minnesota, Saint Paul

(See the editorial commentary by Jones and Schaffner, on pages 1029–31.)

Background. Extraintestinal *Escherichia coli* infections are associated with specialized extraintestinal pathogenic *E. coli* (ExPEC) strains and, increasingly, with antimicrobial resistance. The food supply may disseminate ExPEC and antimicrobial-resistant *E. coli.*

Methods. In a prospective survey of 1648 diverse food items from 10 retail markets in the Minneapolis–St. Paul area during 2001–2003, selective cultures and disk-diffusion assays for the isolation and characterization of antimicrobial-resistant *E. coli* and polymerase chain reaction–based assays and O serotyping to define ExPEC-associated traits were performed.

Results. *E. coli* contamination exhibited a prevalence gradient from miscellaneous foods (9%), through beef or pork (69%), to poultry (92%; $P < .001$). Among *E. coli*–positive samples, similar prevalence gradients were detected for antimicrobial resistance (27%, 85%, and 94% of samples, respectively; $P < .001$) and ExPEC contamination (4%, 19%, and 46%, respectively; $P < .001$). By multivariate analysis, beef or pork and poultry from natural-food stores exhibited reduced risks of *E. coli* contamination and antimicrobial resistance. Indirect evidence suggested on-farm selection of resistance. Four food-source ExPEC isolates (from pea pods, turkey parts, ground pork, and vegetable dip) closely resembled selected human clinical isolates by O antigen and genomic profile.

Conclusions. Retail foods may be an important vehicle for community-wide dissemination of antimicrobial-resistant *E. coli* and ExPEC, which may represent a newly recognized group of medically significant foodborne pathogens.

Extraintestinal infections caused by *Escherichia coli* are responsible for several million episodes of urinary tract infection (UTI), an estimated 36,000 deaths from sepsis, and billions of dollars in increased health-care costs annually in the United States [1]. Emerging resistance to first-line antimicrobial agents increases the clinical impact of these infections and complicates their management [1–3]. Acquired antimicrobial resistance is particularly problematic when it occurs in extraintestinal pathogenic *E. coli* (ExPEC), the distinctive *E. coli* strains that possess the specialized virulence factors (VFs) required for extraintestinal disease [4]. Improved understanding of the origins and transmission pathways of antimicrobial-resistant *E. coli* and ExPEC is needed.

Several studies have suggested that foods might be a source of human-acquired antimicrobial-resistant *E. coli* and/or ExPEC. The food supply is an established vehicle for certain other antimicrobial-resistant and/or pathogenic bacteria—notably, *Salmonella enterica, Campylobacter jejuni, Listeria monocytogenes,* and *E. coli* O157:H7 [5–12]. Meat and poultry products at slaughtering operations can be extensively contaminated with *E. coli* of animal origin, including strains that express ExPEC-associated O antigens and/or are antimicrobial resistant [13, 14]. Antimicrobial-resistant *E. coli* strains also occur in some retail meats and poultry [15, 16]. Hospital and cafeteria foods may contain *E. coli,* with possible subsequent transmission to consumers [17, 18]. Food-source organisms can contaminate kitchens during meal preparation [19], and cooks can acquire

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Reprints or correspondence: Dr. James R. Johnson, Infectious Diseases (111F), Minneapolis VA Medical Center, 1 Veterans Drive, Minneapolis, MN 55417 (johns007@umn.edu).

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resistant *E. coli* from poultry carcasses without consuming the food [20]. Diverse other foods, including ready-to-eat foods, apple juice, and sprouts [11, 12, 21], may also contain *E. coli*.

However, few current data are available regarding the contamination of retail foods with *E. coli,* specifically resistant strains and ExPEC, or assessing the impact of store type and organic or antibiotic-free labeling. Such data are needed for consumers to make informed choices and for producers and regulators to establish appropriate public policies [22] and to implement appropriate monitoring systems and/or interventions [5, 23, 24]. Accordingly, we conducted a 2-year retail market survey, systematically sampling diverse foods for antimicrobial-resistant *E. coli* and ExPEC.

MATERIALS AND METHODS

Food sampling scheme. From May 2001 through May 2003, foods were purchased in rotation from 10 retail markets in the Minneapolis–St. Paul area. These included 2 representatives each of large luxury and economy chains (defined based on amenities, ambience, decor, product selection, and pricing), small neighborhood markets, natural-foods markets (including 1 outlet each of a multistate chain and a locally owned cooperative; hereafter, "natural store"), and farmer's markets (summers only). Each week, 27 items were purchased from a different store, according to a schedule that distributed purchases at that store in strict rotation among 63 food types. The purchaser selected specific items and brands within the specified food type at his or her discretion. Unavailable items were omitted; purchasing resumed with the next available scheduled item. Purchases at a particular store cycled through the entire schedule sequentially, despite interruptions. The schedule was initiated in a staggered fashion at different stores, such that, at all times, purchases were being made from different parts of the schedule. Foods purchased (number of samples) included beef (70), pork (68), chicken (56), turkey (133), and blended chicken and turkey (6) (all raw; variably ground and/or frozen); fresh fruits (399) and vegetables (468); and miscellaneous foods, including fermented or processed items—cheese (70), dry salami (67), cooked turkey franks (61), fish (65), crab (28), shrimp (36), delicatessen items (67), and cream or custard pastries (54). Unwrapped items were placed individually in clean plastic bags by use of disposable gloves. Items were refrigerated or frozen until processing. Items were considered to be organic or antibiotic-free if so characterized by the label, store, or producer. The experimentation guidelines of the authors' institutions were followed in the conduct of clinical research.

Culture methods. By use of a sterile technique, food items were weighed and manually rinsed (produce or poultry parts containing bones) or were mechanically dispersed (other foods; Stomacher blender; Seward Medical) in defined volumes of lauryl-tryptose broth (Difco), 1 mL of which was plated onto Petrifilm (3M), both immediately (undiluted), to detect high-level contamination, and after incubation with the food for 48 h at 37°C (10^{-6} dilution), to detect trace contamination. Blue colonies with gas were counted as presumptive *E. coli* [25] and were confirmed by use of an API 20-E system (bio-Merieux). Bacterial quantification was by done by plate counts or, for samples that tested positive only after amplification, by a 3-tube, 3-replicate most probable number method [25]. From each *E. coli*–positive sample, an arbitrarily selected index *E. coli* isolate, up to 12 additional *E. coli* colonies (which were pooled), and a sweep of mixed bacterial growth were saved. The amplified broth was plated onto modified Mueller-Hinton agar [26] that contained ampicillin (32 mg/L), tetracycline (16 mg/L), nalidixic acid (32 mg/L), ceftazidime (32 mg/L), or trimethoprim (16 mg/L), for overnight incubation at 37°C. Presumptive *E. coli* were confirmed by use of an API-20E system.

Antimicrobial resistance. Index isolates and each sample's most resistant *E. coli* isolate (identified through replica plating onto the above-mentioned antimicrobial-containing agars) underwent standardized disk-diffusion susceptibility testing to ampicillin, amoxicillin-clavulanate, cefazolin, ceftazidime, gentamicin, tetracycline, nitrofurantoin, nalidixic acid, ciprofloxacin, sulfisoxazole, trimethoprim, and trimethoprim-sulfamethoxazole [27, 28].

Detection of ExPEC. Lysates of each sample's index *E. coli* isolate, pooled *E. coli* colonies, mixed growth, and most resistant *E. coli* isolate were tested by polymerase chain reaction (PCR) for *hlyD* (hemolysin) and ExPEC status [29]. On the basis of previous statistical analyses of strain collections within which the extraintestinal virulence capability was determined either experimentally or on the basis of clinical source, ExPEC was defined by detection of $\geqslant$2 of *papA* and/or *papC* (P fimbriae), *sfa/foc* (S/F1C fimbriae), *afa/dra* (Dr-antigen-binding adhesins), *kpsM* (group 2 capsule), and *iutA* (aerobactin) [29]. ExPEC-positive samples were further tested for 35 ExPEC-associated VFs [29]; such testing predicts experimental in vivo virulence and differentiates among various clonal groups of ExPEC [30, 31].

