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Periodicals

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# Food Protection Trends

**Science and News** from the International Association for Food Protection

Assessing Management Perspectives  
of a Safe Food-handling Label

Characterization of Food Safety Knowledge,  
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IAFP 2009 in Review



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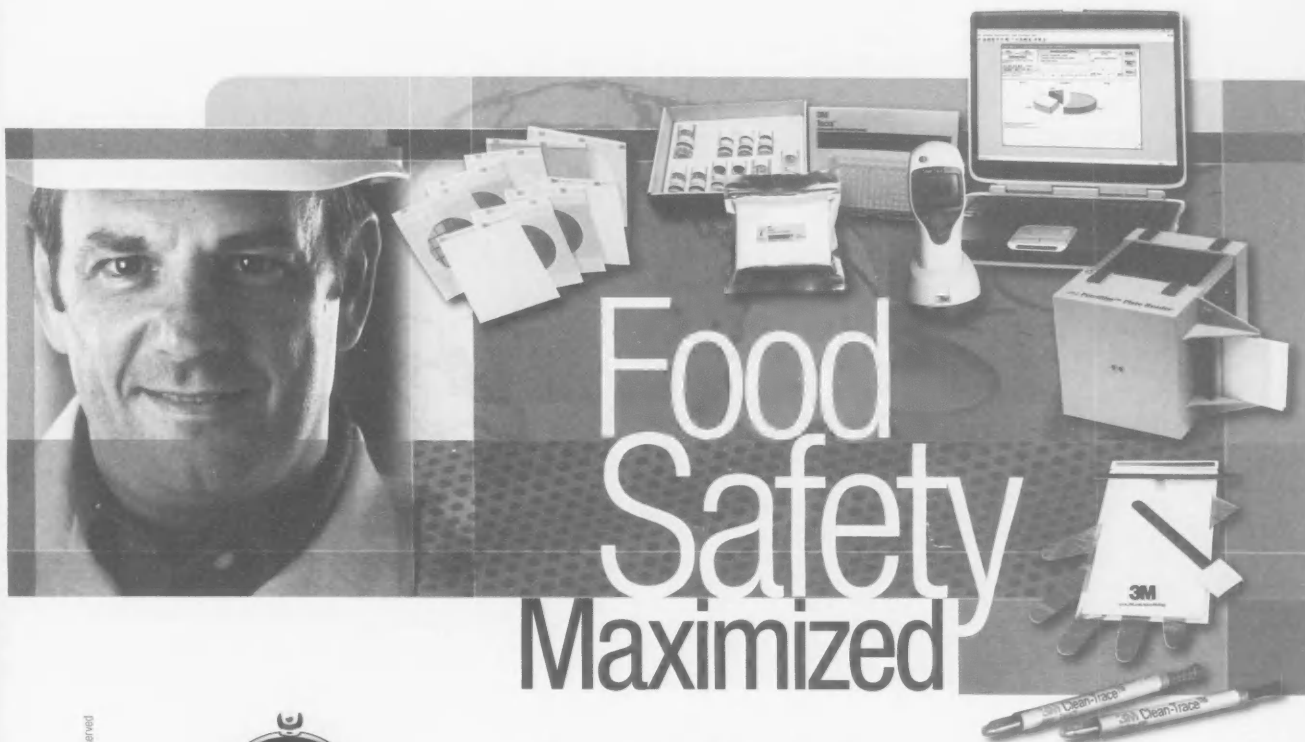
