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PERIODICALS
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SCIENCE AND NEWS FROM THE INTERNATIONAL ASSOCIATION FOR FOOD PROTECTION

SEPTEMBER 2004

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VOLUME 23, NO. 9

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"A VIEW FROM WISCONSIN"

By **KATHLEEN A. GLASS**
PRESIDENT

"I anticipate an exciting and productive year ahead."

Although I am writing this column two weeks in advance of the 2004 International Association for Food Protection Annual Conference in Phoenix, Arizona, I am confident that this year's meeting has once again demonstrated that IAFP is a world-class food safety organization. I feel secure making this prediction based on early registration numbers being on pace for a record-setting attendance, the number of reserved exhibits reaching maximum capacity for our allotted space, an educational program which is packed with quality presentations covering a wide-variety of food protection issues, and a list of special speakers that reads like a "Who's Who of Food Safety Professionals." The organized social functions, the opportunities to gather with old friends and make new ones, and the location of the conference in a 5-Star JW Marriott Resort are bonuses. What more can you ask? (Ok, temperatures less than 100°F might be nice; but, considering the quality of the program, who has time to go outside anyway?)

Ralph Waldo Emerson said that *"Nothing great was ever achieved without enthusiasm."* Our successful annual conference is clearly a reflection of the enthusiasm and contributions of our staff and many volunteer members.

First of all, the talented IAFP Staff, led by our Executive Director David Tharp and Assistant Director Lisa Hovey, skillfully negotiate for the best possible meeting site, and work with great attention to detail to ensure the program and other functions are well organized and promoted. Certainly, our educational program and special speakers are integral to the success of our conference. The Program Committee, chaired in 2004 by Gary Acuff, has the unenviable task of determining which of the many worthy submitted symposia, workshops, and technical abstracts will be given a coveted slot in a packed agenda. The Committee's responsibility is to ensure that the program is not only of the highest quality, but is well-balanced so that every attendee will find valuable programming that addresses his or her needs during each session of the day. While the Program Committee acts as referee, the essence of the program depends on our active IAFP volunteers. Many of our Professional Development Groups, as well as individuals and their colleagues, brainstorm and collaborate to develop proposals for symposia that discuss current food protection issues and solutions. In addition, students and research staff from universities, government research agencies, and the private sector present their scientific findings via poster and oral technical sessions to fill out the program.

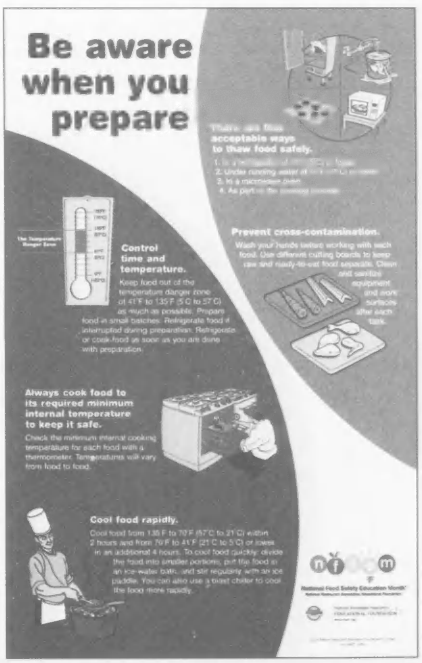
The collective responsibility of the Executive Board is "to look at the big picture." If we recognize omissions in the program, we suggest "filling in holes" but rely on a host of gifted, enthusiastic members for the ultimate success of the meeting. The charge of the Executive Board is not to micro-manage but to oversee that our volunteers and staff work in partnership and stay focused on the mission of our Association, which is "to provide food safety professionals worldwide with a forum to exchange information on protecting the food supply."

Undoubtedly, both our successful annual meeting and our journals are vital to our mission. However, we realize that we must also meet our members' needs through a variety of other avenues. In last month's President's Perspective column, Paul Hall briefly described the April 2004 planning session

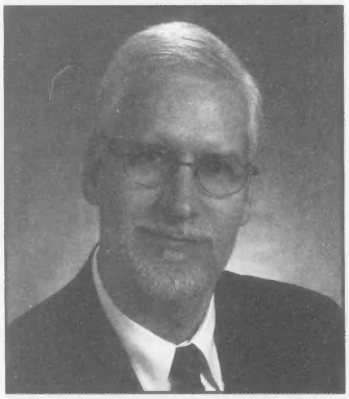
during which the IAFP Executive Board and Staff reviewed our Mission and defined specific elements in which we need to advance. This exercise examined the evolution of our Association during the past century and further identified five prominent opportunities to meet our members' needs for the future including: (1) Outreach and Education, (2) Publications, (3) Foundation Fund, (4) Affiliates, and (5) International Issues. During the upcoming months, the Board will work toward fine-tuning goals for each component and identify practical means by which we can attain the goals by 2010. As we move forward, I will update you on our progress.

I anticipate an exciting and productive year ahead. In addition to our Past-President Paul Hall, I will have the privilege to serve with President-Elect Jeff Farber, Vice President Frank Yiannis, Secretary Gary Acuff and Affiliate Council Chairperson Stephanie Olmstead. These individuals are committed to promoting the mission of our organization and will focus on developing a plan to take IAFP through our journey into the future.

Lastly, I want to thank Steve Murphy, who has completed his one-year term representing the Affiliate Council on the Board. We will miss Steve's thoughtfulness and humor in our meetings and E-mail discussions. I also want to recognize two special colleagues and friends: Anna Lammerding, as she leaves her tenure on the IAFP Executive Board, and Past President Paul Hall, who will continue to provide a strong perspective during the next year. Their service, enthusiasm, and dedication, as well as those of our many other previous presidents and leaders, have left a positive impact on our Association. I am truly honored to follow in their footsteps and to be able to serve the IAFP membership for the next year as President of your Association. I welcome your ideas and look forward to working with you. Please feel free to E-mail me at kglass@wisc.edu and let me know your view.



"COMMENTARY"
FROM THE EXECUTIVE DIRECTOR



By DAVID W. THARP, CAE
EXECUTIVE DIRECTOR

"If IAFP recorded presentations, would you be interested?"

It was the best Annual Meeting ever! IAFP 2004 exceeded all predictions! It was a great Annual Meeting! On the other hand, was it really? One of the challenges of writing a monthly column in a print publication is that you have to work so far in advance.

As Kathy Glass, our new President, indicated in her column, we must write our columns about five or six weeks in advance of the publication date. Therefore, when you read this column, the Annual Meeting will be history, over with, completed, all done, etc. Of course, at that time (present time for those of you reading this!), most all of the statistics from IAFP 2004 will be known. As of right now (my present time), all of our indicators show that IAFP 2004 will not only break previous records, but also IAFP 2004 will shatter those benchmarks!

As of August 1, our Exhibit Hall is filled to capacity (128 booths) as it has been for the past three weeks. We have been able to accommodate late requests for exhibit booths because of cancellations of other exhibitors; otherwise, we would have had to turn some exhibitors away this year. Last year, our Exhibit Hall held 107 booths, which means we had a 20% increase in exhibitors over IAFP 2003. Sponsorship monies followed the same trend and increased by 20% over last year.

Attendance should also show a healthy increase when comparing IAFP 2004 to IAFP 2003. For 2003, we had 1,481 attendees. Again, if I may take you to my "present time" preceding IAFP 2004's beginning, we have met last year's total attendance in our pre-registered attendees. Normally, we have between 100 and 150 attendees register on-site at the meeting so we should have no challenge in exceeding 1,500 attendees at IAFP 2004. That would indicate we should see between a 6% and 10% increase in attendance at IAFP 2004 when comparing to IAFP 2003! I have said it before, but it is worth repeating, "these are wonderful problems to have to deal with!"

Some of IAFP's growth has caused concern for our Annual Meeting attendees in the past and I have to imagine (at my present time) that we will hear the same concerns expressed this year. The concern I am thinking of is that there are too many concurrent sessions and that it is too difficult to see everything (exhibits and posters) and hear everything (symposia and technical sessions) and the choices of what to do or where to go are bewildering. IAFP 2004 offered six concurrent sessions for attendees to choose during all session times in addition to the Exhibit Hall and poster sessions. Just 8 or 9 years ago, I recall the debate that took place when we discussed increasing from three concurrent sessions to four in some time slots.

This does bring up a question for you whether you attend Annual Meetings or if you are unable to do so. If IAFP recorded presentations at its Annual Meetings, would you be interested in purchasing CD's containing voice recordings and PowerPoint slide presentations that would be a compilation of all Annual Meeting presentations? We could also include PowerPoint presentations of each of our poster presentations for those not being able to get through all that the IAFP Annual Meeting has to offer! This is one way that we have been looking at to address the age-old issue of not being able to be in more than one place at a time. If you have an opinion on this and have a minute, send me an E-mail (dtharp@food-protection.org) to let me know your thoughts.

I am confident that with all the planning so many people initiate for IAFP Annual Meetings and with the high-caliber of speakers we have on the program this year, "IAFP 2004 will exceed all predictions!" (at least until IAFP 2005 takes place!). If you were in Phoenix for IAFP 2004, I hope that you are now able to say, "This was the best Annual Meeting ever" and I hope that you mean it!

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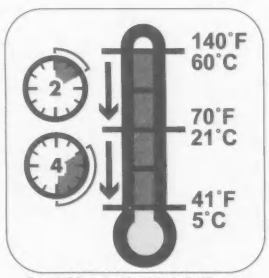

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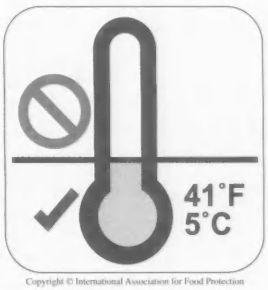

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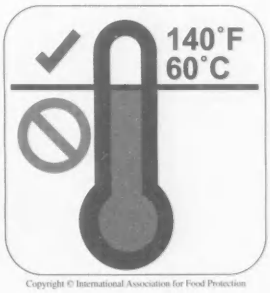

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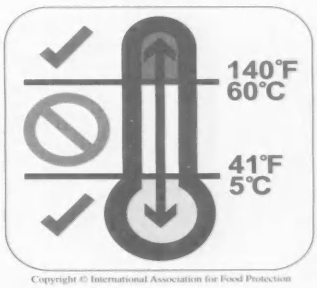

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International Association for Food Protection

Opinion Survey of Wisconsin Dairy Professionals about Milk Quality

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SUMMARY

Wisconsin dairy professionals (n = 165) were surveyed during late 2001, using a mailed questionnaire. The survey was composed of questions regarding personal work characteristics, impression of a team-based milk quality improvement program (Milk Money) and opinions about milk quality issues. The response rate was high (78.8%), and respondents comprised veterinarians (n = 42), extension agents (n = 35), dairy plant field representatives (n = 21), vocational agricultural instructors (n = 17) and others (n = 15). Responders were experienced and worked with herds that were representative of Wisconsin dairies. Most (66.7%) dairy plant field representatives spent more than 50% of their professional time working on milk quality issues, whereas the majority of other responders spent < 10% of their professional time working with this issue. Most responders (88.3%) agreed that working with other consultants is an effective way to improve milk quality. Common barriers to improvement of milk quality on farm were the existence of too many other problems (54.6%) and few incentives for production of high quality milk (47.7%). Additional on-farm training programs (23.9%) and "more time" (21.5%) were cited as resources needed for implementation of farm-based milk quality programs. All responders agreed that bulk milk somatic cell counts (BMSCC) and milk quality premiums were important for dairy farm profitability. Most (78.5%) responders agreed that the current U.S. BMSCC regulatory limit was too high. Responder groups differed in their opinions regarding critical issues for improvement in milk quality and the willingness of farmers to pay for specific milk quality services.

INTRODUCTION

The dairy industry has been influenced by consumers' increasing demands for more stringent hygiene and quality standards. Bulk milk somatic cell count (BMSCC), which is one tool used to determine raw milk quality, reflects the amount of intramammary infection and is associated with overall milk quality management. BMSCC is often used as an indicator of milk quality and has an important role in regulating quality standards. Lower BMSCC levels have been linked to higher milk yield, better dairy product quality *(6)* and reduced risk of antibiotic residues *(11)*. Because many dairy processors provide economic incentives to farmers who produce milk with low levels of SCC, reducing BMSCC can result in substantial extra milk revenues *(2)*. Many programs designed by universities (Milk Money, Dairy Diagnostic Team, PRODAIRY, Dairy Excel) are available to help dairy farmers improve milk quality. These programs usually address specific short-term needs of each farm and are independently organized by various farm advisors. An alternative method of improving milk quality is the formation of milk quality teams, the use of which has been previously described *(10, 12)*. Team members get the benefits of learning from each

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TABLE 1. Somatic cell count distribution of herds served by responders

Bulk milk SCC average per year (cells/ml)	Average number of herds per responder
< 200,000	14.1 (18.0%)
200,000–299,999	21.5 (27.2%)
300,000–399,999	23.9 (30.0%)
400,000–499,999	11.9 (15.1%)
≥ 500,000	7.6 (9.7%)

TABLE 2. Most commonly reported reasons for participating in a team-based milk quality program[1]

Have participated n = 40 (38.8% of total responders)		Have not participated n = 50 (48.5% of total responders)	
Reasons	Percentage of responses (%)	Reasons	Percentage of responses (%)
"Milk Money helps us focus on goals to improve milk quality."	33.0	"I have not had time to start a team."	29.1
"I like the concept of working with other professionals."	30.1	"I have not gotten around to it yet."	24.3
"I have farms with mastitis problems."	27.2	"The price of milk is too low."	16.5

[1] "Milk Money" program

other and of reaching consensus to create the necessary commitment to achieve goals. In a previous study, the formation of milk quality teams was an important mechanism for encouraging adoption of many management practices that lowered BMSCC and resulted in increased milk quality premiums *(10)*.

Dairy producers have acknowledged the benefits of working with dairy professionals. Wisconsin farmers enrolled in improvement programs emphasized the importance of individual goal setting and face-to-face contact with their consultants *(8)*. Producers from the central region of Canada believed that joining programs brings them more advice and service *(4)*. Furthermore, managers of Minnesota dairies who worked with a diagnostic team reported an improvement in their attitude *(12)*. Many Wisconsin dairy farms have enrolled in a milk quality program (Milk Money) that is based on involving local experts in a team-based approach to reach farm-specific milk quality goals *(10)*. This program is offered free to all Wisconsin dairy farms and has enrolled more than 260 dairy farms and numerous dairy professionals. Each participating farm is encouraged to form a milk quality team that creates and implements a farm-specific milk quality action plan. During 4 months, the milk quality team meets monthly to assess management and financial changes related to specific milk quality goals, using program materials and additional educational resources are supplied by the University of Wisconsin (awww.uwex.edu/milkquality). The objective of this study was to survey Wisconsin dairy professionals who have been involved in the team-based milk quality program, to determine their opinions about milk quality issues.

MATERIALS AND METHODS

A thirteen-page, postage-paid questionnaire was designed and sent to Wisconsin dairy professionals (n = 165) in October of 2002, using standard survey methodology *(3)*. Dairy professionals were identified from the "Milk Money" database as participants in training programs or "Milk Money" teams. Completion of the survey required 10 to 15 minutes. The questionnaire consisted of three parts: personal work characteristics, impression of "Milk Money" and opinions about milk quality issues. Most of the questions were closed-ended, but some allowed multiple responses. Responders who were not working with "Milk Money" teams were asked to reply to only the first and last part of the survey. One week later, a postcard was sent to thank those who had returned their survey and to request non-responders to reply. After three weeks, non-responders received a second copy of the questionnaire. Statistical analyses were performed using Statistix 7.0 for Windows (Analytical Software Inc., 2000).