Serotyping and phylotyping. O antigens were determined by the *E. coli* Reference Center (University Park, PA) by use of 180 O–specific antisera. O antigens associated with UTI (O-UTI) were defined as O1, O2, O4, O6, O7, O16, O18, O25, and O75 [32]. *E. coli* phylogenetic group (A, B1, B2, and D) was defined by triplex PCR [33].

Comparison with human clinical ExPEC. To assess whether foodborne *E. coli* resembles human clinical isolates, food-source ExPEC isolates that expressed O-UTI antigens or O11/O17/O77, which have been associated with the recently described *E. coli* "clonal group A" [34, 35], were compared, according to virulence profile and/or O antigen, with human clinical isolates from the investigator's collections (J.R.J.). (These collections

include isolates from cystitis and pyelonephritis in women, neonatal meningitis in children, febrile UTI in men, and diverse-source bacteremia in adults.) Food-source isolates were compared with the corresponding human isolates by random amplified polymorphic DNA (RAPD) analysis [36], to assess for genomic similarity.

Statistical methods. Three prespecified food classes were defined for analysis: poultry (raw), beef/pork (raw), and miscellaneous foods (including produce and processed foods) (table 1). Aggregate resistance and virulence scores were the number of resistance or virulence markers detected. Year of study was analyzed as a continuous variable (calendar year 1, 2, or 3), to identify secular trends. Unpaired comparisons were tested by use of Fisher's exact or χ^2 test for proportions or by use of the Mann-Whitney *U* test for scores (all 2-tailed). Paired comparisons were tested by use of McNemar's test for proportions or by use of the Wilcoxon rank sum test for scores. Multiple predictor variables associated with selected microbiological outcomes were identified by use of multiple logistic regression models in which the outcome variable of interest was the dependent variable and all relevant source characteristics for the particular food class were simultaneous predictor variables (see table 2, footnote a, for a list of predictor variables).

RESULTS

***Prevalence of* E. coli.** During the 2-year survey, 1648 retail food items were cultured. Of these, 396 (24%) yielded *E. coli*. Contamination with *E. coli* varied by food class, with a significant difference among miscellaneous items (produce and other nonmeat or poultry items, 9%), meats (beef or pork, 69%), and poultry (92%) ($P < .001$ for all comparisons of each food class vs. another food class or all other foods combined) (figure 1*A*). Detection of *E. coli* by direct plating likewise varied significantly by food class (0.7%, 5%, and 16% of miscellaneous, beef or pork, and poultry samples, respectively: $P \leq .002$ for all comparisons). Overall, *E. coli* counts were significantly higher in samples that tested positive by direct plating, compared with samples that tested positive only after broth amplification (median, 20 vs. <1.0 cfu/g; $P < .001$).

Among the miscellaneous foods, *E. coli* contamination varied by food type. No *E. coli* was detected in iceberg lettuce, cauliflower, plums, strawberries, raspberries or blackberries, grapes, pineapple, kiwi fruit, or cream pastry (overall, 0/231 samples vs. 121 (11%) of 1087 other miscellaneous food samples; $P < .001$). In contrast, *E. coli* was detected in >25% of samples each of cucumber/zucchini, spinach, corn, mushrooms, and shrimp (overall, 32% of 153 samples vs. 6% of 1165 other miscellaneous food samples; $P < .001$). Likewise, *E. coli* was directly detectable (indicating more intense contamination) in ⩾1 sample each for cucumber or zucchini, potatoes, green onions, fish, and turkey frankfurters (overall, 9/232 samples [4%] vs. 0/1086 other miscellaneous food samples; $P < .001$).

Because of the marked differences between the main food classes, subsequent analyses were stratified by food class. Within each food class and among classes, complex patterns of association were observed for the various predictor variables according to univariate analysis (table 1). Therefore, multiple logistic regression analysis was used to identify multiple pre-

Table 1. Predictors of *Escherichia coli,* resistant *E. coli,* and virulence traits among 1648 retail food items, by univariate analysis.

		Predictor variable[a]							
Food class (no. of samples)	Outcome variable[b] (no. positive)	Natural store	Antibiotic free	Farmer's market	Ground	Frozen	Season (summer/ autumn)	Year (secular trend)	Subgroup within food class
Miscellaneous (1315)	*E. coli* (121)	–	…	↑	…	…	↑	–	–
	Resistance (31)	–	…	–	…	…	↑	↓	Other (nonproduce) ↑
	ExPEC (5), O-UTI (12)	–	…	–	…	…	–	↓	–
Beef/pork (138)	*E. coli* (95)	↓	↓		↑	–	–	–	Pork ↑
	Resistance (73)	↓	↓	…	–	–	↑	↑	Pork ↑
	ExPEC (18), O-UTI (13)	–	–	…	↑	–	↓	↑	Pork ↑
Poultry (195)	*E. coli* (180)	↓	↓[c]	…	↑	↑	↑	↑	–
	Resistance (165)	–	–	…	–	–	↓	↓	Turkey ↑
	ExPEC (83), O-UTI (28)	–	–	…	–	–	↓	↓	Turkey ↑

[a] Predictor variables included natural store (vs. other store), antibiotic-free (vs. other or unknown), farmer's market (vs. other store), ground (vs. not ground), frozen (vs. not frozen), year (for secular trend), produce (vs. other miscellaneous foods), pork (vs. beef), and turkey (vs. chicken). Arrows (↓ and ↑), significant negative and positive associations, respectively ($P < .05$), with a positive trend for "year" indicating an increase over time; ellipses (…), predictor variable not applicable to indicated food class; –, no significant effect detected.

[b] Outcome variables included *E. coli,* antimicrobial-resistant *E. coli* (no. shown is for resistance to ⩾1 drug; associations are noted for resistance to ⩾1 drug and/or to ⩾5 drugs), ExPEC (extraintestinal pathogenic *E. coli,* defined as positivity for ⩾2 of *papA* and/or *papC* [P fimbriae], *sfa/foc* [S and F1C fimbriae], *afa/dra* [Dr-family adhesins], *kpsM* II [group 1 capsule], and *iutA* [aerobactin receptor]), and O-UTI (O antigens associated with urinary tract infection, i.e., O1, O2, O4, O6, O7, O16, O18, O25, and O75). Analyses involving *E. coli* included all samples. Analyses of antimicrobial resistance, ExPEC status, and O-UTI status were limited to samples that contained *E. coli.*

[c] The association of "antibiotic free" with *E. coli* changed from negative to positive in the multivariate analysis.

Table 2. Predictors of *Escherichia coli,* antimicrobial-resistant *E. coli,* and *E. coli* virulence markers in retail foods, by multiple logistic regression analysis.