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AOAC, 2007. Isolation and identification of *Salmonella* from meat, poultry, and egg products in Microbiology Laboratory Procedures, 10th ed., Food Safety and Inspection Service, U.S. Department of Agriculture, Washington, D.C.  
1. Food and Drug Administration, 2003. Bacteriological Analytical Manual Online, AOAC International, Gaithersburg, MD.  
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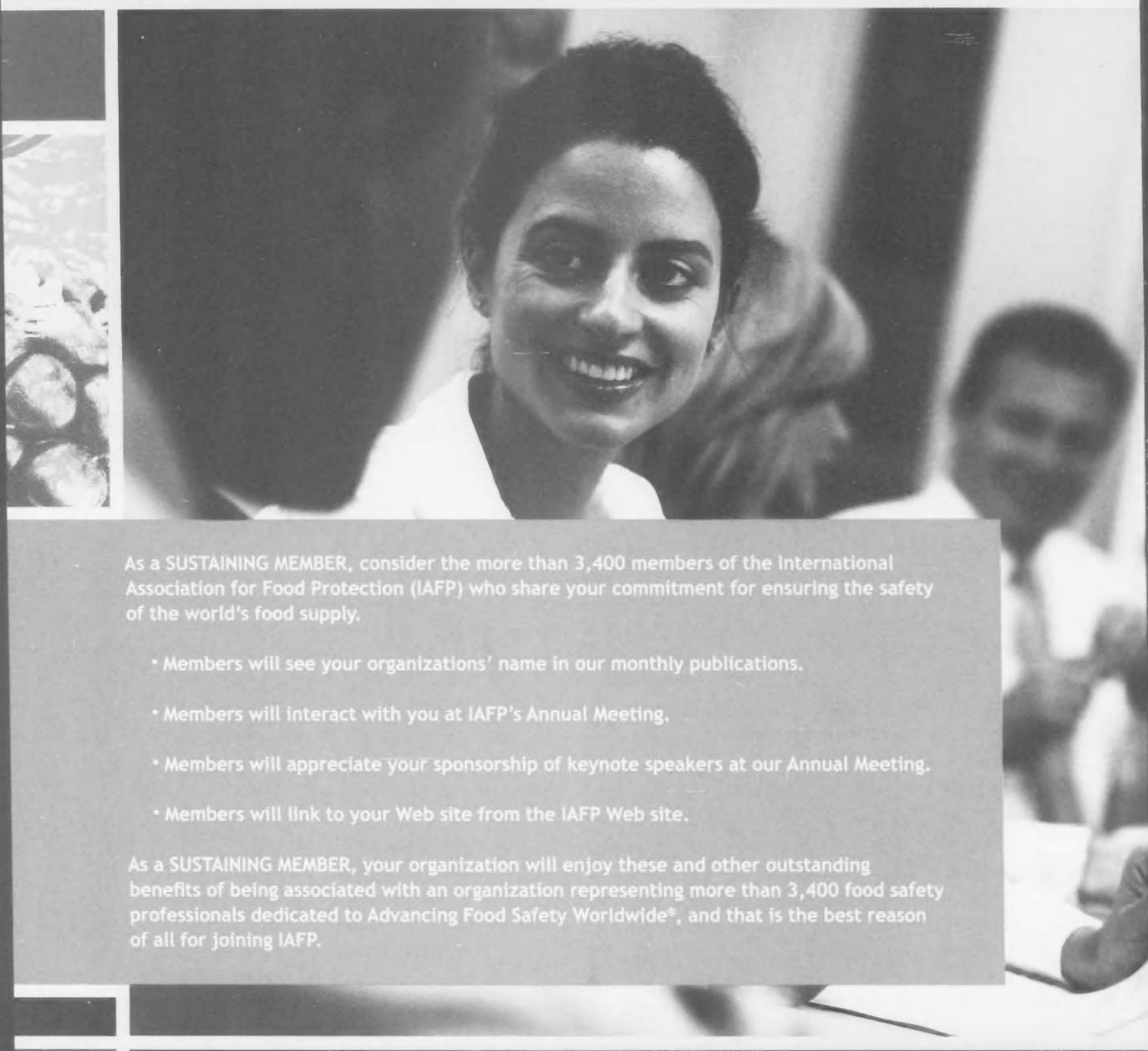