RESULTS AND DISCUSSION

Profile of responders

The excellent survey response rate (78.8%) indicated that Wisconsin dairy professionals were interested in team-based efforts to improve milk quality. It is likely that the use of specific survey methodology *(3)* and the high interest of the agricultural professionals increased the response rate, although not all the responders answered all the questions. The responder groups consisted of veterinarians (n = 42), extension agents (n = 35), dairy plant field representatives (n = 21), vocational agricultural instructors (n = 17) and others (n = 15). Responders were experienced (64.6% reported that they had worked with dairy farms for 16 or more years), worked with moderate producing dairy herds (78.9% worked with herds producing 6,800 to 10,900 kg per cow per year) and worked with a variety of herd sizes (≤ 50 lactating cows (27.0%), 51–100 lactating cows (50.3%), 101–250 lactating cows (16.4%) and ≥ 250 lactating cows (6.3%)). Average herd size of Wisconsin dairy farms is about 65 cows *(1)*. The high proportion of professionals that worked with dairies containing 51-100

TABLE 3. Reported areas of milk quality that need improvement by responder group

Areas	Percentage of responses by responder group (%) Vet.[1]	Ext. Agent[2]	D.P.F. Representative[3]	Voc.Ag. Instructor[4]	Other[5]	*P*-Value among responders
BMSCC	90.5	77.1	95.2	88.2	73.3	0.69
SCC premium	95.2	88.6	85.7	88.2	66.7	0.21
Clinical mastitis cases	92.9[a]	65.7[b]	52.4[b]	47.1[b]	40.0[b]	< 0.001
Cow hygiene	78.6[a]	37.1[b]	52.4[b]	29.4[b]	26.7[b]	< 0.001

[1]Veterinarian, [2]Extension Agent, [3]Dairy Plant Field Representative, [4]Vocational Agricultural Instructor, [5]Other Dairy Professional.

[a,b]Within a row, values with different superscripts differ significantly.

TABLE 4. Proportion of responders selecting "very important" as reason to improve milk quality through reduced BMSCC

Reasons	Considered very important (%)[1]
Increase SCC premium	90.8
Produce safe healthful milk	83.1
Increase milk yield	77.7
Guarantee healthy cows	75.4
Meet consumer expectations	71.5
Decrease expenses	67.7
Decrease labor time	46.2
Meet processor expectations	44.6

[1]Question with multiple answers; column does not total to 100% because the number of answers for all reasons can be greater than the number of surveyed professionals.

lactating cows indicated that responders worked with herds that were typical of Wisconsin. The distribution of BMSCC reported by responders was consistent with the Wisconsin average of 335,000 cells per ml (Table 1). Responders reported that they worked with an average of 79.5 (7–275) dairy herds. The amount of time spent working specifically with milk quality varied significantly among responder groups ($P < 0.001$). The majority of veterinarians (54.8%), extension agents (74.3%), vocational agricultural instructors (64.7%) and other responders (60.0%) spent less than 10% of their time actively working with milk quality. In contrast, most dairy plant field representatives (66.7%) spent more than 50% of their work week actively working to improve milk quality.

Responders had all attended "Milk Money" training sessions and most (89.3%) indicated that they were satisfied or very satisfied with the program. In spite of this satisfaction, only 38.8% of responders had initiated a "Milk Money" team on one or more farms. A variety of reasons were expressed regarding participation in "Milk Money" teams (Table 2). Most responders (77.7%) indicated that they intended to participate in a "Milk Money" team in the future.

The majority of responders (88.3%) recognized that working with other consultants is an effective way to improve milk quality. They indicated that the three most common methods that they would use to improve milk quality in the future would be: use of "Milk Money" program (67%); other unspecified methods previously used (51.5%); and independent work with the farmer (35.9%).

Opinions about milk quality

All responder groups agreed that high BMSCC and the loss of SCC premiums were specific areas that needed improvement on their client farms (Table 3). A significantly higher proportion of veterinarians than of other responder groups believed that dirtiness of cows and excessive cases of clinical mastitis were important (Table 3). Veterinarians are usually the dairy professionals most involved in animal health issues; according to a California survey, almost all producers (94%) routinely consulted a veterinarian on animal health matters (9). In this survey, the difference in responses among responder groups showed the different emphasis of the various dairy professionals that advise farmers. Veterinarians are usually the ones who work with health concerns and they were willing to identify clinical mastitis cases and dirtiness of cows as specific areas milk-quality related in need of improvement.

Wisconsin dairy professionals were very much aware of farm profitability and consumer concerns (Table 4). The payment of quality premiums was considered to be a very effective mechanism for stimulating improvement in milk quality. Dairy professionals recognized that increased income is an important benefit of improving milk quality. Responders were also aware of consumer concern about food safety. Dairy professionals' knowledge of food safety and animal health are often communicated to dairy farmers. According to Payne et al. (1999), almost all of 406 surveyed producers (99%) believed that they were responsible for the safety of the milk leaving their farms.

TABLE 5. Opinions about the most qualified advisor regarding milk quality (BMSCC)

	Percentage of responses by responder group (%)				
Advisor	Vet.[1]	Ext. Agent[2]	D. P. F. Representative[3]	Voc. Ag. Instructor[4]	Other[5]
Vet.	78.6	34.3	47.6	23.5	13.3
Ext. Agent	0.0	14.3	0.0	0.0	0.0
D. P. F. Representative	0.0	5.7	4.8	17.6	20.0
Voc. Ag. Instructor	0.0	0.0	0.0	17.6	0.0
University Specialists	4.8	17.2	9.5	11.8	0.0
Industry Professionals	2.4	0.0	0.0	11.8	13.3
Other Farmers	0.0	0.0	0.0	0.0	0.0

[1]Veterinarian, [2]Extension Agent, [3]Dairy Plant Field Representative, [4]Vocational Agricultural Instructor, [5]Other Dairy Professional. Column totals do not equal 100% because some of the surveyed professionals of each group did not answer the question.

Responders indicated that the three top barriers to improvement of milk quality were the existence of too many other problems (54.6%), low incentives to produce high quality milk (47.7%) and low milk prices (43.1%). However, responders groups varied in their opinions regarding barriers to improvement in milk quality ($P < 0.001$). Most dairy plant field representatives (81.0%) believed that low milk prices were a significant barrier, while most vocational agriculture instructors (88.2%) felt that the existence of other problems was the primary barrier. Other problems were herd specific but would include general problems that result in lower herd performance, such as disease and reproductive problems. These results were consistent with producer concerns about the effect of low milk prices *(1)*, which reduce farmer incentives to produce high quality milk and thereby decrease farmer profitability, resulting in a cascade of other problems.

Responders were asked to indicate the Wisconsin dairy professional they considered most qualified to advise farmers regarding milk quality issues (Table 5). Although veterinarians received the highest percentage of responses by all responders, previous studies have indicated limited involvement of veterinarians in milk quality programs. A previous study indicated that only 29% of a group of Wisconsin dairy producers affirmed that they routinely consult with their veterinarians regarding milk quality *(10)*. Veterinary clinics participating in a herd health survey rated milk quality service as intermediate level of service *(4)* and more than half of veterinary responders in our study indicated that they spent less than 10% of their time actively working on milk quality. In another survey, the dairy plant field representatives were identified as a resource necessary to help producers implement quality assurance programs *(9)*. The differences of opinion regarding the best qualified advisor indicates that the concept of working together in a milk quality team has great promise.

Additional on-farm training programs (23.9%) and more time (21.5%) were most commonly selected as additional resources needed to improve milk quality. Lack of time was the most cited constraint to implementing changes during a dairy diagnostic team evaluation *(12)*. Dairy producers have accepted on-farm training programs. However a 10-year retrospective study, conducted in 13 dairy states, suggested a reduction in dairy extension programs due to decreasing numbers of extension personnel *(5)*.

A large majority of responders (77.7%) believed that producers benefited most when milk quality is improved. This was in agreement with results of post-project evaluation done by producers enrolled in dairy diagnostic teams, in which 72% of the producers mentioned an improvement in their quality of life *(12)*. Most responders (78.5%) indicated that they believed the current US BMSCC regulatory limit of 750,000 cells/ml was too high. This is likely in response to a worldwide tendency of decreasing the SCC regulatory limit. The Europe, New Zealand and Australia require that milk sold in their territories have SCC levels not higher than 400,000 cells/ml, and the Canadian regulatory limit is 500,000 cells/ml *(7)*. Our responders believed that the amount of both clinical and subclinical mastitis was important to the profitability of client farms, but 33.9% of responders believed that the amount of subclinical mastitis was more important.

When responders were asked to predict the most important milk quality issue in 10 years, all responder groups agreed that consumer concern about food safety would be the most important issue. Similar importance of food safety was found in a dairy focus group that listed issues for a quality assurance program *(9)*. In that survey, additional important future issues included the price of milk (11.5%) and somatic cell count levels (10.8%).

Most responders believed that farmers were willing to pay consultants to check the milking system, but there were significant differences in responses among responder categories (Table 6). More veterinarians (66.7%) than extension agents (25.7%) believed that farmers were willing to pay to review SCC and mastitis records. More veterinarians (69.1%) than

TABLE 6. Willingness of farmers to pay consultants for milk quality services

Task	General percentage of responses (%)[1] Yes	No	*P*-Value among responders
To train milkers	47.7	50.0	0.350
To review SCC and mastitis records	45.4	52.3	0.005[a]
To check milking system	87.7	10.8	0.660
To treat cows with mastitis	47.7	50.8	0.005[b]
To observe milking routine	54.6	41.5	0.021[c]
To prepare treatment protocols	68.5	29.2	0.190
To consult about milk quality	56.2	41.5	0.967
To attend team meeting	52.3	46.2	0.797

[1] Percentages of all answers in lines do not add to 100% because some of the surveyed professionals did not answer the question.

[a]Higher percentage of veterinarians than of extension agents responding/Yes.

[b]Higher percentage of veterinarians than of vocational agricultural instructors responding/Yes.

[c]Higher percentage of veterinarians than of other responders responding/Yes.

vocational agricultural instructors (17.7%) indicated that farmers were willing to pay consultants to treat cows with mastitis. A much higher proportion of veterinarians (73.8%) than of other respondents indicated that farmers were willing to pay consultants to observe milking routine.

Responder category was significantly associated with the hourly rate that responders believed farmers would pay professionals for milk quality tasks ($P < 0.001$). Over one-third of dairy plant field representatives (38.1%) believed that farmers were willing to pay less than $10.00 per hour, and around half of the extension agents (48.6%) and vocational agricultural instructors (58.8%) believed that farmers were willing to pay from $11.00 to $25.00 per hour, and most veterinarians (59.5%) believed that farmers were willing to pay over $60.00 per hour for these services. The amounts stated by the responder groups represent rough estimates of their perception of how farmers value the tasks rather than their opinions about how much consultants should be paid.

In general, veterinarians were more optimistic than others that farmers were willing to pay consultants to work with milk quality issues. A previous study indicated that farmers are receptive to advice about milk quality. An evaluation of a dairy quality program indicated that 83% of the participants would participate in the project again if it were offered, and 69% of them also stated that they would be willing to pay to participate *(12)*.

CONCLUSION

This survey was a helpful tool in determining the opinions of Wisconsin dairy professionals regarding milk quality issues. Understanding the beliefs of dairy professionals is important in designing and improving milk quality programs. The growth of the "Milk Money" program indicates that Wisconsin agricultural professionals are interested in participating in a program that focuses on team formation and specific goal setting. Almost all responders in this survey agreed that working with other consultants is an effective way to improve milk quality. However, nearly half of them had not participated because of barriers such as limited time and low milk price. Additionally, responders implied that programs to improve milk quality compete with other farms management issues. According to responders, improvement in milk quality is also limited by a lack of on-farm training and time.

As milk quality standards become more restrictive, dairy professionals need to identify methods that efficiently help them improve milk quality. The use of team-based programs focused on milk quality is considered an effective mechanism for continued improvement in milk quality. Wisconsin dairy professionals differed in their opinions about the importance of specific milk quality problems, and the team program is a mechanism for discussing those differences.

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Evaluating Food Safety Needs in the Food Industry Using a "Worker-experience Protocol"

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SUMMARY

Company food safety needs must be evaluated in order to implement successful food safety training. Customizing a program to address unique situations and needs in the food industry requires studying day-to-day food safety operations and worker food safety behaviors. One problem with most inspection methods is that they alter the behaviors being studied. To develop a less obtrusive approach, we examined the usefulness of an observation method called the Worker-Experience Protocol (WEP) in conducting a needs assessment in a food production setting. The objectives of this paper are to (1) outline the steps in the WEP, in which a person unconnected to either the regulatory system or the food company served as a 'worker' in order to make *direct observations* of company operations and worker behaviors; (2) compare the findings from this observation protocol with those of focus groups conducted with workers at the same companies; and (3) outline the unique insights that WEP provides for food safety needs assessment. Both methods highlighted current strengths and weaknesses that are reported under the following major themes: Implementing proper food safety practices; adequate plant/farm sanitation; worker food safety behavior; and communication channels. Whereas the WEP identified the physical situation and personal behaviors and interactions that might contribute to problems, the focus groups illuminated the workers' attitudes and commitment and reasons why problems occur. Although both methods provide valuable information for designing food safety programs, the WEP offers a fast, inexpensive method of gaining a well-rounded impression of worker and management actions and interactions related to food safety at a given time or at repeated time points. WEP also avoids the short-term behavior modification that often occurs during an audit or plant inspection. Food professionals could use this protocol to obtain valuable information regarding food safety needs in their operations.

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INTRODUCTION

Food safety training of workers is increasingly important because the complex food handling and processing of today's more convenient foods make management of food hazards more difficult. Foodborne diseases still cause nearly 76 million illnesses, 325,000 hospitalizations and 5,000 deaths a year in the United States *(15)*. Although health experts believe that much foodborne illness is due to mishandling by consumers, some foodborne outbreaks have been traced back to company practices. Such outbreaks can be extremely costly. For instance, a *Listeria monocytogenes* outbreak traced to poor sanitation practices at Bil Mar Foods, a Sara Lee subsidiary, resulted in approximately 100 illnesses and 21 deaths across 22 states between August 1998 and February 1999. In addition to paying a fine, Sara Lee Corporation paid individual settlements as high as $50,000 per person to victims who had become ill after consuming hot dogs from this plant *(8, 19)*. Now, proactive companies are demanding that suppliers meet certain food safety standards for both their workforce and their products. Suppliers are turning to outside consultants to assess the situation in their companies and to design an appropriate remediation program, which usually includes worker education and training.

However, such training has to be customized to the specific commodity and food establishment in order to be successful. Even though the key to safe commodities is keeping the product away from any physical, chemical or microbiological hazard *(22)*, accomplishing this will depend on the physical layout of the plant, the relationships between management and employees, the commitment to implementing and enforcing safe practices, and the resources available as well as the specific food safety training. To implement a customized and ultimately successful food safety-training program, a company's situation and needs must be carefully evaluated. An outside consultant can discover specific issues and patterns that could be overlooked by a company food safety officer, who may be inured to day-to-day operations, and then make recommendations for an appropriate food safety-training program. The outside consultant must consider the needs assessment methods available plus their strengths and weaknesses.

The consultant can evaluate company practices by conducting a formal audit, a survey using print questionnaires, individual interviews or focus groups. However, the 'punitive' atmosphere associated with audits can inspire atypical compliant behavior and obscure the real food safety problems. Surveys or interviews often obtain self-reported information based on responses more often driven by social acceptablility than by accuracy. Focus groups can identify problems perceived by the participants but are time consuming to conduct and analyze. An often overlooked method of gathering data on a situation is observation.