Characteristic[b] (no. of samples in analysis)[c]	Food class (no. of samples in analysis)[c]	Significant predictor variables[a]		
		Variable	*P*	OR (95% CI)
E. coli (1648)	Miscellaneous (1315)	Summer/autumn	.001	2.02 (1.31–3.11)
	Beef/pork (138)	Natural store	.02	0.11 (0.02–0.72)
		Ground	<.001	5.93 (2.30–15.3)
	Poultry (195)	Year	.007	5.86 (1.63–21.06)
		Natural store	.002	0.04 (0.005–0.32)
		Antibiotic free	.007	13.13 (2.06–83.91)
		Frozen	.03	3.15 (1.11–8.93)
Resistant *E. coli* (384)	Beef/pork (93)	Beef	.006	0.15 (0.04–0.59)
		Natural store	.02	0.04 (.003–0.61)
	Poultry (175)	Summer/autumn	.001	0.23 (0.10–0.56)
		Year	.04	0.50 (0.26–0.96)
ExPEC and/or O-UTI (390)	Beef/pork (94)	Summer/autumn	.045	0.27 (0.08–0.97)
		Beef	.03	0.09 (0.01–0.81)
	Poultry (179)	Summer/autumn	<.001	0.20 (0.09–0.41)
		Year	<.001	0.39 (0.23–0.66)

[a] Predictor variables included, for miscellaneous foods, produce (vs. other), organic (vs. other or unknown), natural store (vs. other store), farmer's market (vs. other store), year (for secular trend; odds ratios [ORs] indicate the proportional increase or decrease per year), and season (summer/autumn vs. winter/spring); for beef or pork, beef (vs. pork), natural store (vs. other store), antibiotic-free (vs. other or unknown), ground (vs. not ground), frozen (vs. not frozen), year (for secular trend; ORs indicate the proportional increase or decrease per year), and season (summer/autumn vs. winter/spring); and, for poultry, chicken (vs. turkey), natural store (vs. other store), antibiotic-free (vs. other or unknown), ground (vs. not ground), frozen (vs. not frozen), year (for secular trend; ORs and confidence intervals [CIs] indicate the proportional increase or decrease per year) and season (summer/autumn vs. winter/spring). Only variables yielding $P < .05$ are shown. Among miscellaneous foods, no significant predictors were identified for "Resistant *E. coli*" or "ExPEC and/or O-UTI."

[b] Outcome variables included *E. coli* (from direct plating and/or broth amplification), antimicrobial-resistant *E. coli* (resistance to ⩾1 drug), ExPEC (extraintestinal pathogenic *E. coli,* defined as positivity for ⩾2 of *papA* and/or *papC* [P fimbriae], *sfa/foc* [S and F1C fimbriae], *afa/dra* [Dr-family adhesins], *kpsM* II [group 1 capsule], and *iutA* [aerobactin receptor]), and O-UTI (O antigens associated with urinary tract infection, i.e., O1, O2, O4, O6, O7, O16, O18, O25, and O75). Antimicrobial resistance, ExPEC markers, and O-UTI antigens were as detected in index *E. coli* isolates or total samples.

[c] Analyses for *E. coli* included all samples. Analyses of antimicrobial resistance, ExPEC status, and O-UTI status were limited to those *E. coli*–containing samples available for susceptibility testing, molecular analysis, and/or serotyping.

dictors of total and direct *E. coli* contamination (table 2). Among miscellaneous foods, the only significant multivariate predictor of *E. coli* contamination was season, with summer or autumn purchase predicting a higher risk. Among beef and pork items, natural-store source predicted a reduced risk of *E. coli,* whereas being ground was a risk factor. Among poultry items, year of study and being frozen were both risk factors for total *E. coli,* whereas, for direct *E. coli,* natural-store source predicted reduced risk, but antibiotic-free labeling was actually a risk factor (table 2).

Antimicrobial resistance. With the analysis limited to *E. coli*–positive food samples, the prevalence of antimicrobial resistance varied significantly by food class, from miscellaneous foods (lowest) to poultry (highest), whether analyzed as resistance to ⩾1 drug, to ⩾5 drugs, or to each drug individually (figure 1*B*). Ciprofloxacin resistance exhibited a borderline significant association with poultry (3.4% of samples vs. 0.5% for all other foods: $P = .051$). Nalidixic acid resistance also was associated with poultry (30% of samples vs. 2.5% for miscellaneous foods and 3% for beef or pork; $P < .001$) (figure 1*B*); among nonpoultry items, this was confined to beef (3/47 [6%] vs. 0/161; $P = .01$). Aggregate resistance scores exhibited a similar by-food-class gradient, with median scores among *E. coli*–positive miscellaneous, beef or pork, and poultry items, respectively, being 0, 1.0, and 2.0 (index isolate); 0, 2.0, and 4.0 (most-resistant isolate); and 0, 1.0, and 5.0 (total sample) ($P < .001$ for miscellaneous or poultry vs. all others).

Because of these differences, analyses again were stratified by food class. In univariate analyses for resistance to individual drugs (table 3), among *E. coli*–positive miscellaneous items, nonproduce foods exhibited a higher prevalence of tetracycline and sulfisoxazole resistance than did produce, and summer or autumn purchase was associated with increased ampicillin resistance, compared with that for winter or spring purchase. Among *E. coli*–positive beef and pork items, pork exhibited a higher prevalence of ampicillin, tetracycline, and sulfisoxazole resistance than did beef, whereas natural-store source and antibiotic-free purchase predicted decreased tetracycline and ampicillin resistance, respectively. Among *E. coli*–positive poultry items, turkey was associated with nalidixic acid, sulfisoxazole, and trimethoprim-sulfamethoxazole resistance; chicken with resistance to β-lactam agents; winter or spring purchase with