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[www.kroger.com](http://www.kroger.com)

**Lester Schwab Katz & Dwyer, LLP;**  
Short Hills, NJ; [www.lskdnylaw.com](http://www.lskdnylaw.com)

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MN; [www.malt-o-meal.com](http://www.malt-o-meal.com)

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[www.msu.edu](http://www.msu.edu)

**Microbial-Vac Systems, Inc.,** Bluffdale,  
UT; [www.m-vac.com](http://www.m-vac.com)

**MicroBioLogics, Inc.,** St. Cloud, MN;  
[www.microbiologics.com](http://www.microbiologics.com)

**Microbiology International,** Frederick,  
MD; [www.800ezmicro.com](http://www.800ezmicro.com)

**Micro-Smedt,** Herentals, Belgium;  
[www.micro-smedt.be](http://www.micro-smedt.be)

**Nasco International, Inc.,**  
Fort Atkinson, WI; [www.nasco.com](http://www.nasco.com)

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Inc.,** Dublin, CA; [www.thenfl.com](http://www.thenfl.com)

**Nelson-Jameson, Inc.,** Marshfield,  
WI; [www.nelsonjameson.com](http://www.nelsonjameson.com)

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[www.neogen.com](http://www.neogen.com)

**Nestlé USA, Inc.,** Dublin, OH;  
[www.nestle.com](http://www.nestle.com)

**NSF International,** Ann Arbor, MI;  
[www.nsf.com](http://www.nsf.com)

**OpGen,** Gaithersburg, MD; [www.opgen.com](http://www.opgen.com)

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Canada; [www.oxoid.com](http://www.oxoid.com)

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Park, PA; [www.psu.edu](http://www.psu.edu)

**Process Tek,** Des Plaines, IL;  
[www.processtek.net](http://www.processtek.net)

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**REMEL, Inc.,** Lenexa, KS;  
[www.remel.com](http://www.remel.com)

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San Diego, CA; [www.steritech.com](http://www.steritech.com)

**Strategic Diagnostics Inc.,** Newark,  
DE; [www.sdix.com](http://www.sdix.com)

**Texas A&M University-Center  
for Food Safety,** College Station, TX;  
[www.tamu.edu](http://www.tamu.edu)

**ThermoDrive LLC,** Grand Rapids, MI;  
[www.thermodrivellc.com](http://www.thermodrivellc.com)

**United Fresh Produce Association,**  
Washington, D.C.; [www.unitedfresh.org](http://www.unitedfresh.org)

**Walmart,** Bentonville, AR; [www.walmart.com](http://www.walmart.com)

**Walt Disney World Company,**  
Lake Buena Vista, FL; [www.disney.com](http://www.disney.com)

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Rochester, NY; [www.wegmans.com](http://www.wegmans.com)

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## "VICKIE'S VIEW" FROM YOUR PRESIDENT

As I write this column, my boys, Max and Jack, are getting ready to start a new school year. Max will be in third grade and Jack will be a full-time student this year in first grade. It's hard to believe how fast time is passing. As I watch them and listen to them prepare for their next steps, it reminds me of how I felt at the beginning of each new school year—nervous, optimistic and excited! Which homeroom teacher will I get, and will he or she like me? Will my friends be in my class? How many recesses will we get? And of course, there is the fun of buying new shoes, new clothes, new backpacks and school supplies. Perhaps this excitement is really about the opportunity to have a fresh start every fall, a "do-over" if you will. It's a chance to show your teachers and schoolmates how much you've changed over the summer, what new "identities" you're trying on for size, what improvements you've made and how you've grown.

As we journey through life we encounter these feelings with each new experience: college, career, marriage, starting a family, and so on. I have been fortunate to work for several major food companies during my career, and each time I began a new job I was filled with this new-school-year nervousness and optimistic excitement. I truly believe that when we are in this heightened emotional state of mind is the turning point at which we can accomplish the most! But it's difficult to sustain that state of mind. My guess is that by January, my boys will be wishing school was done for the year and will be counting down the days to summer vacation. So, how do we, as food safety professionals, stay excited, motivated and optimistic as the initial



By **VICKIE LEWANDOWSKI**  
PRESIDENT

***"There are opportunities everywhere you look in your life; you just might not recognize them as such"***

"newness" in our career paths wears off? Who does the responsibility of keeping us challenged, excited and motivated fall to? How do we stay excited and engaged beyond that "fresh-start" autumn feeling? I think the answer is to look for, make and seize our own opportunities. Don't wait for things to happen or for the golden opportunity to fall into your lap; it's not likely to happen! As Elinor Smith was quoted, "It has long since come to my attention that people of accomplishment rarely sat back and let things happen to them. They went out and happened to things."