The objective of 'observation' in social science is to record realistic information about a situation *(18)* in an unobtrusive manner (in direct contrast to an audit). Direct observation has been used widely to collect data on human and animal behaviors in education, psychology, anthropology and the behavioral sciences *(6, 11)*. Many studies of consumer food safety behavior are available, but most rely on self-reported data *(2, 3, 4, 7, 10, 16, 21, 24, 25)*. Recently, observational studies have been used to assess consumer food safety behaviors *(9, 12, 20, 26)*, revealing that consumers often slip into risky food practices in familiar situations. In a recent review of the extensive consumer literature, Redmond and Griffith *(17)* suggest that observations could provide more accurate assessments of actual food safety practices of consumers than the more commonly used self-report instruments. In contrast, far fewer studies of the food safety behaviors of workplace food handlers are available *(1, 5, 23)* and most of these rely on self-reported behaviors. This indicates two things: first, a need to study the day-to-day food safety operations and worker food safety behaviors in the food production and processing industry, and second, a need to develop and examine the usefulness of an 'observation method' in conducting a needs assessment in a food production setting to plan a food safety training program.

To address this gap in methodology, we developed a 'Worker-Experience Protocol', in which a person unconnected to either the regulatory system or the food company, served as a 'worker' as a means of making *direct observations* of company operations and worker behaviors. We postulated that this protocol would provide valuable and unique information that would be useful in designing a food safety program. We used this protocol in a case study of several food production and processing units handling the same commodity.

The objectives of this paper are to outline the steps in the Worker-Experience Protocol; compare the findings from this observation protocol with those of focus groups conducted at the same companies; and outline the unique findings that this protocol provides for food safety needs assessment.

METHODS

Seven companies and their subsidiaries (N = 12) volunteered to participate in a needs assessment to develop a food safety-training program for members of their commodity group. Among these seven companies, five had both growing farms and packing facilities while two had only growing farms.

A total of seven focus groups, or one per company, were conducted, four with male workers and three with female workers, according to Krueger *(14)*. To avoid gender dominance, men and women were placed in separate focus groups. A random drawing of company names was used to determine the sex to recruit for the focus group at each company. Participants were recruited within each company through a combination of worker's availability and interest, and presence at working station, using personalized invitations to insure representation of all company workstations occupied by workers of that sex. Focus group participants (N=45) were Mexican Hispanics, with a mean age of 31.9 years. Most (70%) had 9 years or less of education and 55.5% were male. One moderator conducted all seven focus groups, during work hours, using a script of open-ended questions with probes that explored, among other things, workers' perceptions of the importance and practice of food safety rules within the company, worksite food safety norms and role models, availability of food safety materials (cleaning supplies, gloves, etc.), facilities (restrooms) and cues (such as posters) and the general working environment in the company. Participants received a phone calling card in appreciation for participating. All focus groups were tape-recorded, transcribed and analyzed, using qualitative thematic analysis. The Pennsylvania State University Office of Research Protections approved all procedures used in this research work.

The Worker-Experience Protocol (WEP) observations were recorded by use of an anecdotal records procedure *(13)* in which the observer records 'incidents' using a pocket notepad during a defined observation period. This is a semi-struc-

tured procedure in which observers use a list of possible areas or issues, e.g., use of gloves, hairnets, workstation cleanliness, to guide their observations. After the observation period, the details surrounding each incident were recorded. At the end of the day of observations, all these incidents were summarized into categories. This method was chosen after reviewing the literature about observational procedures and data collection because it is simple and allows the observer to focus on what is happening at the workstations in the company.

One researcher conducted the WEP at all companies using the following steps.

Training the observer. Prior to visiting any company, the observer became familiar with published observational procedures and methods for collecting data and practiced the recording procedure in locations having levels of activities and noise similar to those that might exist in the companies. In addition, the observer reviewed literature from companies producing the commodity to learn how the commodity is generally handled and the usual harvesting and processing flow or steps. Finally, the observer developed a plan of how to approach the workers and explain his or her presence at their workstations and practiced this approach. The observer must always use the same approach and explanations to avoid employee behavior modifications.

Company orientation. Prior to visiting, the facilities, the observer presented a detailed explanation of the observation protocol and its purpose to the management at each participating company. The observer answered all questions and provided assurances of the confidentiality of the process to build management trust in the protocol.

Observer orientation to each worksite. Upon arrival at each company, the person in charge (e.g., manager, director, owner) gave the observer a 30-minute tour of the company's facilities and introduced the observer to key personnel (foremen, supervisors, production line leaders, or group leaders) at the harvesting site or on the production floor. The observer was introduced to these company personnel as a person interested in the commodity who was 'researching' their facility, and the employees were asked to help the observer out during his stay at the company. When workers specifically asked the observer why he was there, he always provided the same story, that he was experiencing the work environment to develop employee-training materials for the industry. This tour is a key step in the WEP because it is the first contact with the company's employees and facilities. In addition, it provides an overview of the facility layout and operational procedures that will be used in the next step to decide how the observations will take place over the day.

Identifying workstations, observation sites and sequence. After the tour, the observer defined the operational steps and identified the workstations or harvesting sites within each step in which he would work and record observations. In companies that had only farm facilities (rather than both packing and farm facilities), the number of crews was identified and equal-time intervals were allocated to observe them. The sequence of observation sites and the key items to observe were outlined.

Observation. All the companies gave complete freedom of access to the observer, who conducted two days of observations at the companies with both a packing facility and farms or one day at the companies that only grew the commodity. The observer worked 1–3 hours at each company workstation. At the farms, the observer assisted with harvesting and worked with some of the crews performing various tasks critical to crop rotation and maintenance. In the packing facility, the observer washed, packed, and stored the commodity and performed cleanup duties. During the breaks, the observer recorded notes on his pocket notepad about relevant observed food safety issues. There was no specific order of visiting workstations and the period of time at each workstation could vary depending on the information that was being collected. The observer approached the workers as the daily activities in the company allowed, introducing himself as an observer learning how to improve handling of this commodity for the company and exchanged small talk to increase comfort with his presence. Although the observer was as unobtrusive as possible, sometimes the workers initiated conversation with the observer and provided valuable information that enriched the data analysis.

Data analysis. The notes recorded during each site or workstation observation period formed the data, which included observations of specific individuals, social events or interactions as well as details about food safety-related activities and practices. These notes were examined for themes across similar workstations at each company. Then the themes were summarized across the companies and a final report was written assessing the situation for all participating companies.

RESULTS

The findings from WEP and focus groups are reported under major themes.

Implementing proper food safety practices varies across companies

The key items examined included management and worker commitment, extent of worker training, and sufficiency of resources (washroom facilities, adequate supplies, etc.).

WEP Observations: Comments from top managers prior to the observations indicated their commitment to having an effective food safety program. From worker comments, it appeared that some companies provided some formal training in food safety practices while others did not. Some companies had rules posted on a bulletin board. Most companies had adequate cleaning and sanitizing supplies, and workers were instructed to inform their supervisor if items needed replenishment. However, the size and cleanliness of restrooms, the availability of towels and soap and, on the farms, the availability of hand washing facilities to workers varied. In some companies, workers appeared disinclined to inform management when towels and soap were depleted. Conduct rules for restroom breaks were not evident and, in some cases, hand washing could not be observed, as the station was not outside the restroom. At the farms, appropriate restrooms were often not available.

Focus Groups: Participants indicated that food safety training ranged from a formal lecture or video provided once a year to only receiving a printed sheet of food safety rules on the day they were hired. Workers felt that few managers were role models for appropriate food safety behavior and that, in some cases, worker suggestions or requests for supplies were ignored. Workers could list the food safety rules and knew they should be followed if they wanted to retain their jobs but did not understand why following the rules was important. Although packing participants reported that restrooms were cleaned regularly, participants felt that thoroughness varied depending on production goals.

Adequate plant/farm sanitation

The key items examined were cleaning of workstations, equipment, floors and holding bins at appropriate time intervals, and controlling insect infestation.

WEP Observations: In some companies, it was difficult to keep the holding bins used to transport the commodity from farm to packing plant clean. In others, a cleaning protocol for these bins had been established and was followed. Packing plant sanitation was usually done at night when packing lines were down. In many companies, beginning and ending times for operations were fluid and cleaning schedules were disrupted. Only a few packing plants had additional cleaning times scheduled during the day and when it was not done more often, the cleanliness of some equipment and floors became problematic. Floors could become covered with standing water and wood surfaces saturated, which could promote bacterial growth. No insects were observed in the packing plants except for flies on the loading docks. At the farms, cleaning protocols for the facilities were generally not practical, except for the restrooms. However, the bins holding the harvested commodity for shipment to the packing house were a key control point and were kept very clean in some, but not all companies.

Focus Groups: Participants knew the holding bins should be kept clean and that cleaning the plant was important but they did not know why these procedures were important. They also felt that harvesting and packing (output) were top priority during the day and that cleanliness of workstations was low priority. On the farms, harvesting productivity and sanitation aimed at keeping the growing areas free of disease organisms that would decrease commodity output were more important than practices that would protect the ultimate consumer.

Worker food safety behavior

Key items examined were workers' practices and supervisors' enforcement of good personal hygiene and of good manufacturing practices when handling the commodity as well as the status of break/lunch areas.

WEP Observation: Personal hygiene was a problem for some workers, especially those working at the farms. Only one farm required that farm workers wear jumpsuits over their regular clothes when handling the commodity. Certain groups of workers in the packing facility were required to wear smocks, but the cleanliness of these smocks varied. The routine for changing and cleaning smocks or jumpsuits was obvious in some companies but not in others. Although most workers in packing facilities wore hairnets and gloves, many did not wear the hairnets correctly. Hairnets and gloves were not evident at most farms. Appropriate use of jewelry and nail polish was a problem in most packing facilities. Inappropriate consumption of snacks or candy while working was a major problem at both farm and packing units. Facilities for breaks and lunch varied in quality and cleanliness across the companies. Some had very clean lunch/break rooms, with clean equipment such as microwave ovens, while others were rather dirty. In some companies, personal hygiene rules were enforced and correct behavior noted verbally by supervisors. In others, these rules were not enforced and supervisors did not seem to be aware of infractions or sometimes chose to ignore them.

Focus Groups: Participants recognized that some workers exhibited poor personal hygiene but many felt this was a personal matter and not something that company personnel could rectify. They reported that responsibility for cleaning smocks and jumpsuits varied across worksites. Both packers and farm workers indicated that wearing gloves was no problem. However, some did not like hairnets and women were conscious of how these detracted from their appearance. Both male and female workers liked wearing jewelry, especially rings and necklaces, and resented rules that limited this self-expression. Women also resented restricting use of nail polish. Many felt they should be allowed to chew gum or have snacks to eat at their workstations. Some noted that supervisors also chewed gum or had snacks. Participants felt that enforcement of rules was subjective and unfair so that all suffered because of a few bad apples. Some felt that supervisors had favorites who could get away with infractions that would be punishable for others. Others felt that their good behavior went unnoticed by both the middle and top management.

Communication channels

Key items examined were presence of communication channels, direction of communication, and communication incidents involving enforcement of rules.

WEP Observations: Language was a barrier between the English-speaking management and the non-English-speaking workers. Although some companies relied on ethnically identical supervisors who could also speak English, many did not have a management member or supervisor who spoke the workers' language. Workers were more likely to converse with supervisors who spoke their language than those who could not. Communication with management or supervisors might be channeled through a fellow worker who used broken English, and reception by the superior could vary from reasonable understanding to misunderstanding. More often, workers would turn to one another to learn how to do something or find something. Few signs or posters in the workers' native languages were evident on inspection of company facilities. What posters were present were out-dated, poorly translated and not directly relevant to the production and packing of this commodity. Most posters seemed to be ignored by the workers.

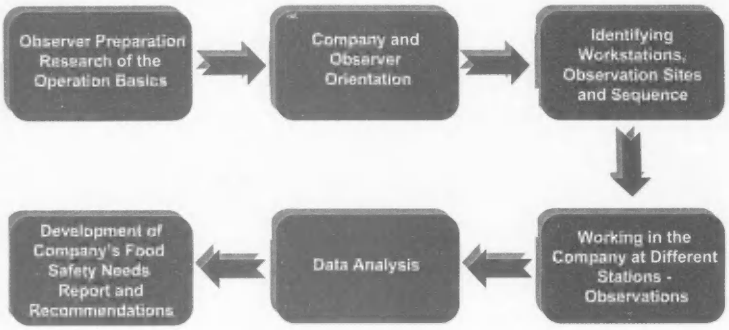
Focus Groups: In most companies, participants made it clear that communication was top down and that worker suggestions or concerns were often ignored. The lack of communication between the workers and the top management was not all attributed to language differences. Some workers felt that they got no recognition for following the rules and that enforcement by the middle management was inconsistent. Others reported excessive enforcement of rules through punitive bookkeeping systems. Women participants were especially resentful of the lack of courtesy exhibited by some middle managers in enforcing rules. Some reported that management had promised workers certain rewards (e.g., jackets) that were not delivered, or had offered rewards that were considered silly (e.g., key chains). Some participants felt that the posters were not relevant to them, and many ignored those posted for some time.

DISCUSSION AND CONCLUSIONS

The Worker-Experience Protocol clearly allowed the observer to identify both strengths and weaknesses in the food safety environment of each company. The factors evaluated included:

- the physical facilities, their cleanliness and the resources devoted to food safety practices;
- the cleaning and sanitizing protocols used and their degree of efficiency;
- critical control points or situations to consider for preventive action;

FIGURE 1. Implementation steps of the Worker-Experience Protocol



- the range of worker behavior with regard to food safety protocols;
- the degree of interaction between workers and management; and
- the extent of reinforcement of appropriate behavior by supervisors and visual aids.

The WEP clearly illuminated problems across companies and offers the following unique features:

- It pinpoints the specific steps, sites and personnel to be involved in solving a problem, thus providing a framework for practical solutions to the problem;
- It records actual behaviors, with little of the behavior modification that might occur in a more formal audit. The recorded behaviors can be used as real life examples in subsequent food safety training;
- It identifies specific operations in which poor communication might contribute to problems, which helps identify the personnel to involve in correcting the problems;
- It highlights good practices in operations common to this commodity so that corrections suggested have relevance; and
- It provides an overview of the 24-hour operation and highlights dovetailing or lack thereof of food safety procedures, something overlooked in less complete evaluations of company procedures.

In contrast, the focus groups enabled the moderator to examine some of the reasons for the weaknesses or strengths observed, in particular

- The training provided the workers and how this affected their behaviors;
- The degree of worker commitment to food safety practices;
- The extent of role models among management and workers;
- How communication 'worked' from the workers' viewpoints; and
- Worker feelings about personal hygiene, its relevance to food safety and why infractions might occur.

The focus groups were critical to explaining how

- Sufficiency of food safety training affected beliefs about performing food safety behaviors, especially in understanding why certain things must be done;
- Lack of management role models negatively affects worker behaviors;
- Poor communication as well as the manner of communication can affect worker moral and willingness to follow through; their design also highlighted male and female differences in expectations about communication and motivation; and
- Beliefs about personal hygiene, feelings about personal appearance and access to breaks, snacks, and appropriate facilities (lunch room and restroom) can affect behaviors.

An effective food safety program requires sufficient resources, appropriate facilities, relevant training, good communication channels, and motivated workers and management. We feel that both the WEP and focus groups make unique contributions to an assessment of the food safety needs of a company or group of companies. Thus, we would not recommend relying on just one of these methods when gathering baseline data for a needs assessment. Instead, we recommend using both to provide a more complete picture of a company environment.