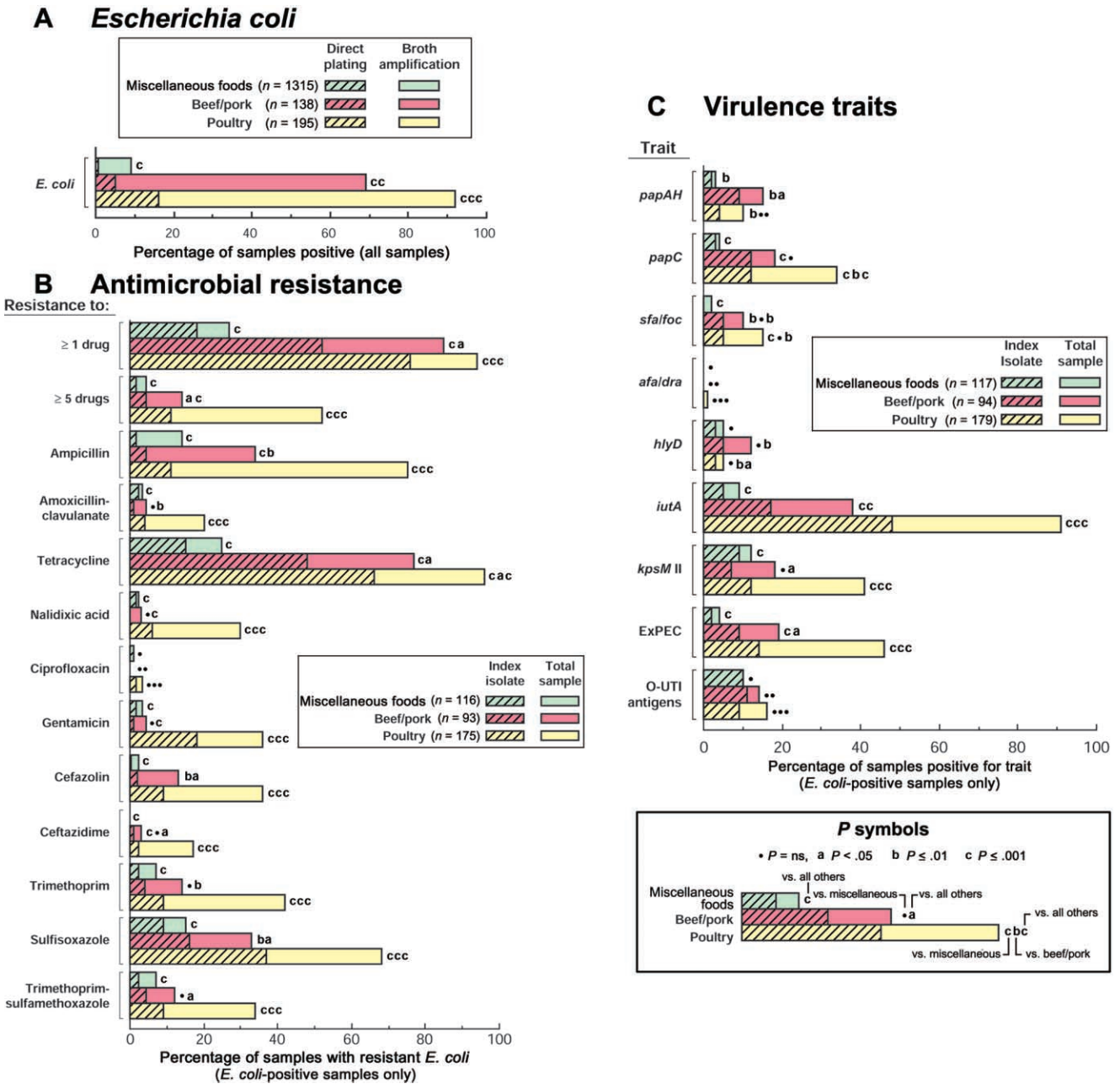

Figure 1. Prevalence of *Escherichia coli,* antimicrobial-resistant *E. coli,* and *E. coli* virulence-associated traits in retail foods. *A,* Prevalence of *E. coli* (as detected by direct plating, reflecting high-grade contamination, or by broth amplification, reflecting even trace contamination) among 1648 retail food items, stratified by food class (miscellaneous foods, beef or pork, and poultry). *B,* Prevalence of *E. coli* antimicrobial resistance (as detected in the index isolate, reflecting the sample's predominant strain, or in the total sample), both overall and to 11 individual drugs, among 384 *E. coli*–positive food samples, stratified by food class. (No resistance to nitrofurantoin was detected.) *C,* Prevalence of *E. coli* virulence-associated traits (as detected in the index isolate, reflecting the sample's predominant strain, or in the total sample) among 390 *E. coli*–positive food samples, stratified by food class. ExPEC, extraintestinal pathogenic *E. coli,* defined as detection of ⩾2 of (*papA* and/or *papC*), *sfa/foc, afa/dra, kpsM* II, and *iutA;* O-UTI, O antigens associated with urinary tract infection (O1, O2, O4, O6, O7, O16, O18, O25, and O75) [32]. *P* symbols (from χ^2 test or Fisher's exact test) are for comparisons between food classes for the particular outcome variable and apply only to comparisons involving broth amplification *(A)* or total sample *(B* and *C).* The position of the *P* symbol indicates which groups were compared. (The total prevalence of resistant or virulent *E. coli* can be derived by multiplying the overall prevalence values for *E. coli [A]* by the prevalence values shown for antimicrobial resistance *[B]* and virulence characteristics *[C],* because the latter were calculated for *E. coli*–positive samples only.) ns, not significant.

Table 3. Prevalence of resistance to individual antimicrobial agents by food group among 384 *Escherichia coli*–positive retail food items.

Food class	Comparison groups[a]		Resistance to[b]	Prevalence of resistance (%)[b]		P[c]
	Group 1	Group 2		Group 1	Group 2	
Miscellaneous	Other foods	Produce	Tetracycline	37	20	.04
			Sulfisoxazole	26	10	.03
	Summer/autumn	Winter/spring	Ampicillin	18	3	.04
Beef/pork	Pork	Beef	Ampicillin (ii)[b]	22	4	.01
			Tetracycline (ii)[b]	64	32	.002
			Sulfisoxazole (ii)[b]	24	9	.04
	Natural store	Other	Tetracycline	47	65	.002
	Antibiotic free	Other	Ampicillin	15	40	.04
Poultry	Turkey	Chicken	Nalidixic acid	34	16	.02
			Sulfisoxazole (ii)[b]	43	23	.02
			Trimethoprim-sulfamethoxazole (ii)[b]	12	0	.01
			Amoxicillin-clavulanate	12	36	<.001
			Cefazolin	23	67	<.001
			Ceftazidime	12	26	.02
	Summer/autumn	Winter/spring	Ampicillin	64	84	.003
			Gentamicin (ii)[b]	9	24	.009
			Sulfisoxazole (ii)[b]	29	44	.049
	Natural store	Other	Tetracycline	98	87	.045
	Antibiotic free	Other	Nalidixic acid (ii)[b]	0	8	.03

[a] Comparison groups (5 categories for miscellaneous foods and 6 categories each for beef/pork and poultry) were based on the variables shown in table 2, excluding year. Only comparisons that yielded $P < .05$ are shown. For each food type, the no. of index isolates (no. of samples) was nonproduce miscellaneous foods, 31 (35); produce, 81 (82); pork, 45 (47); beef, 47 (47); turkey, 119 (121); and chicken, 47 (49).

[b] Comparisons were made for 11 antimicrobial agents. (No resistance was detected to nitrofurantoin.) Data shown are for total sample, or index isolate (ii) if so indicated.

[c] Fisher's exact test or χ^2 test (2-tailed).

ampicillin, gentamicin, and sulfisoxazole resistance; natural-store source with tetracycline resistance; and antibiotic-free labeling with reduced nalidixic acid resistance. In analyses of aggregate resistance scores among *E. coli*–positive samples, for beef and pork items, pork outscored beef, whereas natural-store source and antibiotic-free purchase predicted reduced resistance; for poultry items, turkey outscored chicken (table 4).

By multiple logistic regression analysis for predictors of resistance to ≥ 1 drug or to ≥ 5 drugs, among miscellaneous foods, no significant predictors were identified. However, for beef/pork items both beef and natural-store source predicted reduced risk, whereas for poultry items both season and year predicted reduced risk (table 2).

Virulence-associated traits. Among *E. coli*–positive samples, the prevalence of virulence-associated traits again was usually lowest among miscellaneous foods, intermediate in beef and pork, and highest in poultry (e.g., 4%, 19%, and 46% of *E. coli*–positive samples, respectively, were ExPEC positive; $P < .001$) (figure 1*C*). Among miscellaneous foods, multivariate analysis identified no significant predictors of ExPEC or O-UTI status. For beef and pork, significant multivariate predictors of ExPEC or O-UTI status included summer or autumn purchase and beef (both with a reduced risk), whereas for poultry, significant predictors included summer or autumn purchase and year of study (both with a reduced risk) (table 2).

Extended virulence genotyping of the ExPEC-positive samples detected all but 3 of 35 VFs sought. Fourteen markers were significantly distributed by food class, including 7 at the $P \leq .001$ level (not shown), which provides evidence of food-class–specific ExPEC populations.

Seventeen isolates, all from phylogenetic groups B2 or D, met molecular criteria for ExPEC and exhibited O-UTI antigens or O11/O17/O77 antigens, consistent with possible human pathogenic potential. Two were from miscellaneous foods, 5 from beef or pork, and 10 from poultry, thus constituting 0.2%, 3.6%, and 5.1% of all samples in their food classes ($P < .001$). Four of these isolates (from pea pods, turkey parts, ground pork, and vegetable dip) were indistinguishable according to RAPD profiling from selected human clinical isolates from the investigators' collections (figure 2). One of these food isolates corresponded with the recently described *E. coli* clonal group A, a disseminated cause of multidrug-resistant cystitis and pyelonephritis that, within one community, exhibited unexplained point-source spread [34, 35].

***Comparison of resistant and susceptible* E. coli.** To assess their degree of commonality, the resistant and susceptible *E.*

Table 4. Aggregate antimicrobial resistance scores by food group among 379 *E. coli*–containing retail food samples.