Lest you think I am just quoting quotes, I'll give you an example from my own work experience. Last summer I identified a coworker who was going out on a planned medical leave. I suggested to my managers and my coworker's managers that I do a short-term, cross-functional assignment in her absence. All parties agreed to the temporary arrangement. I was very nervous and excited to take on this new assignment. It gave me a different perspective of how a food company works, and allowed me to interact on a daily basis with many different functions within the company. Overall, it was an excellent experience for me and I learned so much and so many different things that I made a change in my career path. After 23 years of being solely focused on microbiology and food safety, I made a move into the Business Unit Quality Department. Now, you might think that this might have dampened or diluted my passion for and focus on food safety. But what I've found is that a major focus of the quality side of the house is microbiology and food safety, and in fact, the Quality Department encompasses both food protection and brand protection on multiple levels. Seizing this opportunity has reenergized my career and renewed my personal and professional excitement, optimism and passion for food protection.

There are opportunities everywhere you look in your life; you just might not recognize them as such. What we might initially view as a problem, a hassle, or a roadblock is really an opportunity. You might not always have the support and resources you think are needed, but looking at situations or issues from a fresh perspective can help us to overcome barriers and succeed in ways that turn out to be among the greatest and most rewarding.

Similarly, being a member of IAFP offers many opportunities; you just need to find them and seize them. Some of the opportunities to benefit from include networking, knowledge-sharing, development of public speaking and presentation skills and career opportunities, just to name a few. IAFP has more than 3,400 members across more than 50 countries. More than 1,700 of those members attend the Annual Meeting. The meeting this year featured more than 500 presentations, including 29 symposia, three interactive roundtables, 95 technical and 333 poster presentations. There are also numerous opportunities to develop leadership skills, with more than 15 Professional Development Groups (PDGs) having both chair and vice chair positions that rotate on an annual

basis. There is also the opportunity to recognize colleagues with awards. Each year, nominations for more than a dozen awards are accepted to recognize excellence in food protection research, education and efforts. (By the way, the deadline for 2010 award nominations is February 16, 2010.) IAFP also has a career service for employers and job seekers that many companies and members have benefitted from.

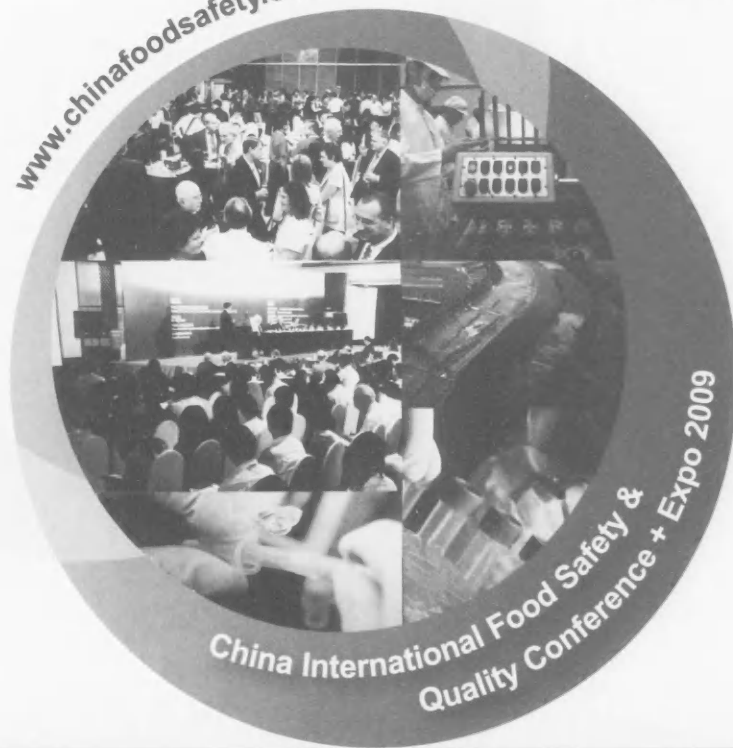
The current changes and focus on food safety by consumers and the government is an excellent and important opportunity for us to seize, as well. As food safety professionals, we have always been dedicated to global food safety, but with the proposed changes on the horizon it is our chance to really make a difference. Newly passed legislation and proposed changes are on the table now, but it's

going to be up to us to shape, enact, and enforce these new strategies and laws. Each of those activities is an opportunity. I urge you to take some time to research and understand everything that is being proposed. Determine what the impact will be on your company, institution or agency. Help develop and shape the plans for implementation within your organization. Seize this opportunity to add value and truly influence the shape of global food safety for your future and the future well-being of all consumers.