However, the WEP does offer some unique advantages for monitoring and evaluating the implementation of a food safety program. These include:

- Offering a fast, inexpensive method to gain a well-rounded impression of worker and management actions and interactions around food safety at one time point or repeated time points;
- Permitting an outsider with 'new' eyes to evaluate an operation and provide a fresh perspective on operations;
- Allowing periodic examination of company operations so that emerging food safety problems can be addressed; and
- Allowing periodic examination of behavioral outcomes of any food safety training so that problems that persist can be corrected.

We feel that others would find the WEP useful and could extend its usefulness through further testing.* Figure 1 shows a step-by-step outline of implementation of the WEP. The data generated by the WEP is also valuable for designing food safety education materials and for planning food safety programs within the food industry. Cost of the WEP will depend on company size. A well-trained observer could complete this in 1–2 days. A focus group with setup and data analysis would require an additional half-day. Total cost would depend on hourly pay for the observer. These costs should be worth the information gained.

*Contact the first author for references on the use of observations.

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Microbiological Evaluation of Food Contact Surfaces in Iowa Schools

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SUMMARY

A study of 40 school foodservice operations assessed the effectiveness of cleaning and sanitation of five food contact surfaces, including work tables/counters; cooking equipment such as mixing bowls or steam-jacketed kettles; and serving trays and equipment surfaces that could cross-contaminate food, such as refrigerator or freezer handles and handwashing sink handles. Aerobic plate count (APC), *Enterobacteriaceae*, and *Staphylococcus aureus* analyses were conducted for all samples. The following microbial counts were used as standards for cleaned and sanitized food-contact and non food-contact surfaces: APC < 1.3 $\log_{10}$ CFU, *Enterobacteriaceae* count < 1.0 $\log_{10}$ CFU, and *Staphylococcus aureus* < 1.0 $\log_{10}$ CFU per sample. Four facilities met standards for all five surfaces for each of the three tests. Fewer operations met the standard for APC than for the other two tests, and refrigerator or freezer handles failed to meet the standard for APC in nearly two-thirds of the operations. Results suggest that microbial standards for surface sanitation are attainable in schools and that school foodservice employees need to receive training and supervision to ensure proper handwashing and appropriate cleaning and sanitation procedures and to limit cross contamination.

INTRODUCTION

Food safety is a major public health concern. Foodborne diseases account for large numbers of illnesses, hospitalizations, and deaths *(14)*, and those numbers have increased steadily during the 1990s *(5)*. A series of articles published in *The Chicago Tribune (11, 12)* dramatized the food safety issue in schools, which led to hearings on school food safety in the US House of Representatives. A representative of the US Government Accounting Office (GAO) *(5)* testified that the increase in foodborne illness outbreaks in schools has been about 10% per year during the 1990s and is proportional to the increase in overall outbreaks. These numbers reflect all outbreaks associated with schools, not necessarily those associated with food served in the school meals programs. For example, The Center for Disease Control (CDC) found that of the 20 largest outbreaks during 1998 and 1999, 13 were associated with food served in the school meals program *(5)*. A more recent GAO report concluded that 3% of reported foodborne outbreaks were associated with schools between 1990 and 1999 and that foods were most likely contaminated with Norovirus *(6)*.

Safe food handling in schools is important because children are considered an at-risk population for foodborne illness. The American School Food Service Association (ASFSA) recently adopted a food safety position statement *(2)* that states that "ASFSA will initiate and support collaborative efforts to ensure that

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TABLE 1. Mean bacterial counts for surface swab samples

Sample[a]	n[c]	Bacterial count[b]					
		Aerobic Plate Count		*Enterobacteriaceae* Count		*Staphylococcus aureus* Count	
		Mean ± SD	Range	Mean ± SD	Range	Mean ± SD	Range
Food Preparation Table	42	3.76 ± 4.50	0 – 5.30	0.16 ± 0.29	0 – 1.0	0.16 ± 0.29	0 – 1.0
Mixing Bowl/Steam-Jacketed Kettle	38	4.10 ± 4.85	0.70 – 5.64	1.00 ± 0.00	1.0 – 1.0	1.47 ± 1.92	1.0 – 2.60
Handwashing Sink	39	4.65 ± 5.17	1 – 5.83	1.22 ± 1.60	1.0 – 2.41	3.07 ± 3.62	0.69 – 4.39
Refrigerator/Freezer Handle	41	4.47 ± 5.11	0.70 – 5.85	1.03 ± 0.41	1.0 – 1.40	2.11 ± 2.68	0.69 – 3.44
Meal Tray	40	1.33 ± 2.11	0 – 2.91	1.00 ± 0.00	1.0 – 1.0	1.00 ± 0.00	1.0 – 1.0

[a]Taken during or just after operational activities

[b]For food contact surface and meal tray samples, the mean is the number of viable bacteria expressed as $\log_{10}$ CFU/cm^2; mixing bowl/steam-jacketed kettle samples are reported as $\log_{10}$ CFU/swabbed area; handwashing sink and refrigerator/freezer handles samples are reported as $\log_{10}$ CFU/handle

[c]Number of samples; not all schools had predetermined contact surfaces; additional samples were taken in their place

schools develop food safety systems so that children have safe food in schools." Almanza and Sneed *(1)* identified three factors that have led to increased emphasis on food safety in schools: greater awareness of national statistics on the causes of foodborne illness; changes in regulations to improve the inspection system and training of foodservice managers; and food safety research that highlights the need for improvements in specific practices in school foodservice operations.

A number of studies have examined food safety practices in schools. An early study in 10 schools *(3)* indicated problems with handwashing and time and temperatures for foods. Gilmore, Brown, and Dana *(9)* identified problems with handwashing and glove use, sanitation of surfaces, and thermometer use in schools. The US Food and Drug Administration's Retail Food Program Database of Foodborne Illness Risk Factors *(7)* summarized observations of food safety risk factors in elementary schools and found that employees were in compliance with appropriate food safety practices between 53 and 66% of observations for adequate handwashing, cold holding of potentially hazardous foods, and personal hygiene. A more recent study *(10)* also found problems with time and temperature control, lack of thermometers and thermometer use, and handling of ready-to-eat foods with bare hands in school foodservice operations. All of these studies used employee observation to assess food handling practices.

Several studies have used microbiological testing in foodservice operations. Kassa et al. *(13)* examined swab samples from surfaces such as handwashing sink faucets, freezer door handles, and food contact surfaces in restaurants and related the microbiological findings to visual inspection results. These authors found that operations received better scores on microbiological tests than they did on visual inspections *(13)*. Another study examined the microbial quality of food contact surfaces and of ready-to-eat cooked foods prepared in a central kitchen *(15)*. The authors did not report standards for assessing the condition of food contact surfaces but characterized microrganism growth as "no growth, rare, small, moderate, and heavy" *(15)*.

Although there is a growing body of knowledge about the presence of bacteria on food contact and frequently handled surfaces in commercial settings, similar microbiological studies for school foodservice environments are lacking. Accordingly, objectives in this study were to determine the effectiveness of cleaning and sanitation of food contact surfaces and the extent and type of microbial contamination on frequently handled surfaces in school foodservice operations.

MATERIALS AND METHODS

Sample. From a total of 372 public and 164 private school districts in Iowa, a total of 40 districts were selected to participate in a three-year research and education project. Schools were recruited by contacting the area consultants of the Iowa Bureau of Food and Nutrition and the nutrition and health field specialists with the Iowa State University Cooperative Extension Service. Some schools were recruited through a Hazard Analysis Critical Control Point (HACCP) training program taught by the researchers.

Swab sampling methods. Swabs were used to collect samples at each school foodservice operation. Surface swab samples were collected from three food contact surfaces (food preparation table, steam-jacketed kettle or mixing bowl, and meal tray), one hand washing sink faucet handle, and one refrigerator or freezer handle; packaged, sterile cotton swabs were used. The tip of each swab was moistened by dipping it in a test tube containing 10 ml sterile phosphate buffered saline (PBS, pH 7.0) containing 0.5% polysorbate (Tween 80) and

TABLE 2. Number of schools within standard bacterial counts for surface swab samples

Sample[a]	Bacterial count[b]						
	Aerobic Plate Count			*Enterobacteriaceae* Count		*Staphylococcus aureus* Count	
	No. of Samples[c]	Acceptable Level	No. of schools meeting standard	Accepted Level	No. of schools meeting standard	Acceptable Level	No. of schools meeting standard
Food Preparation Table	42	< 1.3	39	< 1.0	40	< 1.0	40
Mixing Bowl/Steam Jacketed Kettle	38	< 1.3	25	< 1.0	37	< 1.0	38
Handwashing Sink	39	< 1.3	10	< 1.0	39	< 1.0	33
Refrigerator/Freezer Handle	41	< 1.3	14	< 1.0	38	< 1.0	35
Meal Tray	40	< 1.3	39	< 1.0	40	< 1.0	40

[a]Taken after operational activities when surface had been sanitized

[b]Acceptable levels are expressed as the number of viable bacteria expressed as $\log_{10}$ CFU/cm^2 for food contact surface and meal tray; mixing bowl/steam jacketed kettle, handwashing sink, and refrigerator/freezer handles are expressed as $\log_{10}$ CFU/unit

[c]Number of samples; not all schools had predetermined contact surfaces; additional samples were taken in their place

0.07% soy lecithin. Each moistened swab was rolled repeatedly over the surface during sampling. Using a sterile aluminum template, which exposed a surface area of 10 cm^2 of flat food contact surface, three different 10 cm^2 areas were swabbed with three sterile cotton swabs. The various shapes of handles for faucets, refrigerators, and freezers precluded efforts to sample defined areas of these items. For handles (non-flat surfaces), a 6-inch-up-and-back motion was performed six times, using one swab. After sampling, swabs were aseptically broken into test tubes containing PBS (10 ml per tube). Tubes were marked with a three digit school identification code and a sample number. Samples were held in coolers with crushed ice during transport to the Microbial Food Safety Laboratory at Iowa State University. The transport time to the laboratory was less than three hours. Samples were stored at 4°C in a laboratory refrigerator until tested and were analyzed within 18 hours of arrival at the laboratory.

Microbiological analysis. All samples were analyzed for aerobic plate count (APC), *Enterobacteriaceae* counts, and *Staphylococcus aureus* counts. Microbiological tests were conducted according to the *Compendium of Methods for the Microbiological Examination of Foods (4).* Tubes of samples were vortexed to release organisms from the cotton swabs into the PBS. The aerobic plate count was determined by preparing serial dilutions of samples in 0.1% peptone water (Difco, Detroit, MI) and then surface-plating samples of appropriate dilutions on Tryptic Soy Agar (TSA; Difco). Inoculated TSA plates were incubated at 30°C and bacterial colonies were counted at 48 hours. Counts of *Enterobacteriaceae* were determined by pour-plating samples in TSA (48°C), incubating TSA plates at room temperature (23°C) for 2 h, then overlaying the TSA with 10 ml of melted double-strength violet red bile agar (VRBA-2). Inoculated TSA/VRBA plates were incubated at 35°C and typical colonies were counted at 24 h. Numbers of *Staphyloccus aureus* were determined by surface-plating 1-ml aliquots of diluted samples on Baird-Parker agar (BPA; Difco). Each aliquot was distributed over three BPA plates (0.4 ml. 0.3 ml, and 0.3 ml per plate). The inoculated BPA plates were incubated at 37°C and colonies were counted at 48 h. Typical *S. aureus* colonies were transferred to small pyrex glass vials each of which contained 0.3 ml brain heart infusion (BHI) broth with 0.5 ml reconstituted coagulase plasma. Samples that exhibited firm clotting were considered positive for *S. aureus (4).*

Statistical analysis. Descriptive statistics, including means, standard deviations, and frequencies, were calculated.

RESULTS

The mean aerobic plate count was high for all five sites (food preparation counter, mixing bowl or steam-jacketed kettle, handwashing sink handle, refrigerator or freezer door handle, and meal tray). *Enterobacteriaceae* count was high for both handle samples, and *Staphylococcus aureus* count was high for both handles as well as for the mixing bowl or steam-jacketed kettle (Table 1).

Microbial standards for school foodservice were established in this study for each test based partly on standards defined for cleaned and sanitized foodservice equipment *(8)* and attainability of results by schools in this study. Standards of less than 1.3 $\log_{10}$ CFU for APC, less than 1.0 $\log_{10}$ CFU for *Enterobacteriaceae,* and less than 1.0 $\log_{10}$ CFU for *Staphylococcus aureus* were used.

Although the mean APC was high for handles of handwashing sinks and refrigerators/freezers, a high number of schools achieved the desired standard established in this study (Table 2). Samples with very high bacterial counts dramati-

cally influenced the mean. Of the forty school kitchens, 36 had an acceptable number of colony forming units on one of the food contact surfaces, giving a general indication of good cleaning and sanitation (Table 2). In thirty-nine operations food preparation tables and meal trays met the standard. Twenty-five operations met the standard for mixing bowls or steam-jacketed kettles, ten operations met the standard for handwashing sinks, and 14 met the standard for refrigerator/freezer handles.

Few operations had detectable numbers of *Enterobacteriaceae*. Acceptable numbers of *Enterobacteriaceae* were isolated in the samples for food preparation tables or meal trays. Thirty-seven operations met the standard for mixing bowls or steam-jacketed kettles, 37 for handwashing sinks, and 38 for refrigerator/freezer handles.

A majority of operations met the standard for *Staphylococcus aureus* counts. Less than 1.0 $\log_{10}$ CFU/cm^2 was isolated for *Staphylococcus aureus* in the samples for food preparation tables or meal trays. Thirty-eight operations met the standard for mixing bowls or steam-jacketed kettles, 33 for handwashing sinks, and 35 for refrigerator/freezer handles.

DISCUSSION

A majority of school foodservice operations met the proposed standards for each of the tests performed. The number of operations in which organisms were isolated from handwashing sinks was expected to be high, as employees would begin washing by touching sink handles with contaminated hands. Refrigerator and freezer door handles had unexpectedly high APC. However, this result may largely indicate improper handwashing practices or cross contamination *(7, 10)*. The number of enteric bacteria isolated from samples was low; thirty-seven of the forty operations had mixing bowls or steam-jacketed kettles that met the standard.

Proposed standards for APC, *Enterobacteriaceae*, and *Staphylococcus aureus* were attainable, with a majority of the operations meeting the standards. Thirty-eight schools had all samples below acceptable limits for enteric bacteria, and twenty-nine had *Staphylococcus aureus* counts within an acceptable range. However, there is still need for improvement in overall sanitation and cleaning, inasmuch as APCs were high in some schools. Only 4 of the 40 operations met the standards for all tests on all surface areas. These results indicate the need for continued food safety training as well as for sanitation standard operating procedures (SSOPs), and prerequisite program to HACCP, for school foodservice operations. Further research is needed to determine whether cleaning and sanitizing practices are adequate and whether equipment becomes recontaminated during normal operations.

ACKNOWLEDGMENTS

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Call for Nominations
2005 Secretary

A representative from government will be elected in March of 2005 to serve as IAFP Secretary for the year 2005–2006.

Send letters of nomination along with a biographical sketch to the Nominations Chairperson:

Lee-Ann Jaykus
North Carolina State University
Department of Food Science
Box 7624
Raleigh, NC 27695-7624
Phone: 919.513.2074
Fax: 919.513.0014
E-mail: leeann_jaykus@ncsu.edu

The Secretary-Elect is determined by a majority of votes cast through a mail vote taken in March of 2005. Official Secretary duties begin at the conclusion of IAFP 2005. The elected Secretary serves as a Member of the Executive Board for a total of five years, succeeding to President, then serving as Past President.

For information regarding requirements of the position, contact David Tharp, Executive Director, at 800.369.6337 or 515.276.3344; Fax: 515.276.8655; E-mail: dtharp@foodprotection.org.