Food class (no.)	Comparison groups (no.)[a]		Aggregate resistance score, median[b]		
	Group 1	Group 2	Group 1	Group 2	P[c]
Miscellaneous (116)	Produce (81)	Other (35)	0.3[d]	1.1[d]	.04
Beef or pork (93)	Pork (46)	Beef (47)	1.0	0	.003
	Natural store (17)	Other stores (76)	0	2.0	.01
	Antibiotic-free (20)	Other/unknown (73)	1.0	2.0	.01
Poultry (170)[e]	Turkey (121)	Chicken (49)	2.3[d]	1.6[d]	.04

[a] Comparison groups (5 categories for miscellaneous foods and 6 categories each for beef/pork and poultry) were based on the variables shown in table 2, excluding year. Only comparisons that yielded $P < .05$ are shown.
[b] Results shown are for comparisons of most-resistant isolates or index isolates, whichever yielded the lowest P value for the particular comparison.
[c] Mann-Whitney U test for nonparametric continuous data.
[d] Result shown is 5% trimmed mean (i.e., the mean after excluding the outlying 5% of values), because both groups exhibited the same median value.
[e] Five poultry samples (of 175 with resistance scores) were mixed (turkey and chicken) patties and so could not be analyzed for turkey vs. chicken.

coli isolates within each food class were compared for phylogenetic background, VFs, and O antigens. Only 7 (3.8%) of the resulting 180 comparisons yielded $P < .05$, and only 2 (1%) yielded $P \leq .01$—evidence of considerable intrinsic similarity between the resistant and susceptible populations within each food class. In contrast, with the same by-food-class stratification, when phylogenetic group B2/D *E. coli* isolates were compared with non-B2/D *E. coli* isolates, according to VFs and O antigens, 26 (29%) of the resulting 90 comparisons yielded $P < .05$, whereas 16 (21%) yielded $P \leq .01$, and 10 (11%) yielded $P \leq .001$, which demonstrates extensive diversity within each food-class–specific population, despite the near absence of differences according to resistance status.

DISCUSSION

In our 2-year prospective market survey, we found that many retail foods, particularly poultry but also beef or pork and certain ready-to-eat items, were contaminated with antimicrobial-resistant *E. coli* and ExPEC. This is particularly alarming, given the rising prevalence of antimicrobial resistance among clinical *E. coli* isolates, the evidence of transmission of other foodborne bacteria to consumers and food preparers, and the recent unexplained dissemination of multidrug-resistant ExPEC clones [2, 20, 34, 35].

Extraintestinal *E. coli* are responsible for millions of UTI episodes, an estimated 36,000 deaths from sepsis, and billions of dollars in health-care costs annually in the United States [1]. This dwarfs the disease burden associated with the notorious *E. coli* O157:H7, which, as a foodborne pathogen, causes an estimated 62,458 infections and 52 deaths annually in the US [5]. Thus, if even a small fraction of extraintestinal *E. coli* infections involve foodborne ExPEC or resistance elements, a possibility that is supported by our demonstration of a close resemblance between certain foodborne and human clinical ExPEC isolates, ExPEC may rival (or exceed) *E. coli* O157:H7 as a foodborne pathogen. Our findings therefore have considerable potential public-health and medical significance.

The highest prevalences and densities of resistant *E. coli* and ExPEC were found in meat products. This is consistent with contamination of animal carcasses with the host's fecal flora during slaughter and processing and with use of antimicrobial agents in food-animal production [13, 14]. In contrast, produce and other miscellaneous food items (including cheeses, salami, delicatessen items, turkey franks, and pastry products) were comparatively devoid of *E. coli*. Thus, although produce has been associated with antimicrobial-resistant gram-negative bacilli [37], and the other miscellaneous foods sometimes carry different pathogens and/or generic *E. coli* [8, 10, 21, 38], our data suggest that these foods represent relatively less important vehicles for antimicrobial-resistant *E. coli* or ExPEC than do meat and poultry. However, because ready-to-eat foods are consumed without being cooked, even infrequent or low-level contamination may pose a substantial risk. Of note, 2 of the food-source *E. coli* that we matched to human clinical isolates were from ready-to-eat foods. The bacterial inoculum size required for establishing colonization with ingested ExPEC or transfer of foodborne resistance elements to endogenous human gut *E. coli* is undefined but may not be large, because the ingestion of <100 viable cells of *Shigella dysenteriae,* an *E. coli* variant, is sufficient to cause disease in humans.

The present study provides an assessment of the microbial content of organic and natural foods, which have been presumed to be less likely to contain antimicrobial-resistant bacteria [39]. By multivariate analysis, natural-store source did

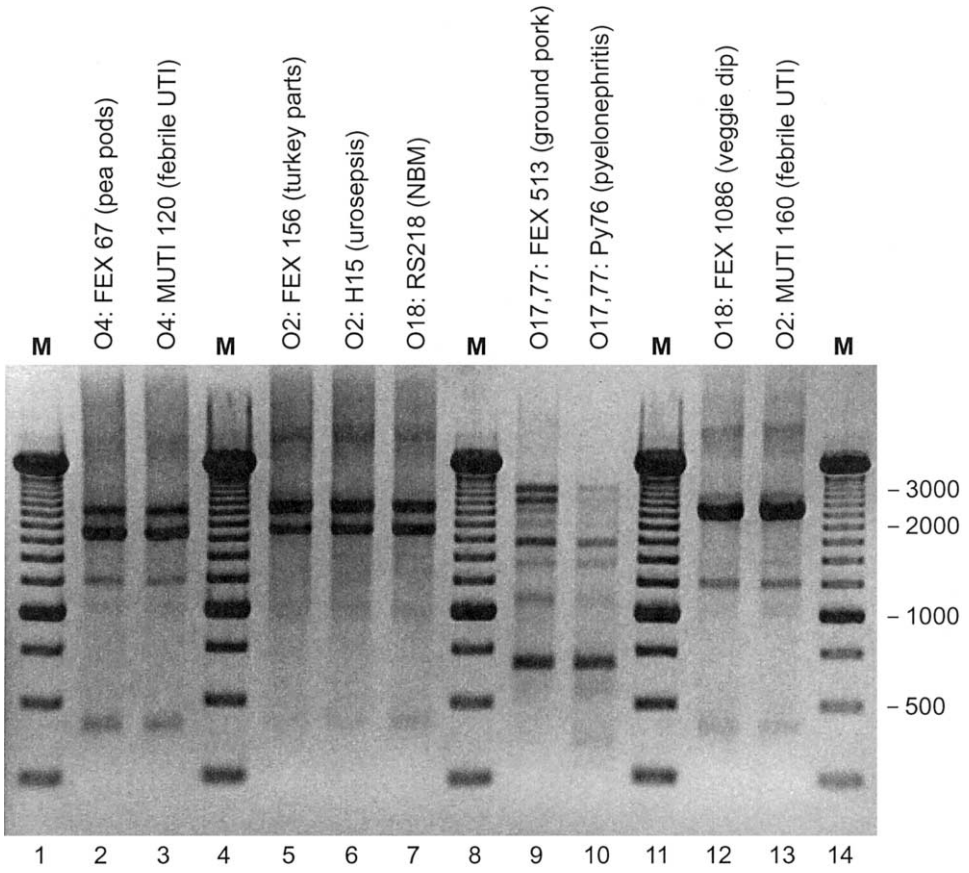

Figure 2. Random amplified polymorphic DNA (RAPD) profiles of selected *Escherichia coli* isolates from retail foods and infected humans. Profiles were done by use of arbitrary decamer primer 1283 (5′-gcgatcccca -3′) [36]. Lane nos. are shown below the gel image. Food-source isolates (*lanes* 2, 5, 9, and 12) have FEX designations. Each isolate's O antigen and ecological source (i.e., food type or clinical syndrome) are shown above the gel image. FEX 1086 exhibited ampicillin, tetracycline, gentamicin, sulfisoxazole, trimethoprim, and trimethoprim-sulfamethoxazole resistance; the other FEX isolates were susceptible to all agents tested. Serotypes of human clinical isolates are: O4:K2:H5 (strain MUTI 120), O2:K1:H7 (strain H15), O18:K1:H7 (strain RS218); O17,77:K52:H18 (strain Py76, which is a representative of *E. coli* clonal group A); and O2:H$^-$ (strain MUTI 160) (serotype data are from Peter Ulleryd, personal communication, and [35, 47, 48]). Markers (*lanes* 1, 4, 8, 11, and 14) are a 250-bp ladder (Gibco). UTI, urinary tract infection; NBM, neonatal bacterial meningitis.

predict a reduced risk of total and antimicrobial-resistant *E. coli* in beef or pork and of total *E. coli* in poultry. Paradoxically, antibiotic-free labeling actually was a multivariate risk factor for *E. coli* in poultry and, although it was negatively associated with certain resistance markers by univariate analysis, it was not a significant multivariate predictor of net resistance.