Before I go back to sharpening pencils and my math skills to help Max and Jack with their new opportunities, I leave you with this quote from writer and columnist Frank Scully: "Why not go out on a limb? Isn't that where the fruit is?" As always, feel free to contact me at anytime at [VLewandowski@kraft.com](mailto:VLewandowski@kraft.com).

## New Dates November 4–5, 2009

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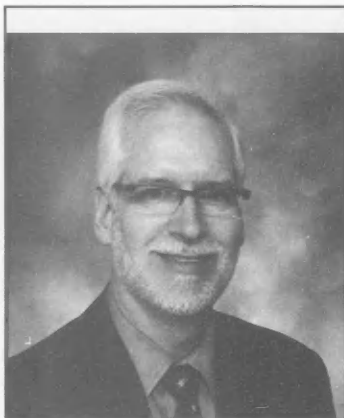
## “COMMENTARY” FROM THE EXECUTIVE DIRECTOR

This issue of *Food Protection Trends* is our Annual Meeting review issue. Within, you will find a review of the meeting, pictures of award recipients, pictures from the meeting, committee minutes, minutes from the Annual Business meeting and session summaries. It is a complete wrap up of IAFP 2009 that was held in Grapevine, Texas!

We should take a few minutes upfront here to talk about the great attendance at IAFP 2009. In comparison to 2008, our total attendance was down by just 5%! This is truly an amazing performance by IAFP Members and attendees as many educational meetings have seen reductions in attendance figures ranging from 20% to 40% and even 50%. We were so happy to have recorded more than 1,725 attendees at IAFP 2009. Even though our exhibitors were down in numbers just a little, the exhibit hall maintained good traffic with most exhibitors reporting “excellent contacts” and very good interest in their products and services.

We are fortunate to have a great number of very supportive sponsors and exhibitors! It has been said many times, but the support offered by our exhibitors and sponsors help IAFP to offer many attendee benefits that have now come to be expected. These include the lunches in the exhibit hall, coffee and refreshment breaks, and the social receptions each day in the exhibit hall. These events add so much to our Annual Meeting and the sponsorships help to keep it all affordable for attendees!

Please take a few minutes to review the Award recipients beginning on page 652. These people were selected because of their dedication to IAFP and the leadership they have shown in food safety. While you



By **DAVID W. THARP, CAE**  
EXECUTIVE DIRECTOR

**“One of the  
new ways we  
are working to  
expand IAFP’s  
reach is through  
social media”**

review these individuals and groups, be thinking about who you know that should be nominated for an IAFP Award. Our nominations for 2010 are due in February, but it is not too early to start the nomination process!

Just a short note while talking about nominations; secretary nominations are due on November 1.

If you know of an IAFP Member from the education sector who the Nominations Committee should consider, let us know right away! You can make it as easy as just submitting an E-mail directly to me or David Golden, our Nomination Committee Chairperson.

OK, back to the Annual Meeting now. Did you know that the Student PDG provides assistants to each session room at Annual Meeting – and they write a summary of each session for publication in *FPT*? These summaries can be reviewed beginning on page 683. So, if you were unable to attend the Annual Meeting this year, you still can get the feel of being there by reading these summaries! If something catches your interest, I’m sure the presenter would be happy to provide additional details about their presentation. Should you need help in making contact, our office can assist you.

The minutes from the Annual Business meeting are presented on page 708 and are followed by minutes from Committees and Professional Development Groups (PDGs). It was encouraging to see so many of the PDGs discuss and recommend holding educational sessions via Webinars or teleconferences. IAFP has been looking to increase the number of avenues for Members to communicate, and these are only two of the possibilities.

One of the new ways we are working to expand IAFP’s reach is through social media. To begin with, we established an IAFP page on Facebook where we can reach a much wider audience than only IAFP Members. IAFP can post information about upcoming conferences or events. Members (or anyone for that matter) can become a “fan” of IAFP and will receive the posts



when they occur. There are options for conversations between fans on our page. Currently, the best part of IAFP's Facebook page is that there are over 100 pictures from IAFP 2009! Be sure to search us out, become a fan, and take a look at the pictures while you are there.