Nominations close November 1, 2004.

International Association for Food Protection®

International Association for Food Protection®

Award Nominations

The International Association for Food Protection welcomes your nominations for our Association Awards. Nominate your colleagues for one of the Awards listed below. You do not have to be an IAFP Member to nominate a deserving professional. To request nomination criteria, contact:

International Association for Food Protection
6200 Aurora Ave., Suite 200W
Des Moines, Iowa 50322-2864
Phone: 800.369.6337; 515.276.3344
Fax: 515.276.8655
Web site: www.foodprotection.org
E-mail: info@foodprotection.org

Nominations deadline is March 15, 2005. You may make multiple nominations. All nominations must be received at the IAFP office by March 15, 2004.

- Persons nominated for individual awards must be current IAFP Members. Black Pearl Award nominees must be companies employing current IAFP Members. NFPA Food Safety Award nominees do not have to be IAFP Members.
- Previous award winners are not eligible for the same award.
- Executive Board Members and Awards Committee Members are not eligible for nomination.
- Presentation of awards will be during the Awards Banquet at IAFP 2005 – the Association's 92nd Annual Meeting in Baltimore, Maryland on August 17, 2005.

Nominations will be accepted for the following Awards:

Black Pearl Award — Award Showcasing the Black Pearl

Presented in recognition of a company's outstanding achievement in corporate excellence in food safety and quality.

Sponsored by Wilbur Feagan and F&H Food Equipment Company

Fellow Award — Distinguished Plaque

Presented to Member(s) who have contributed to IAFP and its Affiliates with quiet distinction over an extended period of time.

Honorary Life Membership Award — Plaque and Lifetime Membership in IAFP

Presented to Member(s) for their devotion to the high ideals and objectives of IAFP and for their service to the Association.

Harry Haverland Citation Award — Plaque and $1,000 Honorarium

Presented to an individual for years of devotion to the ideals and objectives of IAFP.

Sponsored by Silliker Inc.

Harold Barnum Industry Award — Plaque and $1,000 Honorarium

Presented to an individual for outstanding service to the public, IAFP and the food industry.

Sponsored by Nasco International, Inc.

Educator Award — Plaque and $1,000 Honorarium

Presented to an individual for outstanding service to the public, IAFP and the arena of education in food safety and food protection.

Sponsored by Nelson-Jameson, Inc.

Sanitarian Award — Plaque and $1,000 Honorarium

Presented to an individual for outstanding service to the public, IAFP and the profession of the Sanitarian.

Sponsored by Ecolab, Inc., Food and Beverage Division

Maurice Weber Laboratorian Award — Plaque and $1,000 Honorarium

Presented to an individual for outstanding contributions in the laboratory, recognizing a commitment to the development of innovative and practical analytical approches in support of food safety.

Sponsored by Weber Scientific

International Leadership Award — Plaque, $1,000 Honorarium and Reimbursement to attend IAFP 2005

Presented to an individual for dedication to the high ideals and objectives of IAFP and for promotion of the mission of the Association in countries outside of the United States and Canada.

Sponsored by Unilever – Safety and Environmental Assurance Centre

NFPA Food Safety Award — Plaque and $3,000 Honorarium

This Award alternates between individuals and groups or organizations. In 2005, the award will be presented to an individual in recognition of a long history of outstanding contributions to food safety research and education.

Sponsored by National Food Processors Association

Call for Abstracts

IAFP 2005
The Association's 92nd Annual Meeting
August 14-17, 2005
Baltimore, Maryland

General Information

1. Complete the Abstract Submission Form.
2. All presenters must register for the Annual Meeting and assume responsibility for their own transportation, lodging, and registration fees.
3. There is no limit on the number of abstracts registrants may submit. However, presenters must present their presentations.
4. Accepted abstracts will be published in the Program and Abstract Book. Editorial changes will be made to accepted abstracts at the discretion of the Program Committee.
5. Photocopies of the abstract form may be used.
6. Membership in the Association is not required for presenting a paper at IAFP 2005.

Presentation Format

1. Technical – Oral presentations will be scheduled with a maximum of 15 minutes, including a two to four minute discussion. LCD projectors will be available.
2. Poster – Freestanding boards will be provided for presenting posters. Poster presentation surface area is 4′ high by 8′ wide. Handouts may be used, but audiovisual equipment will not be available. The presenter will be responsible for bringing pins and velcro.

Note: The Program Committee will make the final decision on presentation format.

Instructions for Preparing Abstracts

1. Title – The title should be short but descriptive. The first letter in each word in the title and proper nouns should be capitalized.
2. Authors – List all authors using the following style: first name followed by the surname.
3. Presenter Name & Title – List the full name and title of the person who will present the paper.
4. Presenter Address – List the name of the department, institution and full postal address (including zip/postal code and country).
5. Phone Number – List the phone number, including area, country, and city codes of the presenter.
6. Fax Number – List the fax number, including area, country, and city codes of the presenter.
7. E-mail – List the E-mail address for the presenter.
8. Format preferred – Check the box to indicate oral or poster format. The Program Committee makes the final decision on the format of the abstract.
9. Category – Check the box to indicate which category best fits the subject of the abstract.
10. Developing Scientist Awards Competitions – Check the box to indicate if the paper is to be presented by a student in this competition. A signature and date is required from the major professor or department head. See "Call for Entrants in the Developing Scientist Awards Competitions."
11. Abstract – Type abstract, double-spaced, in the space provided or on a separate sheet of paper, using a 12-point font size. Use no more than 250 words.

Abstract Submission

Abstracts submitted for IAFP 2005 will be evaluated for acceptance by the Program Committee. Please be sure to follow the format instructions above carefully; failure to do so may result in rejection. Information in the abstract data must not have been previously published in a copyrighted journal.

Abstracts must be received no later than January 7, 2005. Return the completed abstract form through one of the following methods:

1. Online: Use the online abstract submission form located at www.foodprotection.org. You will receive an E-mail confirming receipt of your submission.
2. E-mail: Submit via E-mail as an attached text or MS Word™ document to abstracts@foodprotection.org.

Selection Criteria

1. Abstracts must accurately and briefly describe:
   (a) the problem studied and/or objectives;
   (b) methodology;
   (c) essential results; and
   (d) conclusions and/or significant implications.
2. Abstracts must report the results of original research pertinent to the subject matter. Papers should report the results of applied research on: food, dairy and environmental sanitation; foodborne pathogens; food and dairy microbiology; food and dairy engineering; food and dairy chemistry; food additives and residues; food and dairy technology; food service and food administration; quality assurance/control; mastitis; environmental health; waste management and water quality. Papers may also report subject matter of an educational and/or nontechnical nature.
3. Research must be based on accepted scientific practices.
4. Research should not have been previously presented nor intended for presentation at another scientific meeting. Papers should not appear in print prior to the Annual Meeting.
5. Results should be summarized. Do not use tables or graphs.

Rejection Reasons

1. Abstract was not prepared according to the "Instructions for Preparing Abstracts."
2. Abstract does not contain essential elements as described in "Selection Criteria."
3. Abstract reports inappropriate or unacceptable subject matter or is not based on accepted scientific practices, or the quality of the research or scientific approach is inadequate.
4. Work reported appears to be incomplete and/or data are not presented. Indication that data will be presented is not acceptable.
5. Abstract was poorly written or prepared. This includes spelling and grammatical errors.
6. Results have been presented/published previously.
7. Abstract was received after the deadline for submission.
8. Abstract contains information that is in violation of the International Association for Food Protection Policy on Commercialism.

Projected Deadlines/Notification

Abstract Submission Deadline: January 7, 2005. Submission Confirmations: On or before January 8, 2005. Acceptance/Rejection Notification: February 16, 2005.

Contact Information

Questions regarding abstract submission can be directed to Bev Brannen, 515.276.3344 or 800.369.6337; E-mail: bbrannen@foodprotection.org.

Program Chairperson

Catherine Donnelly
University of Vermont
200 Carrigan Hall
536 Main St.
Burlington, VT 05405-0044
Phone: 802.656.5495; Fax: 802.656.8300
E-mail: catherine.donnelly@uvm.edu

Abstract Form

DEADLINE: Must be Received by January 7, 2005

(1) Title of Paper _____

_____

(2) Authors _____

_____

(3) Full Name and Title of Presenter _____

_____

(4) Institution and Address of Presenter _____

_____

(5) Phone Number _____

(6) Fax Number _____

(7) E-mail _____

(8) Format preferred: ☐ Oral ☐ Poster ☐ No Preference

The Program Committee will make the final decision on presentation format.

(9) Category: ☐ Produce ☐ Foods of Animal Origin ☐ Seafood ☐ Other Food Commodities

☐ Risk Assessment ☐ Education ☐ General Microbiology and Sanitation

☐ Antimicrobials ☐ Pathogens

(10) Developing Scientist Awards Competition ☐ Yes Graduation date _____

Major Professor/Department Head approval (signature and date) _____

(11) TYPE abstract, DOUBLE-SPACED, in the space provided or on a separate sheet of paper, using a 12-point font size. Use no more than 250 words.

Call for Entrants in the Developing Scientist Awards Competitions

Supported by the International Association for Food Protection Foundation

The International Association for Food Protection is pleased to announce the continuation of its program to encourage and recognize the work of students and recent graduates in the field of food safety research. Qualified individuals may enter either the oral or poster competition.

Purpose

1. To encourage students and recent graduates to present their original research at the Annual Meeting.
2. To foster professionalism in students and recent graduates through contact with peers and professional Members of the Association.
3. To encourage participation by students and recent graduates in the Association and the Annual Meeting.

Presentation Format

Oral Competition – The Developing Scientist Oral Awards Competition is open to graduate students (enrolled or recent graduates) from M.S. or Ph.D. programs or undergraduate students at accredited univesities or colleges. Presentations are limited to 15 minutes, which includes two to four minutes for discussion.

Poster Competition – The Developing Scientist Poster Awards Competition is open to students (enrolled or recent graduates) from undergraduate or graduate programs at accredited universities or colleges. The presenter must be present to answer questions for a specified time (approximately two hours) during the assigned session. Specific requirements for presentations will be provided at a later date.

General Information

1. Competition entrants cannot have graduated more than a year prior to the deadline for submitting abstracts.
2. Accredited universities or colleges must deal with environmental, food or dairy sanitation, protection or safety research.
3. The work must represent original research completed and presented by the entrant.
4. Entrants may enter only one paper in either the oral or poster competition.
5. All entrants must register for the Annual Meeting and assume responsibility for their own transportation, lodging, and registration fees.
6. Acceptance of your abstract for presentation is independent of acceptance as a competition finalist. Competition entrants who are chosen as finalists will be notified of their status by the chairperson by May 27, 2005.
7. All entrants with accepted abstracts will receive a complimentary, one-year Student Membership. This membership will entitle you to receive *JFP* Online.
8. In addition to adhering to the instruction in the "Call for Abstracts," competition entrants must check the box to indicate if the paper is to be presented by a student in this competition. A signature and date is required from the major professor or department head.

Judging Criteria

A panel of judges will evaluate abstracts and presentations. Selection of up to five finalists for each competition will be based on evaluations of the abstracts and the scientific quality of the work. All entrants will be advised of the results by May 27, 2005. Only competition finalists will be judged at the Annual Meeting and will be eligible for the awards.

All other entrants with accepted abstracts will be expected to be present as part of the regular Annual Meeting. Their presentations will not be judged and they will not be eligible for the awards.

Judging criteria will be based on the following:

1. Abstract – clarity, comprehensiveness and conciseness.
2. Scientific Quality – Adequacy of experimental design (methodology, replication, controls), extent to which objectives were met, difficulty and thoroughness of research, validity of conclusions based upon data, technical merit and contribution to science.
3. Presentation – Organization (clarity of introduction, objectives, methods, results and conclusions), quality of visuals, quality and poise of presentation, answering questions, and knowledge of subject.

Finalists

Awards will be presented at the International Association for Food Protection Annual Meeting Awards Banquet to the top three presenters (first, second and third places) in both the oral and poster competitions. All finalists are expected to be present at the banquet where the awards winners will be announced and recognized.

Awards

First Place – $500 and an engraved plaque
Second Place – $ 300 and a framed certificate
Third Place – $100 and a framed certificate

Award winners will receive a complimentary, one-year Student Membership including *Food Protection Trends, Journal of Food Protection,* and *JFP* Online.

Policy on Commercialism

for Annual Meeting Presentations

1. INTRODUCTION

No printed media, technical sessions, symposia, posters, seminars, short courses, and/or other related types of forums and discussions offered under the auspices of the International Association for Food Protection (hereafter referred to as to Association forums) are to be used as platforms for commercial sales or presentations by authors and/or presenters (hereafter referred to as authors) without the express permission of the staff or Executive Board. The Association enforces this policy in order to restrict commercialism in technical manuscripts, graphics, oral presentations, poster presentations, panel discussions, symposia papers, and all other type submissions and presentations (hereafter referred to as submissions and presentations), so that scientific merit is not diluted by proprietary secrecy.

Excessive use of brand names, product names or logos, failure to substantiate performance claims, and failure to objectively discuss alternative methods, processes, and equipment are indicators of sales pitches. Restricting commercialism benefits both the authors and recipients of submissions and presentations.

This policy has been written to serve as the basis for identifying commercialism in submissions and presentations prepared for the Association forums.

2. TECHNICAL CONTENT OF SUBMISSIONS AND PRESENTATIONS

2.1 Original Work

The presentation of new technical information is to be encouraged. In addition to the commercialism evaluation, all submissions and presentations will be individually evaluated by the Program Committee chairperson, technical reviewers selected by the Program Committee chairperson, session convenor, and/or staff on the basis of originality before inclusion in the program.

2.2 Substantiating Data

Submissions and presentations should present technical conclusions derived from technical data. If products or services are described, all reported capabilities, features or benefits, and performance parameters must be substantiated by data or by an acceptable explanation as to why the data are unavailable (e.g., incomplete, not collected, etc.) and, if it will become available, when. The explanation for unavailable data will be considered by the Program Committee chairperson and/or technical reviewers selected by the Program Committee chairperson to ascertain if the presentation is acceptable without the data. Serious consideration should be given to withholding submissions and presentations until the data are available, as only those conclusions that might be reasonably drawn from the data may be presented. Claims of benefit and/or technical conclusions not supported by the presented data are prohibited.

2.3 Trade Names

Excessive use of brand names, product names, trade names, and/or trademarks is forbidden. A general guideline is to use proprietary names once and thereafter to use generic descriptors or neutral designations. Where this would make the submission or presentation significantly more difficult to understand, the Program Committee chairperson, technical reviewers selected by the Program Committee chairperson, session convenor, and/or staff, will judge whether the use of trade names, etc., is necessary and acceptable.

2.4 "Industry Practice" Statements

It may be useful to report the extent of application of technologies, products, or services; however, such statements should review the extent of application of all generically similar technologies, products, or services in the field. Specific commercial installations may be cited to the extent that their data are discussed in the submission or presentation.

2.5 Ranking

Although general comparisons of products and services are prohibited, specific generic comparisons that are substantiated by the reported data are allowed.

2.6 Proprietary Information (See also 2.2.)

Some information about products or services may not be publishable because it is proprietary to the author's agency or company or to the user. However, the scientific principles and validation of performance parameters must be described for such products or services. Conclusions and/or comparisons may be made only on the basis of reported data.

2.7 Capabilities

Discussion of corporate capabilities or experiences are prohibited unless they pertain to the specific presented data.

3. GRAPHICS

3.1 Purpose

Slides, photographs, videos, illustrations, art work, and any other type visual aids appearing with the printed text in submissions or used in presentations (hereafter referred to as graphics) should be included only to clarify technical points. Graphics which primarily promote a product or service will not be allowed. (See also 4.6.)