That natural-store source was a more potent (negative) predictor than antibiotic-free status for total and antimicrobial-resistant *E. coli* may be of immediate interest to consumers and raises questions as to underlying mechanisms. Presumably, undefined aspects of natural-store production and/or distribution are beneficial, which warrants further study. The lesser effect of antibiotic-free labeling should not be interpreted as indicating that on-farm antimicrobial use does not significantly influence local *E. coli* resistance patterns. Indeed, the favorable results of Denmark's ban on antimicrobial growth promoters suggest the opposite (http://www.who.int/salmsurv/links/gssamrgrowthreportstory/en/) [22]. More probably, on-farm effects may be obscured by downstream contamination—for example, in processing plants or from retail food handlers [23]. Likewise, labeling may misrepresent true on-farm antimicrobial use [40]. Indeed, information provided by certain producers of ostensibly antibiotic-free meats and poultry suggested that antimicrobial agents actually are administered to an unspecified proportion of their animals (J.R.J., unpublished data).

Two findings indirectly supported the hypothesis of on-farm resistance selection. The paucity of differences between the resistant and susceptible *E. coli* populations within each food class, in contrast to the marked differences between phylogenetic groups and food types, suggested that resistant and susceptible isolates within a given food class derive from a common source population, with resistance plausibly emerging on the farm [29]. Likewise, the (statistically or borderline significant) associations of ciprofloxacin and nalidixic acid resistance with

poultry and/or beef correspond with the approved agricultural use of fluoroquinolones in the United States only in these animals.

Our findings cause concern and indicate a need for further study to determine whether foodborne *E. coli* present a significant human health threat and, if so, to define the source of the problem. Additional studies are needed that compare food-source and human clinical isolates for resistance elements [41], genomic background [42], and virulence profiles [43] and that assess food-to-human transmission [9, 44]. The results would help establish the extent of commonality between food-source and human clinical isolates and estimate the contribution of foods to drug-resistant and/or ExPEC infections in humans. Studies of upstream food production steps are also needed, to determine the source(s) of the contamination and antimicrobial resistance [14]. Such information is required for root causes to be addressed—for example, through modified animal husbandry or distribution practices [22, 23] and/or by irradiating foods to eliminate pathogens and resistance elements before they reach consumers [45, 46].

In this regard, our finding that multiple variables (e.g. natural store, season, year, ground or frozen status, beef vs. pork, and chicken vs. turkey) were associated with significant differences in the prevalence of foodborne *E. coli,* antimicrobial resistance (including to specific drugs), and ExPEC suggests that these characteristics may provide clues to the origins of the observed contamination and selection of resistance. Discovery of the underlying causal links conceivably could identify opportunities for preventive interventions.

Limitations of the study include that foods were from 1 locale and 10 markets, which possibly limits generalizability, although the distributed nature of the food supply mitigates this concern. The sampling scheme, although highly structured, still allowed for possible bias. Because laboratory methods were not 100% sensitive, the results represent minimum estimates. Multiple comparisons allowed for possible type I errors (such that certain less statistically significant associations could represent chance findings), and small numbers within certain subgroups limited statistical power. Finally, food-to-human transmission was not directly studied, the source of the contaminating *E. coli* and antimicrobial resistance was not defined, and virulence potential was inferred from molecular and serological data rather than from experimentation.

In summary, we found that retail foods, particularly poultry products but also beef or pork items and certain ready-to-eat foods, are frequently contaminated with antimicrobial-resistant *E. coli* and/or ExPEC, in patterns that were significantly predicted by store type, specific food type, frozen or ground status (for meats), season, and year. Thus, the food supply may represent a significant but underrecognized vehicle for the dissemination of important pathogens and resistance elements. Clarification of the health significance and underlying mechanisms of these findings is needed to allow rational selective purchasing and appropriate remediation and control efforts.

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ATTACHMENT 17

Fate and transport of zoonotic, bacterial, viral, and parasitic pathogens during swine manure treatment, storage, and land application

C. J. Ziemer, J. M. Bonner, D. Cole, J. Vinjé, V. Constantini, S. Goyal, M. Gramer, R. Mackie, X. J. Meng, G. Myers and L. J. Saif

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Fate and transport of zoonotic, bacterial, viral, and parasitic pathogens during swine manure treatment, storage, and land application[1]

C. J. Ziemer,*[2] J. M. Bonner,† D. Cole,‡ J. Vinjé,§ V. Constantini,# S. Goyal,‖ M. Gramer,‖ R. Mackie,¶ X. J. Meng, G. Myers,†† and L. J. Saif‡‡**

*National Laboratory for Agriculture and the Environment, USDA-ARS, Ames, IA 50011; †Council for Agricultural Science and Technology, Ames, IA 50014; ‡Georgia Division of Public Health, Atlanta 30303; §Centers for Disease Control and Prevention, Atlanta, GA 30333; #The Ohio State University, Wooster 44691; ‖University of Minnesota, St. Paul 55108; ¶University of Illinois, Champaign 61820; **Virginia Polytechnic Institute and State University, Blacksburg 24061; ††Myers Parasitology Services, Magnolia, KY 42757; and ‡‡The Ohio State University, Columbus 43210

ABSTRACT: Members of the public are always somewhat aware of foodborne and other zoonotic pathogens; however, recent illnesses traced to produce and the emergence of pandemic H1N1 influenza virus have increased the scrutiny on all areas of food production. The Council for Agricultural Science and Technology has recently published a comprehensive review of the fate and transport of zoonotic pathogens that can be associated with swine manure. The majority of microbes in swine manure are not zoonotic, but several bacterial, viral, and parasitic pathogens have been detected. Awareness of the potential zoonotic pathogens in swine manure and how treatment, storage, and handling affect their survival and their potential to persist in the environment is critical to ensure that producers and consumers are not at risk. This review discusses the primary zoonotic pathogens associated with swine manure, including bacteria, viruses, and parasites, as well as their fate and transport. Because the ecology of microbes in swine waste is still poorly described, several recommendations for future research are made to better understand and reduce human health risks. These recommendations include examination of environmental and ecological conditions that contribute to off-farm transport and development of quantitative risk assessments.

Key words: manure application, manure storage, manure treatment, swine manure, zoonotic pathogen

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INTRODUCTION

Animal manure management systems in the United States are designed to store, treat, and apply to land solid, semisolid, slurry, or liquid manure (i.e., urine and fecal material) on agricultural fields after removal from the animal environment. Manure processed in swine management systems is usually in liquid (1 to 4% solids), slurry (4 to 15% solids), or semisolid form, and land application most often involves spreading on fields as fertilizer (Dickey et al., 1981; Copeland and Zinn, 1998; Hill, 2003). The majority of these management systems are designed to reduce the concentrations of microbes found in swine manure by 90 to 99% or more (Sobsey et al., 2005) and to prevent off-farm transport of manure materials (i.e., nondischarge systems). The majority of microbes contained in swine manure are not pathogenic to humans (i.e., zoonotic). Nonetheless, the effectiveness of swine manure management systems to prevent environmental contamination with human pathogens is a concern because there are several putative environmental transmission pathways by which these zoonotic pathogens may be transported to water resources.