To summarize, IAFP 2009 was a great success in more ways than

one. We were really pleased with the attendance which led to excellent educational sessions that led to many networking opportunities, which led to big prospects for exhibitors and sponsors, which ended up substantiating the expense incurred to attend IAFP's Annual Meeting! We hope as the economy improves, more employers will recognize the

wonderful value derived from the relatively small outlay to participate with IAFP.

Continuing your lifelong education and making valued contacts through IAFP's meetings is an important part of your professional growth. Let us never forget how fortunate we are to be able to continue expanding our knowledge!



## CALL FOR TECHNICAL AND POSTER ABSTRACTS IAFP 2010

August 1-4, 2010  
Anaheim Convention Center  
Anaheim, California

Call for Abstract Instructions  
and Submission Form

Available at  
[www.foodprotection.org](http://www.foodprotection.org)

**Abstract Submission Deadline: January 20, 2010.**

Questions regarding abstract submission can be directed to: Tamara Ford, Phone: 800.369.6337; 515.276.3344; E-mail: [tford@foodprotection.org](mailto:tford@foodprotection.org), or go to [www.foodprotection.org](http://www.foodprotection.org).

# Assessing Management Perspectives of a Safe Food-handling Label for Casual Dining Take-out Food

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## ABSTRACT

Faced with the threat of food safety litigation in a highly competitive industry, foodservice establishments must take proactive steps to avoid foodborne illness. Consumer demand for convenience food, coupled with evidence that consumers do not always engage in proper food-safety practices, means that take-out food from casual dining restaurant establishments can lead to food safety concerns. A prescriptive safe food-handling label was designed through a Delphi-type exercise. A purposive sample of 10 foodservice managers was then used to evaluate the use of the label on take-out products. Semi-structured in-depth interviews focused on the level of concern for food safety, the value of labelling take-out products, perceived effectiveness of the provided label, and barriers to implementing a label system. Interviews were audiotaped and transcribed, and the data was interpreted using content analysis to identify and develop overall themes and sub-themes related to the areas of inquiry. It was found that labeling is viewed as a beneficial marketing tool by which restaurants can be differentiated from their competitors based on their proactive food safety stance.

## INTRODUCTION

In 2002, the American Dietetic Association and ConAgra Foods Foundation (1) commissioned Impulse Research Corporation to conduct a market research study of consumer perceptions and behavior specifically related to restaurant take-out food. The study found that 24 percent of adults surveyed felt ill after consuming restaurant take-out food. Further, inadequate knowledge of proper food-handling practices – temperature abuse during storage and improper reheating procedures – was a common self-reported risk factor. Research conducted by Bruhn and Schutz (2) on consumer knowledge of safe food-handling guidelines and their reported practices suggest that consumers misperceive the severity of foodborne illness and fail to associate at-home food-handling practices with foodborne illness. Therefore, food such as take-out, which is initially prepared in a restaurant but is consumed in an individual's home, may be a venue to target with safe food-handling messages. Both Chicago-based Francesca Restaurants and Boston-based Buca Di Beppo Restaurants have reported anecdotal success of placing food safety

A peer-reviewed article

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E-mail: dpowell@ksu.edu

**FIGURE 1.** Safe Food-Handling Label



**TABLE 1.** Examples of theme-centered questions as posed by the interviewer

Topics	Questions
Food-safety concern	Could you please comment on the extent to which food poisoning can be life threatening?
Value of labeling	How serious a problem is consumer mishandling of take-out food? Do you believe that consumers take risks with take-out and leftover foods?
Label effectiveness	How well do you think the label works to change consumer behavior? Do you think that the label contributes to informed consumption even for consumers who chose not to follow the safe food-handling guidelines? How does the label impact the consumer's image of the restaurant?
Implementation barriers	Could you please describe the barriers to using the labels as intended?

labels on containers of take-out food (4, 11).

Green and Selman (6) found that management plays a significant role in the extent to which front-line employees engage in safe food preparation activities. It is assumed that if management perceives the safe food-handling label as a useful tool for food safety education, and an extension of service quality and

consumer satisfaction (which presumably leads to greater profits), it is likely that they will emphasize and facilitate the use of the label as a final step in the safe preparation of take-out food. The purpose of this research was to: (1) examine restaurant managements' experience of using a safe food-handling label on take-out food, (2) explore managements' food safety concerns, (3)

determine the value of consumer safe food-handling labels to managers, (4) establish perceived label effectiveness, and (5) identify challenges with implementation.