3.2 Source

Graphics should relate specifically to the technical presentation. General graphics regularly shown in, or intended for, sales presentations cannot be used.

3.3 Company Identification

Names or logos of agencies or companies supplying goods or services must not be the focal point of the slide. Names or logos may be shown on each slide so long as they are not distracting from the overall presentation.

3.4 Copies

Graphics that are not included in the preprint may be shown during the presentation only if they have been reviewed in advance by the Program Committee chairperson, session convenor, and/or staff, and have been determined to comply with this policy. Copies of these additional graphics must be available from the author on request by individual attendees. It is the responsibility of the session convenor to verify that all graphics to be shown have been cleared by Program Committee chairperson, session convenor, staff, or other reviewers designated by the Program Committee chairperson.

4. INTERPRETATION AND ENFORCEMENT

4.1 Distribution

This policy will be sent to all authors of submissions and presentations in the Association forums.

4.2 Assessment Process

Reviewers of submissions and presentations will accept only those that comply with this policy. Drafts of submissions and presentations will be reviewed for commercialism concurrently by both staff and technical reviewers selected by the Program Committee chairperson. All reviewer comments shall be sent to and coordinated by either the Program Committee chairperson or the designated staff. If any submissions are found to violate this policy, authors will be informed and invited to resubmit their materials in revised form before the designated deadline.

4.3 Author Awareness

In addition to receiving a printed copy of this policy, all authors presenting in a forum will be reminded of this policy by the Program Committee chairperson, their session convenor, or the staff, whichever is appropriate.

4.4 Monitoring

Session convenors are responsible for ensuring that presentations comply with this policy. If it is determined by the session convenor that a violation or violations have occurred or are occurring, he or she will publicly request that the author immediately discontinue any and all presentations (oral, visual, audio, etc.) and will notify the Program Committee chairperson and staff of the action taken.

4.5 Enforcement

While technical reviewers, session convenors, and/or staff may all check submissions and presentations for commercialism, ultimately it is the responsibility of the Program Committee chairperson to enforce this policy through the session convenors and staff.

4.6 Penalties

If the author of a submission or presentation violates this policy, the Program Committee chairperson will notify the author and the author's agency or company of the violation in writing. If an additional violation or violations occur after a written warning has been issued to an author and his agency or company, the Association reserves the right to ban the author and the author's agency or company from making presentations in the Association forums for a period of up to two (2) years following the violation or violations.

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Sandringham, Victoria

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Pilgrim's Pride Corporation
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Pilgrim's Pride Corporation
Farmerville

MARYLAND

Nancy K. Dick
BD Diagnostic Systems
Cockeysville

Robert I. Merker
US Food and Drug Administration
College Park

Kwang-Young Song
FDA
College Park

MINNESOTA

Steven D. Leitch
Jennie O Turkey Store
Willmar

Alecia A. Viera
Target Corporation
St. Louis Park

Brad Webb
3M Microbiology
St. Paul

Hasan C. Yurttas
Paradigm Diagnostics
St. Paul

MISSISSIPPI

Susan R. Freeman
Sanderson Farms, Inc.
Laurel

MISSOURI

Stephen Buck
Jefferson Co. Health Dept.
Arnold

Steven R. Raithel
Central Dairy
Jefferson City

NEBRASKA

Timothy Mohr
USDA
Omaha

NEW JERSEY

Frank Bova
AIG WorldSource
Berkeley Heights

James V. Giranda
Global Product Safety
Burlington

Frank Guerino
Alpharma
Fort Lee

Dave Horowitz
Danisco USA Inc.
Hamilton

Michelle Malavet
New Jersey Dept. of Health
& Senior Services
Trenton

Charisse R. Newcomer
Kraft Foods
East Hanover

George Sartorio
City of Vineland Health Dept.
Vineland

NEW YORK

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Kraft Foods
Tarrytown

NORTH CAROLINA

Dennis G. Allen
North Carolina State University
Raleigh

Sheryl C. Cates
RTI International
Research Triange Park

Gary E. Coleman
Underwriter's Laboratories, Inc.
Research Triangle Park

Scott R. Jeffrey
bioMérieux
Durham

Efstathia Papafragkoy
North Carolina State University
Raleigh

OHIO

Joel B. Bolt
Ross Products
Columbus

Matthew M. Koleske
Ross Products
Columbus

Anthony J. Lillemoen
Ross Products
Columbus

Virginia Meacham
Cincinnati Health Dept.
Cincinnati

Luis A. Rodriguez-Romo
Ohio State University
Columbus

OREGON

Minda M. Evalle
PML Microbiologicals
Wilsonville

NEW MEMBERS

PENNSYLVANIA

Nicholas Jole
ASK Foods, Inc.
Palmyra

Kevin Jordan
3M
Rochester

Stephen R. Kline
Masterfoods USA
Breinigsville

Fred W. Schweizerhof
Pilgrim's Pride Corporation
Franconia

SOUTH CAROLINA

Julie H. Schlegel
South Carolina DHEC
Columbia

SOUTH DAKOTA

John R. Weaver
Indian Health Service
Aberdeen

TENNESSEE

Carolina Naar
University of Tennessee
Knoxville

Agnes K. Kilozo-Nthenge
Tennessee State University
Nashville

Harry A. Richards
University of Tennessee
Knoxville

Jennifer K. Richards
University of Tennessee
Knoxville

TEXAS

Mary Ann Dowd
Continental Airline
Houston

Edward A. Plante
HEB Grocery Co.
San Antonio

William A. Stone
Pilgrim's Pride Corporation
Mount Pleasant

VERMONT

Elissa Valentine
University of Vermont
Burlington

VIRGINIA

Monica B. Martin
Farm Fresh Markets
Virginia Beach

Ronald C. Matthews
Pilgrim's Pride Corporation
Broadway

Shanker P. Reddy
USDA-AMS-S&T-MPO
Manassas

Chris A. Wozniak
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Steven E. Berntsen
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Bellingham

Susie Craig
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Sammamish

WISCONSIN

Becky Brey
University of Wisconsin
Loyal

Jane Homan
ioGenetics, LLC
Madison

Christine Skeel
Schreiber Foods
Green Bay

UPDATES

Gainco Appoints New Regional Sales Manager

John Chiarella has been appointed as regional sales manager. In this position, Chiarella will be responsible for managing customer relationships and further developing the growing markets in Latin America and the Caribbean. He will be based in the Gainesville, GA facility. Chiarella brings 12 years of poultry processing equipment knowledge to his new post. Prior to joining Gainco, he was the marketing director at FJC International. Chiarella holds an associates degree in business and languages from Gainesville College.

Ron Mellow Has Been Appointed as New Chairman of the Chilled Food Association (CFA)

Ron Mellow has been appointed new chairman for CFA. Ron who was previously vice chairman of CFA, has been a member of the Association's Executive Committee since 1999. He takes over as CFA Chairman from Dr. Geoff Andrews. CFA, with its members, is at the forefront of hygiene standards in chilled food production. These standards are used as the basis of European industry professional guidelines and are promoted worldwide by CFA. CFA is recognized by both UK and European Government departments and agencies as the voice of the £6.6bn UK chilled prepared food industry.

Ron will chair CFA's Board of Directors, comprising senior management representatives of Full Member companies. The Board is responsible for governance and development of CFA. It oversees all CFA activities, and addresses non-technical issues impacting the industry.

Ron started his career with Unilever in 1971, on their graduate management scheme, and worked in a wide variety of roles and locations in UK and Africa. In 1988 he joined United Biscuits in a business subsequently acquired by Heinz in 1999, where he is currently divisional director for the M&S business and has been instrumental in their entry into branded chilled foods.

Sigma-Aldrich Names David A. Smoller New VP of Research and Development

Sigma-Aldrich Corporation is pleased to announce that David A. Smoller, Ph.D., has been named the vice president of R&D. In this role, he will help expand Sigma-Aldrich's leadership position through the development of new and innovative products for Life Science and High Technology research.

Dr. Smoller brings a variety of experience to Sigma-Aldrich. Most recently he was CEO and president of ProteoPlex, a seed stage spinout focusing on functional genomics. Dr. Smoller founded ProteoPlex in 2001 and led the St. Louis-based company through its product development and final acquisition.

In 1992, Dr. Smoller founded Genome Systems, Inc., in St. Louis, which provided the scientific community with access to genome project-related technologies. Genome Systems was acquired in 1996 by the Incyte Corporation, based in Palo Alto, CA. Dr. Smoller joined Incyte as vice president eventually becoming senior vice president and leader of the St. Louis organization growing the staff to more than 250 people.

Grayling Industries Announces Jerry Bauer as Senior Sales Representative for the Guardian Liquid Liner Sales Division

Grayling is pleased to announce the addition of Mr. Jerry Bauer as senior sales representative for Guardian liquid liners. Jerry brings over 27 years sales, business development and product engineering experience in the liquid IBC (intermediate bulk container) packaging industry. Up to this point, Jerry's career has been solely with Mauser/Hoover Materials Group, a leading manufacturer of steel and bottle-in-cage IBCs, where he was instrumental in the growth and success of IBCs in the chemical and food markets. Jerry has a Bachelor of Science degree from the University of Nebraska.

International Association for Food Protection® NEWS

US Signs Agreement with UN Agency on Protecting Food in the Americas: USDA-PAHO Pact Aims to Promote Trade of Safe Food

The US Department of Agriculture (USDA) has signed an agreement with a health agency of the United Nations to improve the protection of food in the Americas.

In a June 24 statement, the Pan American Health Organization (PAHO) said its agreement with the USDA calls for improving protection in the Americas of the "food supply and animal agriculture from intentional and accidental introduction of harmful substances and exotic disease."

In addition, the agreement calls for promoting the trade of safe food in the Western Hemisphere, increasing interchanges of scientists and government food safety officials, and promoting the sharing of resources. Also, the agreement says that by establishing the Free Trade Area of the Americas (FTAA) in January 2005, the Western Hemisphere will become the largest trading bloc in the world. The agreement says that along with the "effects of constant global movement," the new FTAA will result in the need for increased cooperation between PAHO and the USDA.

"The international exchange of people, food, animals, and agricultural products brings with it increased challenges to public health, animal health, and economic growth," the agreement says. Other essential parts of the agreement, which takes effect immediately and covers a period of three years, include promoting greater participation of countries with small-and medium-sized economies in the international "standard-setting processes," and enhancing "program coordination" between USDA and PAHO.

Elsa Murano, USDA under secretary for food safety, said the June 24 signing of the agreement between her department and PAHO is an example of how the Bush administration is "devoted to improving public health through expanded trade of safe food across the globe." Murano added that the agreement comes at a pivotal moment for USDA and PAHO.

"This is a very important first step for us," she said. "I look forward to working with PAHO to further enhance food safety in the Americas." USDA Secretary Ann Veneman says the role of food safety is central to the future of free trade in the Americas and will require extensive cooperation among regional policymakers and organizations.

Veneman told PAHO officials in a 2003 speech that "as we seek to expand and maintain markets and the confidence of consumers in our own countries and worldwide, our challenge will be to address legitimate concerns, in areas such as food safety... without erecting unnecessary barriers to trade."

(The Washington File is a product of the Bureau of International Information Programs, US Department of State. Web site: http://usinfo.state.gov.)

Scientists Find 75 Percent of Red Snapper Sold in Stores is Really Some Other Species

While learning in a course how to extract, amplify and sequence the genetic material known as DNA, University of North Carolina at Chapel Hill graduate students got a big surprise. So did their marine science professors.

In violation of federal law, more than 75 percent of fish tested and sold as tasty red snapper in stores in eight states were other species. How much of the mislabeling was unintentional or fraud is unknown, said Dr. Peter B. Marko, assistant professor of marine sciences at UNC's College of Arts and Sciences.

"Red snapper is the most sought-after snapper species and has the highest prices, and many people, including me, believe it tastes best," Marko said.

"Mislabeling to this extent not only defrauds consumers, but also risks adversely affecting estimates of stock size for this species if it influences the reporting of catch data used in fisheries management. The potential for this kind of bias in fisheries data depends on at what point in the commercial industry fish are mislabeled, which is something that we currently know little about."

A report on his group's research appears in the July 15 issue of the journal Nature. Co-authors are his colleague Dr. Amy L. Moran, research assistant professor of marine sciences, and graduate students Sarah C. Lee, Amber M.

Rice, Joel M. Gramling, Tara M. Fitzhenry, Justin S. McAlister and George R. Harper.

"The red snapper, or *Lutjanus campechanus*, is found in offshore waters around coral reefs and rocky outcroppings and is one of the most economically important fisheries in the Gulf of Mexico, with greater total landings than any other snapper species," Marko and colleagues wrote. "In 1996, the Gulf of Mexico Fishery Management Council and the US Department of Commerce declared that *L. campechanus* was grossly overfished and called for strict management measures to restore stocks to sustainable levels."

"Such restrictions create an economic incentive for seafood substitution, where less valuable species are mislabeled and sold under the names of more expensive ones. Substitutions among closely related fish are difficult to detect, because most distinguishing features are lost during processing."

The team conducted molecular analyses of 22 fish bought from nine vendors in Delaware, Florida, Illinois, Massachusetts, New York, North Carolina, South Carolina and Wisconsin. They found 17, or 77 percent of the samples sold as red snapper were other species. "Our work has a margin of error of 17 percent, meaning that between 60 percent and 94 percent of fish sold as red snapper in the United States are mislabeled," Marko said.

Among those sold as red snapper were lane snapper and vermilion snapper, two other species from the western Atlantic Ocean. Also surprising was that more than half the DNA sequences came either from fish from other regions of the world such as the western Pacific or from rare species about which little is known, he said.

"The remarkable extent of product mislabeling of red snapper threatens to distort the status of fish stocks in the eyes of consumers, contributing to a false impression that the supply of marine species is keeping up with demand," Marko said.

USDA Announces New Initiatives for Improving Food Safety and Public Health

US Department of Agriculture Under Secretary for Food Safety Dr. Elsa Murano has released "Fulfilling the Vision: Initiatives in Protecting Public Health," a document that reviews recent successes and builds on the course laid out last year to improve the prediction and response to food safety challenges in order to further reduce the incidence of foodborne illness.

In 2003, Agriculture Secretary Ann M. Veneman challenged the Food Safety and Inspection Service (FSIS) to find creative and effective ways to continue to improve the safety of US meat, poultry and egg products to better protect public health. FSIS, the public health agency of USDA, and its workforce of over 7,600 inspection and veterinary personnel regulate the safety of these products in approximately 6,000 plants nationwide.

Fulfilling the Vision presents a list of accomplishments for 2003, which included, enhancement to BSE safeguards, the development of new FSIS employee training programs, strengthened food security measures and modernization of enforcement activities. The document also introduces a number of new initiatives to continue FSIS' mission of ensuring food safety.

"We must use science to identify our greatest challenges and meet them head-on," Murano said. "Ensuring the safety of our food supply will require the active participation of everyone who produces, processes and prepares meat, poultry and egg products."

Murano noted that FSIS initiatives to combat *E. coli* O157:H7 and *Salmonella* have resulted in significant reductions in illnesses from those organisms, as reported by the Centers for Disease Control and Prevention (CDC). For example, the CDC recently reported that illnesses from *E. coli* O157:H7 dropped by 36 percent from 2002 to 2003.

CDC's reported trends are also reflected in regulatory sampling for the pathogens done by the Agency.

In Fulfilling the Vision, Murano lays out an ambitious agenda for the future improvement of food safety. These initiatives include: Enhanced Data Integration — FSIS is developing innovative ways to anticipate and predict food safety risks in order to protect public health. To do this, the Agency is examining ways to secure and analyze a wealth of data obtained from industry and other sources so that trends can be recognized and problems quickly identified and corrected.