Manure treatment systems may include multiple mechanisms of physical, biological, or chemical treat-

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[2]Corresponding author: cherie.ziemer@ars.usda.gov

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Table 1. Waste management technologies used in swine production systems

System[1]	Functional classification	Usage,[2] %
Below-ground (deep pit) slurry storage	Storage of wastes	57.2
Solids separator	Physical treatment of wastes by removing solid fraction of slurried or semisolid wastes from liquid fraction	14.6
Single nonaerated lagoon	Storage and biological treatment of slurried or liquid wastes	22.8
Multistage nonaerated lagoon system	Storage and serial biological treatment of slurried or liquid wastes	38.6
Aerated lagoon	Storage and biological treatment of slurried or liquid wastes	0.4
Composting (including vermiculture)	Biological treatment of solid or semisolid fraction of wastes	6.7
Surface spreading or spray-field irrigation	Disposal of treated solid wastes	61
	Disposal of treated semisolid wastes (surface spreading)	49.1
	Disposal of treated liquid wastes (spray-field irrigation)	11.2
Subsurface soil injection	Disposal of treated slurried wastes	34.3

[1]Usage not reported for the following types of waste-handling systems: 1) confinement building under slat-scrape, gravity-drainage, or flush system (removal of semisolid, liquid, or slurried wastes from animal environment); 2) surface or subsurface flow constructed wetlands (biological treatment of liquid wastes), or 3) anaerobic digester (biological treatment of liquid and slurried wastes; methane production for energy recovery) technologies.

[2]Estimated percentage of US swine facilities using the system (USDA, 2002). Some facilities use more than one management technology, resulting in the total percentage exceeding 100%.

ment of manure. Most treatment technologies used in swine production, however, rely on physical and biological treatment of manure to decrease nutrient and microbial concentrations before removal from the system. Table 1 provides some of the more commonly used waste management systems in swine production facilities. This review summarizes Council for Agricultural Science and Technology Special Publication No. 29, "Fate and Transport of Zoonotic Bacterial, Viral, and Parasitic Pathogens During Swine Manure Treatment, Storage, and Land Application" (Council for Agricultural Science and Technology, 2008). The Pork Check-Off commissioned this review to define the fate and transport of zoonotic pathogens after manure storage and land application to determine researchable knowledge gaps and to aid in developing research priorities related to pork production.

BACTERIAL HAZARDS ASSOCIATED WITH SWINE MANURE

Determining the environmental fate of bacterial pathogens from swine manure is extremely difficult. Biological variables include pathogen shedding by individual pigs; microbial interactions within stored manure; inoculation of stored manure each time a pig sheds pathogens; interactions with water, OM, aquatic plants, and plankton; and interactions with plants, nematodes, OM, and soil microorganisms after land application. Physical variables include type of manure storage, temperature and humidity during storage, soil type, temperature, moisture, water, pH, salinity, and rainfall events. The most studied aspect of this topic has been fecal shedding of pathogens, but understanding is still limited (USDA, 2002, 2005). Although some research indicates that pathogens in swine manure do not survive long after they are applied to the soil, other data contradict this, indicating relatively long survival times in soil and water (Table 2). There is a great need for good hypothesis-driven research to determine the factors that affect the environmental survival and persistence of zoonotic pathogens contained in swine manures.

In 1999, the US General Accounting Office reported on waste management practices used in animal agriculture (US General Accounting Office, 1999), and Hume-

Table 2. Reported bacterial zoonotic pathogens found in swine wastes[1]

	Prevalence,[2] %		Survival,[3] d		
Bacterial pathogen	Swine waste	Stored wastes	Plants	Soil	Water
Salmonella	7.9 to 100	5.2 to 22	16 to 63	16 to 120	35 to 147
Enteropathogenic *Escherichia coli*	0 to 22	15.5 to 24	16 to 63	16 to 99	90
Campylobacter	13.5 to 73.9	10.3[4]	16 to 63	8 to >32	2 to >60
Yersinia enterocolitica	0 to 65.4	0[4]	Unknown	10	6 to 448
Listeria	16 to 19.8	0 to 19	42 to 128	≤120	7 to 56

[1]Data are from Jones et al. (1976), Van Renterghem et al. (1991), Lund (1996), Guan and Holley (2003), Brandl et al. (2004), Bhaduri et al. (2005), Côté and Quessy (2005), Gütler et al. (2005), Hutchison et al. (2005a,c), Nicholson et al. (2005), Rostagno et al. (2005), USDA (2005), and Bhaduri and Wesley (2006).

[2]Prevalence = percentage of samples positive for the bacteria.

[3]Survival = length of time (in days) pathogen was detected on the soil or plant or in water. Detection of colonies of cultured organisms on agar media.

[4]Only one sample.

nik et al. (2004) summarized environmentally superior technologies in swine production facilities. Whereas many of these practices emphasized limiting nutrient loading, runoff, and other ecologically sound practices, none specifically addressed the control of zoonotic pathogens, even though the US Environmental Protection Agency (1998) cited bacteria as one of the top 3 sources of impairment in rivers and estuaries.

Zoonotic bacterial pathogens that have been associated with swine manure include *Bacillus anthracis*, *Brucella* spp., *Campylobacter* spp., *Chlamydia* spp., *Escherichia coli*, *Leptospira* spp., *Listeria monocytogenes*, *Mycobacterium* spp., *Salmonella* spp., and *Yersinia* spp. These pathogens may be transmitted either through direct contact with the manure or indirectly through the environment (Strauch and Ballarini, 1994; Pell, 1997). The most frequently studied enteric pathogens occurring in swine manure are *Salmonella*, *E. coli*, *Campylobacter*, *Listeria*, and *Enterococcus*. Lack of data on other bacterial pathogens in swine manure results from the difficulty in culturing and identifying them. Understanding the implications of the persistence of swine-associated zoonotic pathogens during storage, treatment, and land application is important for assessing and controlling their presence in the environment.

Because the epidemiology (i.e., occurrence) of fecal shedding of the most common zoonotic bacterial enteric pathogens is well described elsewhere (USDA, 2002, 2005), this review focuses on the persistence of the best characterized bacterial pathogens (i.e., *Salmonella*, *E. coli*, *Campylobacter*, *Listeria*, and *Enterococcus*) contained in stored swine manure (Jones et al., 1976; Anugwa et al., 1989; Davies et al., 1997, 1998; Chinivasagam et al., 2004; Hutchison et al., 2005a), the effects of land application (Pillai et al., 1996; Lewis and Gattie, 2002; Gerba and Smith, 2005), their survival in soil (Van Renterghem et al., 1991; de Freitas et al., 2003; Santamaría and Toranzos, 2003; Brandl et al., 2004; Hutchison et al., 2004; Côté and Quessy, 2005; Nicholson et al., 2005), the effects of runoff events (Van Donsel et al., 1967; Saini et al., 2003; Tyrrel and Quinton, 2003; Malik et al., 2004), and their presence in water (Blaser et al., 1980; Lund, 1996; Jones, 2001; Nevecherya et al., 2005). Table 2 presents a summary of data on zoonotic pathogen prevalence and survival. As this table demonstrates, studies vary widely in the reported presence and survival of zoonotic pathogens, depending on the studied growth conditions, sensitivity of culture media, and swine production system. Data supporting the prevalence in swine manure are the most abundant and come from survey types of studies (Van Renterghem et al., 1991; Guan and Holley, 2003; Bhaduri et al., 2005; Gütler et al., 2005; Hutchison et al., 2005a; Nicholson et al., 2005; USDA, 2005; Bhaduri and Wesley, 2006). There is little information on the survival of these pathogens in swine manure representing on-farm conditions, where urine and feces are being added on a continual basis, because most studies take samples away from the storage unit and hold them in laboratory conditions.