For the purpose of this research, take-out is defined as food procured from a casual dining restaurant (i.e., sit-down restaurant) but eaten elsewhere, including food ordered as take-out and leftover food packaged to be taken home. This disregards take-out food procured from a quick service restaurant (i.e., fast food outlet or takaway/take-out outlet), which is most often eaten immediately following delivery and therefore negates concerns related to improper food-handling by consumers that promotes the growth of pathogenic microorganisms.

## MATERIALS AND METHODS

### Safe food-handling label development

A safe food-handling label for take-out was developed through a Delphi-type method, which used an iterative process with feedback from experts in the field of food safety and risk communication (Fig. 1). The method utilized the four main features that define a process as Delphi: anonymity, iteration, controlled feedback, and aggregation of group response (14). Experts were chosen to participate based on personal contacts and a subsequent snowball effect. The goal of the label was to provide information regarding methods of safe food-handling that consumers were likely to understand, including a time frame in which to refrigerate uneaten take-out after receipt, in addition to a time frame in which to safely consume it after refrigeration along with suggested safe temperatures for each. Space for the date and time were included on the label to provide a time reference.

### Sample selection

The label was presented to 10 purposively selected casual dining restaurants in southwestern Ontario, Canada, including five franchises of a small Canadian restaurant chain. These restaurants were selected based on their geographic proximity to the researchers,

**TABLE 2. Themes described by restaurant manager interview participants**

Theme	Sub-themes
Food-safety concern	Fear of litigation Media reports Word of mouth
Value of labeling	Brand image Consumer information Employee training Escape from litigation
Label effectiveness	Behavior change Informed consumption
Implementation barriers	Consumer characteristics Employee and management characteristics Restaurant structure

take-out sales volume, and/or established relationships with the researchers that provided a solid foundation for a project partnership. Each restaurant was provided with an unlimited supply of labels for use on their take-out containers for a period of six months. No compensation was offered, and all restaurants participated on a voluntary basis.

### Interviews

Following approval by the Research Ethics Board at the University of Guelph, a total of 10 face-to-face, semi-structured in-depth interviews (lasting 30–60 minutes) were conducted with employees responsible for management activities at the selected restaurants. Though the number of interviews may seem small, McCracken (10) states that as few as eight respondents are sufficient when using this methodology.

Interview questions addressed the following areas: food safety concerns; the value of safe food-handling labels; perceived label effectiveness; and challenges with implementation. Table 1 includes examples of the questions presented by the researcher who conducted all 10 interviews. Additional probing

questions were prepared to discover more information or to improve clarity from participants where necessary. Demographic data was also collected from participants. All interviews were recorded on audiotape except in one case; instead, extensive notes were taken.

### Analysis

Interview recordings and handwritten notes were transcribed and the text analyzed using qualitative content analysis, defined by Hsieh and Shannon (8) as “a research method for the subjective interpretation of the content of text data through the systematic classification process of coding and identifying themes or patterns.” A directed approach to content analysis was used to organize text into four themes relating to the purpose of the research: restaurant managements’ experience of using a safe food-handling label on take-out food, specifically exploring managements’ food safety concerns, the value of consumer safe food-handling labels to managers, perceived label effectiveness, and challenges with implementation. Each of these themes was further broken down into sub-themes, as shown in Table 2, using a conventional approach to qualitative content analysis (8).

## RESULTS

### Demographics

Table 3 presents the demographic information on the sample used in this study. The majority of the 10 participants selected were men ( $n = 8$ ), were 35–45 years of age (range 20–56 years; mean 36 years), had a mean of 20 years experience in the foodservice industry (range, 6–35 years), and had all earned some type of food safety certification. Four out of the 10 participants had no higher than a high school education.