Apply Risk into Regulatory and Enforcement Activities — FSIS is beginning to field-test the Hazard Control Coefficient (HCC), a measurement of the effectiveness of pathogen controls used by individual establishments. The HCC establishes the level of plant compliance through an analysis of in-plant and Agency verification testing, as well as inspection data. The HCC will help the Agency better understand the frequency and types of food safety failures so that better responses can be designed and implemented.

Associate Program Outcomes to Public Health Surveillance Data — FSIS is working with the Department of Health and Human Services' Centers for Disease Control (CDC) and the Food and Drug Administration (FDA) on public health trends. Data that links foodborne illness outbreaks with specific foods needs to be connected with prevalence data of specific pathogens in specific foods. The Foodborne Diseases Active Surveillance Network, or FoodNet, allows the Agency and its partners to work toward this end by determining the burden of foodborne disease, monitoring foodborne disease trends and determining the extent of foodborne diseases attributable to specific foods. A critical component of this goal is the development of a mathematical model to help estimate illnesses caused by various food commodities.

Improving Food Safety Beyond our Borders — FSIS is working to establish a Food Safety Institute of the Americas to merge the region's resources and provide a focal point for the exchange of food safety information throughout North America. The Agency wants to assist in the development of common food safety standards and harmonize food safety education, information and communication throughout the region.

All of these initiatives will establish a stronger foundation for future advancement and achievements in food safety. It is essential that FSIS continues to modernize its inspection system through risk based approaches and adapt its management agenda to meet ever changing threats and challenges to protect public health.

The complete document, "Fulfilling the Vision: Initiatives in Protecting Public Health," can be found at http://www.fsis.usda.gov.

Foodborne Disease Outbreaks in Australia: 1995 to 2000

Health agencies are increasingly conducting systematic reviews of foodborne disease outbreak investigations to develop strategies to prevent future outbreaks. We surveyed state and territory health departments to summarize the epidemiology of foodborne disease outbreaks in Australia from 1995 to 2000. From 1995 through 2000, 293 outbreaks were identified, with 214 being of foodborne origin. One hundred seventy-four (81%) had a known aetiology, and accounted for 80 percent (6,472/8,124) of illnesses. There were 20 deaths attributed to foodborne illness. Of the 214 outbreaks, bacterial disease was responsible for 61 percent of outbreaks, 64 percent of cases and 95 percent of deaths. The most frequent aetiology of outbreaks was *Salmonella* in 75 (35%) outbreaks, *Clostridium perfringens* in 30 (14%), ciguatera toxin in 23 (11%), scombrotoxin in 7 (3%) and norovirus in 6 (3%). Salmonellosis was responsible for eight of the 20 (40%) deaths, as was *Listeria monocytogenes*. Restaurants and commercial caterers were associated with the highest number of outbreak reports and cases. Outbreaks in hospitals and aged care facilities were responsible for 35 percent of deaths. The most frequently implicated vehicles in the 173 outbreaks with known vehicles were meats 64 (30%), fish 34 (16%), seafood 13 (6%), salad 12 (6%), sandwiches 11 (5%) and eggs 9 (4%). Chicken, the most frequently implicated meat, was associated with 27 (13%) outbreaks. This summary demonstrates the serious nature of foodborne disease and supports the move to risk-based food safety interventions focusing on mass catering and hospital and aged care facilities. Commun. Dis. Intell. 2004:28:211–224.

Meat and Poultry Plants' Food Safety Investments: Survey Findings

Inspectors from USDA's Food Safety and Inspection Service (FSIS) traditionally conducted visual examinations of cattle and poultry during slaughter and processing, looking for disease and other obvious physical defects, and rejecting meat deemed to be unwholesome. FSIS shifted the focus of its food safety inspection procedures in 1996, when the agency promulgated the Pathogen Reduction/Hazard Analysis Critical Control Point rule (PR/HACCP). The meat and poultry processing and slaughter industries have adopted a number of voluntary food safety measures in response to that change in focus, in addition to complying with the new regulation. The PR/HACCP rule employs a system of checks at critical control points where food safety is at risk, requires plant operators to conduct tests for generic *Escherichia coli* (*E. coli*), and imposes *Salmonella* performance standards. Implementation began in 1997 and was mandated by early 2000 in all sizes and types of meat and poultry slaughter and processing plants in the United States.

What is the issue? Anecdotal accounts have been available since the 1980s on industry efforts to ensure food safety. But there are no comprehensive reports of how industry and government concern about food safety have affected processing practices, technologies,

and investment decisions. Prior to the ERS-initiated survey, very little data existed on how the PR/HACCP rule has affected the types of food safety technologies in processing/slaughter plants and the costs plants have incurred and investments they have made independent of PR/HACCP to ensure food safety. ERS initiated the survey in order to obtain data that would provide a better understanding of how the complex mix of technological developments, private markets, and government regulation interact to provide safe and wholesome meat and poultry products.

What did the study find? From 1996 through 2000, US meat and poultry slaughtering and processing plants as a group spent about $380 million annually and made $570 million in long-term investments to comply with the PR/HACCP regulations. During the same time period, the industry spent an additional $360 million on food safety investments that were not required by the PR/HACCP rule. Those figures are much higher than the cost estimate of $1 billion to $1.2 billion spread over 20 years made by FSIS prior to enactment of the regulation, but close to the $623 million in costs projected by ERS in earlier research. FSIS considered primarily administrative costs: recordkeeping, planning, testing, and capital outlays. The ERS analysis also included the costs of hiring the workers necessary to remain in regulatory compliance, and the additional capital outlays necessary to bring each plant up to the standards necessary for regulatory compliance. Notwithstanding the higher cost estimate, projected health benefits still exceed industry costs. A 1997 ERS study estimated benefits of $1.9 billion in annual health cost savings linked with a reduction in foodborne illness due to implementation of new food safety technologies.

Consumer prices of meat and poultry products have been affected very little by PR/HACCP. ERS survey data suggest that the PR/HACCP rule has raised beef and poultry slaughter plant costs by about one-third of 1 cent per pound. These are average prices per pound of beef and not the average cost incurred by each plant. Small plants, which tend to produce more specialized products, had much higher average costs than the giant plants, which produce mainly commodity products, such as boxed beef. Since plants must recover their costs, this means that while prices for commodity products will rise very little, prices for more specialized products, like cut-to-order beef, may rise as much as 2 or 3 cents per pound. It also means that small plants that do compete in commodity markets may find it more difficult to remain in business.

A meat or poultry plant's size was a strong predictor of its choice of food safety technology. Large plants tended to choose equipment and testing technologies; small plants relied more on manual sanitation and adjusting plant operations. Meat and poultry plants made significant new investments to comply with the PR/HACCP rule. However, market forces were also at work. Retail and restaurant customers of meat and poultry plant products and officials receiving exported meat products are vitally concerned about food safety and are in a better position than consumers to ascertain the food safety of the products that they receive. Using this position, they encouraged the use of more sophisticated food safety technologies, an expanded array of food safety practices, and a level of investment beyond that required by the PR/HACCP regulation. US plants that exported products and/or those whose customers specified food safety measures made greater investments in food safety operations than other plants did.

The role played by markets in imposing strict food safety standards on meat and poultry producers has public policy implications. It suggests that information about plant food safety performance provided by FSIS, such as plant quality control performance ratings, could be used by meat and poultry buyers in their purchasing decisions and may encourage greater diligence in performing food safety-related tasks and elicit greater investment in food safety technologies. The ERS/WSU survey provided a substantial amount of data related to PR/HACCP that will be explored more extensively in future studies. Those studies will examine the perceived benefits of PR/HACCP and the long-term rather than the short-term costs of PR/HACCP. They also will examine the impact of plant characteristics, food safety equipment, and processing practices on plant quality control performance. The technological methods plants use to provide food safety is another potential area of investigation. How was the study conducted? ERS designed and funded the survey. Washington State University's Social and Economic Sciences Research Center (SESRC) conducted the survey in early 2001, completing it in May 2002. Surveys forms were sent to 1,725 plants classified as cattle, hog, or poultry slaughter plants or as cooked or raw meat processing plants with no slaughter operations. Of the 1,725 recipients, representatives from 996 plants completed surveys and returned them to SESRC. The survey plants ranged in size from establishments with only a handful of workers slaughtering 1 or 2 animals per week to firms with more than 1,000 workers and producing millions of pounds of product per year.

INDUSTRY PRODUCTS

Data Support Co. Inc.

Fat Analyzer from DSC to Help Protect Consumers

Grocery meat inspectors throughout Los Angeles are now employing the most accurate, precise and reliable equipment available to test the percentage of fat in ground beef labeled and advertised as "lean." The HFT-2000 Fat Analyzer by Data Support Company Inc. (DSC) is the method of choice for Los Angeles County's Department of Health Services' Environmental Health division when conducting routine consumer protection inspections of fat analysis methods and labeling requirements at supermarkets and other ground beef retailers.

The HFT-2000 by DSC, a leader in the fat and moisture analyzer sales industry, replaces the county's previously used 50-year-old antiquated testing equipment, which has been proven to produce erroneous results in cuts of meat containing less than 10 percent fat. While 400 Costco stores nationwide use the HFT-2000 to test fat levels in their ground beef, thousands of other supermarkets use the antiquated fat testing units once employed by inspectors. The county's move to update fat analyzers for inspections will prevent Los Angeles consumers from being misled by labels marketing meat as leaner than it actually is.

The "plug and weigh" 9-pound HFT-2000 is easy to use and requires minimal user training. Its accurate fat content analysis is based on the instrument's ability to measure the moisture content of a sample over a range of temperatures. Simply place a palm-sized amount of beef in the instrument's weighing chamber, close the lid and select the appropriate program from the front panel. The HFT-2000 does the remainder of the work and automatically shuts off when the test is complete (10 to 15 minutes). The results are displayed on the digital screen. Easy cleanup is also key; users simply discard the disposable filter pads and aluminum tray.

Data Support Co., Inc.
800.726.5883
Encino, CA
www.dsctest.com

Food Safety Net Services, Ltd. Announces a New Laboratory Facility Opening in Phoenix, Arizona

In our efforts to provide nationwide customer service and technical expertise that exceeds all expectations, Food Safety Net Services, Ltd. is pleased to announce a new >10,000 square foot facility to be located in Phoenix, AZ. This laboratory will be headed up by Sharon P. Wood, vice president of laboratory services; laboratory manager, David Bosco; and supported by a team of degreed technical staff members. As with our other ISO/IEC 17025 and USDA-FSIS accredited facilities, the Phoenix laboratory will continue to provide the excellent management, technical expertise, and quality service that Food Safety Net Services, Ltd. has provided our customers and the food industry over the years.

Food Safety Net Services, Ltd.
210.477.3626
San Antonio, TX
www.food-safetynet.com

Brazilian Government Approves BAX® System as Official Reference Method to Detect *Salmonella*

The BAX® system, a genetics-based diagnostic tool developed by DuPont Qualicon, has been approved by the Ministry of Agriculture in Brazil as an Official Reference Method to detect *Salmonella* in food, water and environmental samples.

An evaluation conducted by the Ministry on over 1,800 samples in five laboratories concluded that the BAX® system was equivalent to the traditional culture method that has been used by the government for the last 40 years.

Be sure to mention, "you saw it in *Food Protection Trends*"!

"This validation is an important step by the Ministry of Agriculture, showing its new vision toward modernization of the Brazilian Food Safety System," stated Josinete Barros de Freitas, coordinator of the Food Microbiology Department, CLA-MAPA.

According to Madasa do Brasil, DuPont Qualicon's local distributor who supported the validation process, "This achievement makes the BAX® system the first and only rapid detection method to obtain Official Reference Method status in Brazil. It also marks the first time the government has announced an Official Reference Method by brand name."

"The BAX® system has set the standard for rapid method pathogen testing in Brazil," said Kevin Huttman, president of DuPont Qualicon. "We're delighted to be part of this historic event, where the government has approved not genetics-based technology in general but the BAX® system specifically as the Official Reference Method for *Salmonella* testing."

Salmonella is a serious, sometimes fatal, food pathogen often found in poultry. Although thorough cooking will kill the bacteria, cross-contamination can occur through contaminated utensils and hands. An estimated 11,000 cases of salmonellosis are reported annually in Brazil, where poultry is the largest agribusiness sector of the country's animal protein production. In 2003, Brazil produced 7.87 million metric tons of poultry, with exports of more than 1.92 million metric tons.

The food regulatory agency for the state of São Pãulo, along with some of the country's top food companies, began using the BAX® system last year to detect *Salmonella*. As an Official Reference Method, the BAX® system can now be used throughout Brazil to help ensure the safety of the country's food supply and protect the future of its exports.

The DNA-based BAX® system detects target bacteria in raw ingredients, finished food products and environmental samples. In addition to *Salmonella*, assays are also available for detecting *E. coli* O157:H7, *Enterobacter sakazakii*, *Listeria* and *L. monocytogenes*. The automated system is user-friendly and fits easily onto a laboratory bench top.

DuPont Qualicon
800.863.6842
Wilmington, DE
www.qualicon.com

PROTECTA Landscape is Bell Laboratories' Discreet, Full-featured, Tamper-resistant Rodent Bait Station

Bell Laboratories, Inc., a manufacturer of rodent control products, introduces new PROTECTA Landscape, a tamper-resistant rodent bait station that easily blends in with outdoor landscapes. Available in two realistic colors, sandstone and granite, PROTECTA Landscape is textured for a more natural appearance.

PROTECTA Landscape locks upon closing, and a single lock opens with the standard Bell key. The built-in service record card holder, one-piece liner and side-opening design make servicing fast and easy. Four vertical bait securing rods hold eight 1 oz Blox securely inside the station. As with PROTECTA and PROTECTA Sidewinder bait stations, PROTECTA Landscape accommodates a TRAPPER T-Rex rat snap trap.

Made of heavy-duty, injection molded plastic, with a durable hinge built to withstand frequent servicing, PROTECTA Landscape offers the superior durability you have come to expect in PROTECTA tamper-resistant bait stations.

Bell Laboratories
608.241.0202
Madison, WI
www.belllabs.com

Control Products Introduces the First Standard Controller with Embedded NAFEM Compliant Internet Connectivity, Eliminating the Need for an External Gateway

Control Products, Inc. is pleased to introduce the TCA-150PE temperature controller. This device is part of our IntelliNet™ family of products. It is the first low cost, compact, off-the-shelf controller that combines temperature control with embedded NAFEM compliant Internet connectivity into a single unit. Designed for heating and refrigeration applications, this device can be installed in minutes in new or retrofit applications.

The TCA-150PE connects via Ethernet™ to enterprise level software, such as Raptor Software™ a product of E-Control Systems. E-Controls is an alliance partner of Control Products, Inc. This total solution provides an enterprise management and information system which can be used to integrate and automate the On-line

Kitchen concept. Raptor Software™ is comprised of three main software modules which include Versatile Reporting Module, Food Safety Module, and Asset Management Module.

The combined Control Products/E-Control Systems solution is scalable. Applications can be as simple as one TCA-150PE controlling and monitoring one piece of equipment along with a Raptor Software™ package to view, monitor, and record results anywhere in the world. Additional equipment can be easily brought on-line as applications change or new equipment is added to the kitchen.

Also, Control Products has products including external gateways and a General Purpose Controller which can add NAFEM compliant Internet connectivity to legacy food service equipment.

According to Chris Berghoff, president of Control Products, "The TCA-150PE and future spin-offs of this device, along with Raptor Software™, will accelerate the implementation of the On-line Kitchen concept. For the first time, the cost of a control system with NAFEM Data Protocol is now affordable."