Unfortunately, survival studies of zoonotic pathogens from swine manure on plants (Herikstad et al., 2002; Dong et al., 2003; Kühn et al., 2003; Hutchison et al., 2005c), in the soil, and in water are limited. Effects of soil type, pH, and moisture content on the survival and persistence of swine manure pathogens have not been studied systematically. There is a need for good hypothesis-driven research on the prevalence and survival of swine manure pathogens beyond the typical survey work currently available in the literature. Further research is needed for land application of manure with regard to pathogens in bioaerosols; transport into soil, through soil, or both; and the potential to enter water via infiltration or runoff. Although the enteric pathogens have been the most studied to date, more research is needed on the amounts of other zoonotic pathogens in swine manure as well as on their survival and dissemination in soil and water. More information is needed on how different climate and soil factors affect the ability of these bacteria to persist in and be transported through soil and water.

COMMON VIRUSES OF SWINE

Influenza

Influenza virus is a zoonotic agent that can be transmitted easily between animals and humans (Castrucci et al., 1993; Webby and Webster, 2001). The broad host range of influenza viruses includes humans, pigs, birds, marine mammals, horses, mink (Webster, 1997), cats (Thanawongnuwech et al., 2005), and dogs (Crawford et al., 2005). Infection of humans with swine influenza virus has occurred sporadically (Dacso et al., 1984; Wells et al., 1991; Alexander and Brown, 2000), causing clinical disease of varying severity and transmissibility, but occasionally, some occurrences have been fatal. There is strong evidence that swine veterinarians, swine farmers, and meat-processing workers are at increased risk of swine influenza virus infection compared with people who have no exposure to swine (Olsen et al., 2002; Myers et al., 2006).

As enveloped viruses, influenza viruses are sensitive to heat, lipid solvents, detergents, irradiation, and oxidizing agents. The influenza viruses are considered environmentally labile outside the host (Quinn et al., 2002). The Centers for Disease Control and Prevention (2005) recommends chemical disinfection with a 1:10 dilution of household bleach or with any of several of the H Registered Antimicrobial Products for Medical Waste Treatment on the list of the US Environmental Protection Agency, including calcium oxide, sodium chloride, sodium dichloro-*s*-triazinetrione (e.g., swimming pool chlorine), glutaraldehyde, and quaternary ammonium compounds (US Environmental Protection

Agency, 2005). The effectiveness of any disinfectant can be reduced in the presence of OM that alters the pH, temperature, or both.

Hepatitis E Virus

Swine hepatitis E virus (**HEV**), a novel virus closely related genetically and antigenically to human HEV, was discovered and characterized by Meng et al. (1997). Pigs experimentally and naturally infected by swine HEV remain clinically normal but develop microscopic lesions; in the United States, approximately 60 to 100% of pigs are infected (Meng et al., 1997). Cases of acute hepatitis E also have occurred in patients from industrialized countries, including the United States (Hsieh et al., 1999; van der Poel et al., 2001; Takahashi et al., 2003; Yazaki et al., 2003). The main route of transmission for HEV is believed to be fecal-oral. Cross-species infections of human and swine HEV have been documented (Meng et al., 1998a,b; Halbur et al., 2001).

It has been demonstrated that infected pigs shed large amounts of viruses in feces (Meng et al., 1998b; Halbur et al., 2001; Williams et al., 2001). Because of the ubiquitous nature of swine HEV in pigs and the large amount of viruses excreted in feces, swine manure could contaminate irrigation and drinking water in nearby wells, rivers, ponds, or coastal water (Smith et al., 2001). Swine HEV has been detected in swine manure and wastewater associated with hog operations (Karetnyi et al., 1999) and in concrete pits and earthen lagoons of swine manure storage facilities (Kasorndorkbua et al., 2005). Unfortunately, it is not known how long the virus can survive in swine manure and remain infectious or what effect the manure storage and treatment will have on the infectivity of HEV. Future research is warranted to assess the survivability of HEV in swine manure and in different environmental regimens.

Enteric Calciviruses (Noroviruses and Sapoviruses)

Caliciviruses include *Norovirus* (**NoV**), *Sapovirus* (**SaV**), *Vesivirus*, and *Lagovirus*. Viruses in the NoV and SaV genera cause diarrhea in humans and animals and are referred to as human or animal enteric caliciviruses (Green et al., 2001). The identification of closely related animal enteric caliciviruses in pigs and the existence of recombinants within human and porcine strains (Jiang et al., 1999; Katayama et al., 2002, 2004) raise concerns regarding possible transmission between animals and humans.

Wang et al. (2004) reported that porcine NoV (**PoNoV**) were detected only in fecal samples collected from finisher pigs, but not from those collected from nursing pigs, postweaning pigs, or sows. Most positive samples in this study were from healthy animals, indicating that, as previously observed for human NoV infections (Rockx et al., 2002), asymptomatic shedding of PoNoV occurs in adults, contributing to virus persistence in the field. *Sapovirus* in humans primarily has been associated with acute gastroenteritis in young children (Chiba et al., 2000). The porcine SaV has emerged as an important pathogen associated with diarrhea and subclinical infections among pigs of all ages (Wang et al., 2006; Jeong et al., 2007; Martella et al., 2008). Enteric viruses are acid stable and can survive in the gastrointestinal tract. Most viruses remain infectious after refrigeration and freezing and also retain their infectivity after heating to 60°C for 30 min. Chlorine-based disinfectants are considered the most effective against enteric viruses.

After application of contaminated manure to land, the potential for environmental contamination may exist, including possible spread to other areas resulting from increased rainfall, overflow, or aerosol (Tyrrel and Quinton, 2003). Although the virus concentration will be less in water, the low infectious dose of human NoV (as few as 10 to 100 particles; Moe et al., 1999) and its ability to survive increase the risk of outbreak when contaminated water sources are used in food processing or as public water supplies (Hoebe et al., 2004; Ueki et al., 2004). For animal enteric caliciviruses, the first study to investigate the effect of environmental technologies on the fate of these pathogens in animal manure under field conditions was performed recently (Costantini et al., 2007). These authors evaluated 5 different environmental technologies and a conventional swine operation where storage and treatment of manure was in wastewater lagoons (Table 3). The porcine SaV and PoNoV were detected in fresh feces before treatment, but neither virus type was detected after any treatment.

Rotavirus

Rotaviruses (**RV**) are the leading cause of acute viral gastroenteritis in the young of both avian and mammalian species, including pigs and humans (Saif et al., 1994; Yuan et al., 2006). The RV from group A are the main agents of viral diarrhea in piglets, accounting for 53% of preweaning and 44% of postweaning diarrhea in swine (Fitzgerald et al., 1988; Saif et al., 1994; Yuan et al., 2006); non-group A can be detected within the same herd (Janke et al., 1990; Geyer et al., 1995; Kim et al., 1999). The presence of RV in livestock is a potential public health problem whose significance is increased by the detection in humans of serotypes and genotypes of animal strains and vice versa. Human strains also have been detected in pigs (Racz et al., 2000; Martella et al., 2001; Palombo, 2002). Moreover, in the last 3 yr, evidence has been reported for the presence of 3 different porcine strains circulating in humans (Laird et al., 2003; Esona et al., 2004; Varghese et al., 2004).