Control Products, Inc.
800.947.9098
Chanhassen, MN
www.controlproductsinc.com

Open Chute Drum Dumper from Flexicon

A new open chute drum dumper from Flexicon Corporation offers a low cost method of discharging bulk solid materials from drums

Flexicon Corporation

when dust generation is not a concern. The drum lift assembly is raised electrically until material discharges from the drum, onto the chute, and into a receiving vessel. The smooth, wide-diameter product chute allows unobstructed discharge of free-flowing materials as well as non-free-flowing products containing large agglomerates.

The unit accommodates drums of all popular sizes and can discharge directly into process equipment or optional hoppers equipped with pick-up adapters for Flexicon pneumatic conveying systems (shown) or transition adapters for Flexicon flexible screw conveyors, or with universal flanged outlets.

It is fully accessible and free of crevices for rapid, thorough cleaning, and available in carbon steel with durable industrial finishes, or in stainless steel with material contact surfaces finished to industrial, food or pharmaceutical standards.

Flexicon also produces Lift-and-Seal drum dumpers for applications requiring total dust containment. Other equipment manufactured by the company includes bulk bag dischargers, bulk bag fillers, manual dumping stations, weigh batching and blending systems, and engineered plant-wide bulk handling systems with automated controls.

Flexicon Corporation
888.353.9426
Bethlehem, PA
www.flexicon.com

Wilshire Technologies Launches DuraCLEAN with LYCRA® Glove Product for the Food Processing Industry

Wilshire Technologies, a manufacturer of extended-wear gloves, announced the availability of its exclusive DuraCLEAN® with LYCRA® glove product for the food processing industry.

The gloves meet FDA standards for multiuse utensil designation, and the company officially launched the product at the Institute of Food Technologists show in Las Vegas.

Wilshire Technologies saw a need for their DuraCLEAN with LYCRA product in the food processing industry to solve the two primary objectives of the market: protect workers and prevent food contamination. Such breaches in protection occur when using less durable products, such as latex, vinyl and nitrile, and can cascade to negatively impact food product yield and shelf life. DuraCLEAN with LYCRA also does not contain chemical additives, surfactants or accelerators that can flake off the glove and contaminate the food.

"It's no accident that glove parts end up in food. Many of the current glove types used in food handling are

Be sure to mention, "I read about it in *Food Protection Trends*"!

borrowed from other industries, and don't have the resilience necessary to withstand the rigors of a food processing line," said Derek Warneke, vice president of marketing and technology at Wilshire Technologies.

"The result is a false sense of security. Latex, vinyl and nitrile gloves rip and tear easily, and the glove pieces end up in food. In contrast, our DuraCLEAN with Lycra product is designed specifically to work in demading environments such as a food processing plant, and can help significantly reduce production risks," said Warneke.

Aside from food pieces, the heat build-up that other glove types cause enables bacteria to grow rapidly, especially in the fingernail regions where most of the glove breaks occur. This can create an out-of-control situation quickly. DuraCLEAN with LYCRA gloves allow heat to dissipate, thereby reducing the potential for bacteria growth.

Moreover, DuraCLEAN with LYCRA users can clean and sanitize the gloves using standard hand washing or sanitizing protocols without the product degrading in strength or cleanliness. The gloves also maintain a smooth, durable surface, and thus reduce the adhesion of food soils and microbial contaminants.

Food processing facilities can reduce operational costs significantly as well by providing DuraCLEAN with LYCRA gloves to its line workers. One pair of Wilshire's gloves will last an average of 2.5 days, while the typical food processing line employee will go through 6–10 pairs of latex gloves each day. DuraCLEAN with LYCRA's tactile sensitivity and comfort also improves worker efficiency and dexterity, resulting in less time away from the production line to change broken or sweaty gloves. Such benefits can also positively impact employee morale.

"For a thin-walled glove, our DuraCLEAN with LYCRA product is as close to bullet proof as you're going to get. We're proud of meeting the FDA standard for multiuse utensil designation, as it further validates the fact that our gloves are a critical and valuable tool for food processing production," said Kevin Mulvihill, president and CEO of Wilshire Technologies.

Wilshire Technologies
800.433.3340
Carlsbad, CA
www.wilshiretech.com

Sigma-Aldrich Corporation Introduces High Throughput PEPscreen™ Custom Peptide Library Technology

Sigma-Genosys has developed a new proprietary high throughput custom peptide synthesis platform using state-of-the-art technology.

The PEPscreen™ peptide synthesis platform allows high throughput synthesis of custom peptide libraries (6–20 amino acids) comprising thousands of peptides at 70% purity. Higher purity is available upon request. Peptides are synthesized in quantities from 0.5–2mg in which 100% of the peptides are analyzed by MALDI-TOF mass spectroscopy. The unprecedented speed and efficiency of the PEPscreen™ synthesis platform allows peptide libraries to be synthesized, analyzed and delivered in less than 7 days.

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"Until now, the cost, complexity and delivery time of custom peptide synthesis has made peptide screening applications beyond the affordability of the research community. Sigma-Genosys' novel and innovative PEPscreen™ technology will enable large numbers of researchers in all industry sectors to rapidly screen hundreds to thousands of peptides in a variety of functional assays at a dramatically reduced cost," says Michael Hadjisavas, global strategic marketing manager for Protein Expression and Proteomics.

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Thermo Electron Corporation Introduces the Orion AQUAfast® AQ4500 Turbidimeter for Low Level Turbidity Readings

Thermo Electron Corporation introduces the new Orion AQUAfast AQ4500 Turibidimeter, ideal for both lab and field measurements for food and beverage and water waste water applications.

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The Orion AQUAfast AQ 4500 Turbidimeter is the most advanced measurement system on the market today. Ideal for use in either the lab or the field, the AQUAfast AQ 4500 offers dual light sources that allow readings to comply with either EPA 180.1 or ISO 7027. Measurements can range from 0–1000 NTU with a choice of units: NTU, FTU, FNU, ASBC, or EBC.

AQUAfast AQ4500 conforms to the guidelines of both the American Society of Brewing Chemists and European Brewing Chemists. It also complies with the EPA GLI method 2, in the range of 0–40 NTU. Up to 100 data points can be stored to be downloaded to a printer or computer and the typical battery life is over 1,000 hours. The Orion AQ4500 is truly IP67 waterproof and has excellent correlation with online turbidity instruments.

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Chicago, IL
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COMING EVENTS

OCTOBER

- **5–7, ASTM Committee E27 on Hazard Potential of Chemicals,** Omni Shoreham, Washington, D.C. For more information, contact Scott Orthey at 610.832.9730; E-mail: sorthey@astm.org.
- **6, Alberta Association for Food Protection Annual Meeting,** University of Alberta Faculty Club, Edmonton, Alberta, Canada. For more information, contact Lynn McMullen at 780.492.6015; E-mail: lynn.mcmullen@ualberta.ca.
- **6–8, Kansas Environmental Health Association Annual Fall Meeting,** Best Western Inn, McPherson, KS. For more information, contact Cynthia Kastens at 620.842.6000; E-mail: ckastens@sedgwick.gov.
- **7–8, Advanced HACCP,** St. Louis, MO. For more information, contact ASI Food Safety Consultants at 800. 477.0778 ext. 113; E-mail: jhuge@asifood.com.
- **11–12, Food Safety Conference 2004,** Gold Coast Convention and Exhibition Centre, Queensland, Australia. For more information, go to www.foodsafetyconference.com.au.
- **12–13, Associated Illinois Milk, Food and Environmental Sanitarians Annual Fall Meeting,** Stoney Creek Inn, East Peoria, IL. For more information, contact Terry Fairfield at 815.490. 5570; E-mail: terry_fairfield@deanfoods.com.
- **12–14, Applied Extrusion Workshop,** University of Nebraska Food Processing Center, Lincoln, NE. For more information, contact Pauline Galloway at 402.472.9751; E-mail: pgalloway2@unl.edu.
- **17–20, UW-River Falls 24th Food Microbiology Symposium,** "Current Concepts in Foodborne Pathogens and Rapid and Automated Methods in Food Microbiology," University of Wisconsin-River Falls, WI. For more information, call 715.425.3704; E-mail: foodmicro@uwrf.edu.
- **19, Metropolitan Association for Food Protection Annual Meeting,** Rutgers, Cook College, New Brunswick, NJ. For more information, contact Carol Schwar at 908.689.6693; E-mail: cschwar@entermail.net.
- **19–20, 9th Annual Dairy Cleaning and Sanitation Short Course,** Cal Poly Dairy Products Technology Center, San Luis Obispo, CA. For more information, contact Laurie Jacobson at 805.756.6097; E-mail: ljacobso@calpoly.edu.
- **19–20, Sensory Techniques,** CCFRA Technology Ltd., Chipping Campden, Glos, UK. For more information, contact Chantal Gilbert at 44.1386.842256; E-mail: training@campden.co.uk.
- **19–21, 2nd International Symposium on Spray Drying of Milk Products,** Maryborough House Hotel, Maryborough Hill, Douglas, Cork, Ireland. For more information, call 353.25.42237; E-mail: spraydrying2004@moorepark.teagasc.ie.
- **20–22, Florida Association for Food Protection Annual Educational Conference,** Adam's Mark Hotel, Clearwater Beach, FL. For more information, contact Marjorie Jones at 561.871.7405; E-mail: marjorie.jones@avendra.com.
- **25–26, Brazil Association for Food Protection Annual Fall Meeting,** Conselho Regional de Quimica, São Pãulo, Brazil. For more information, contact Maria Teresa Destro at 55.113.091.2199; E-mail: mtdestro@usp.br.
- **25–29, Dairy Technology Workshop,** Birmingham, AL. For more information, call 205.595.6455; E-mail: us@randolphconsulting.com.
- **28–30, North Dakota Environmental Health Association Annual Fall Meeting,** Seven Seas Conference Center, Mandan, ND. For more information, contact Debra Larson at 701. 328.1291; E-mail: djlarson@state.nd.us.

NOVEMBER

- **3–4, Implementing *Listeria* Intervention and Control Workshop,** Chicago, IL. For more information, contact American Meat Institute Foundation at 703.841.2400 or go to www.meatami.com.
- **3–4, Sanitary Design: A Practical Perspective,** GFTC, Guelph, Ontario, Canada. For more information, contact Marlene Inglis at 519.821.1246; E-mail: minglis@gftc.ca.
- **4–5, Lead Auditor,** Atlanta, GA. For more information, contact ASI Food Safety Consultants at 800.477.0778 ext. 113; E-mail: jhuge@asifood.com.
- **5, SQF Systems Awareness,** GFTC, Guelph, Ontario, Canada. For more information, contact Marlene Inglis at 519.821.1246; E-mail: minglis@gftc.ca.
- **5–6, Mexico Association for Food Protection Annual Fall Meeting,** Guadalajara, Jalisco, Mexico. For more information, contact Lydia Mota De La Garza at 01.5794.0526; E-mail: dra_lydia_mota@lei.com.mx.
- **7–11, FPMA (Food Processing Machinery Association) Expo,** McCormick Place, Chicago, IL. For more information, call 800.331.8816 or go to www.foodprocessingmachinery.com.
- **9–10, Principles of Food Safety Auditing/Inspection,** Four Points Sheraton Hotel Chicago O'Hare, Chicago, IL. For more information, contact AIB at 785.537.4750; or go to www.aibonline.org.
- **9–10, Principles of Food Safety Auditing/Inspection,** Atlanta, GA. For more information, contact AIB at 785. 537.4750 or go to www.aibonline.org.
- **17, HACCP: A Management Summary,** GFTC, Guelph, Ontario, Canada. For more information, contact Marlene Inglis at 519.821.1246; E-mail: minglis@gftc.ca.
- **18, Ontario Food Protection Association Annual Fall Meeting,** Stage West, Mississauga, Ontario. For more information, contact Gail Evans Seed at 519.463. 6320; E-mail: ofpa_info@worldchat.com.

DECEMBER

- **1–2, Food Plant Sanitation,** GFTC, Guelph, Ontario, Canada. For more information, contact GFTC at 519.821. 1246; E-mail: gftc@gftc.ca.

IAFP UPCOMING MEETINGS

AUGUST 14-17, 2005
Baltimore, Maryland

AUGUST 13-16, 2006
Calgary, Alberta, Canada

JULY 8-11, 2007
Lake Buena Vista, Florida

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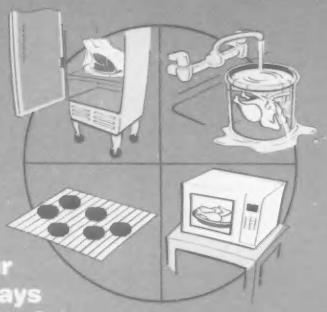
Be aware when you prepare



There are four acceptable ways to thaw food safely.

1. In a refrigerator at 41˚F (5˚C) or lower
2. Under running water at 70˚F (21˚C) or lower
3. In a microwave oven
4. As part of the cooking process

Control time and temperature.

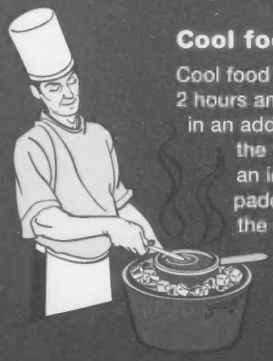
Keep food out of the temperature danger zone of 41˚F to 135˚F (5˚C to 57˚C) as much as possible. Prepare food in small batches. Refrigerate food if interrupted during preparation. Refrigerate or cook food as soon as you are done with preparation.

Prevent cross-contamination.

Wash your hands before working with each food. Use different cutting boards to keep raw and ready-to-eat food separate. Clean and sanitize equipment and work surfaces after each task.

Always cook food to its required minimum internal temperature to keep it safe.

Check the minimum internal cooking temperature for each food with a thermometer. Temperatures will vary from food to food.



Cool food rapidly.

Cool food from 135˚F to 70˚F (57˚C to 21˚C) within 2 hours and from 70˚F to 41˚F (21˚C to 5˚C) or lower in an additional 4 hours. To cool food quickly: divide the food into smaller portions, put the food in an ice-water bath, and stir regularly with an ice paddle. You can also use a blast chiller to cool the food more rapidly.

nfsem

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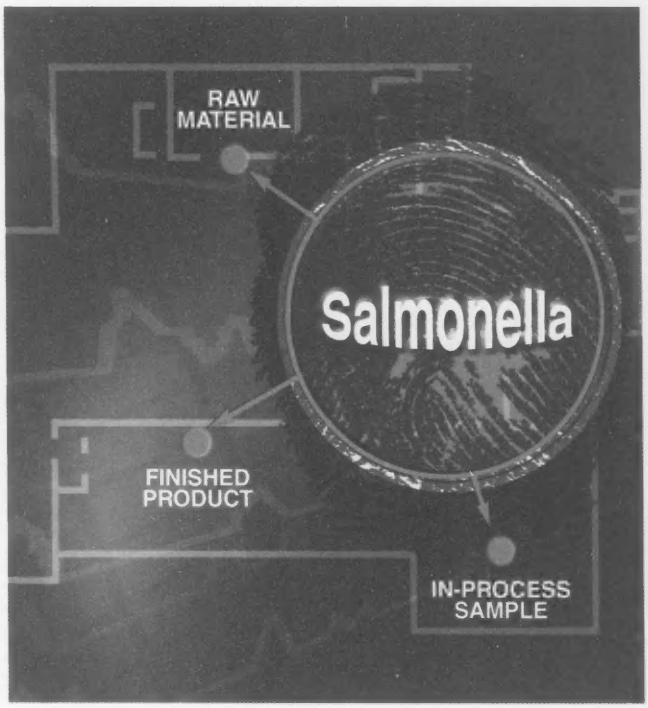

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