### Concern for food safety

All of the participants reported an awareness of the consequences of foodborne illness, both in terms of human health and the potential economic implications of poor consumer food-handling practices for their businesses. Concerns about food safety were fueled by fear of litigation as increasingly reported in the United States, as well as negative word-of-mouth communications by consumers increasingly aware of quality and safety issues related to what they eat. As one participant shared:

*“Obviously there’s a lot of concern out there with food, with food safety and food poisoning. And obviously it’s a major lawsuit if it happens in your establishment – that concerns me as a manager – that, and the health of our customers.”*

### Perceived value of labeling

All of the participants stated that the label was a good initiative (e.g., “great idea”), perceiving the labels to add value to their products and services. Hedging against litigation and, to a lesser extent, the providing of information to facilitate informed customer decision-making, were identified as valuable additions to their businesses. Using the label as a marketing tool to advance brand image, and as an indirect educational approach to influence desired overall employee food safety behavior, were reported as additional potential benefits. Many participants found the label valuable in enhancing their image as a consumer-minded business. Positive responses from consumers led many managers to believe that voluntarily applying the labels to inform

**TABLE 3. Demographics of restaurant manager participants (n = 10)**

Demographic variable	Frequency, n	Demographic variable	Frequency, n
<b>Age (years)</b>		<b>Industry experience</b>	
18–24	1	5–10	1
25–34	3	10–20	3
35–44	5	20–30	5
45–54	0	35+	1
55+	1	<b>Food safety certification<sup>a</sup></b>	
<b>Gender</b>		Yes	8
Female	2	No	2
Male	8		
<b>Education level</b>			
12 years or fewer	4		
13 years or more	6		

<sup>a</sup>Paths to food safety certification may include local public health unit-issued certificates, or ServSafe management food safety-training program.

consumers of food safety issues differentiated their product from competitors' in a positive way. One participant explained:

*"I think that food safety is a wonderful marketing tool . . . it creates a competitive demand in the market segment in which if the competitor isn't doing it, it separates the restaurant . . . the restaurant will lose this advantage over time as other people catch-up, but for now let's use the label as a marketing tool."*

Most participants felt that the label provided important information to customers leading to informed consumption. From this aspect of information asymmetry, one participant stated:

*"Using these stickers makes me more comfortable with people taking their food away from this place because then you've done what you can to provide the customer with information – hey it's safe, but now it's in your hands, you paid for it, and so it's your responsibility."*

When discussing the label as a supplemental tool for employee training, several participants credited the label with raising employee awareness about take-out food safety. According to one participant:

*"That's the real benefit of the label – is that it's in their face. They can't brush it under the carpet. It's there, and it's front and center, and they have to physically take it off and put it on the container and that's the great exchange."*

However, other participants felt there was disconnection between management and employees that hindered its food safety message to employees. For example:

*"They've just been told that they're putting the label on every take-out container. Anything that they have to package up and bring to the guests, they have to put a label on it. Whether they understand it or not, I'm not sure, but they know that that's what they've got to do and they do it."*

Overall, restaurant managers were acutely aware of the impact improper food handling could have on their customers and their business; the greatest motivator for label use by these managers was a fear of litigation. One participant reflected:

*"I think that it's a great idea just from the liability aspect. If I saw a sticker on my take-out food I would think twice about calling that restaurant and saying that I got sick from food that came from that restaurant."*

### Label effectiveness

As evident by a few equivocal responses, restaurant managers were uncertain about the label's ability to positively impact consumer food handling behavior. For example, when asked whether or not they believed the label had the potential to change consumer behavior, one participant replied:

*"That is a really good question and it's hard to quantify. If the customer has a heightened awareness about food safety, then the label is of value – they'll pay attention to it. If the customer doesn't have that heightened awareness, then I think that it's just a part of the décor on the package."*

While none of the participants came to the conclusion that the label compelled customers to change their food-handling behavior in relation to take-out food, all of them believed that the label was at least effective from an informed consumption perspective – meaning that the majority of customers read the label (e.g., "I'm assuming that probably at least 75% of the customers will look at it and read it."). When asked what led them to this conclusion, participants relied on observation and provided comments such as:

*"We've had some positive feedback with those stickers from guests who actually took the time to read it, and thought that it was a very good idea."*

### Barriers to implementation

Nearly half of the restaurant managers said they experienced no problems with employee buy-in and that the labels were being used as intended, which included writing the date and time that the food was packaged in the space provided on the label (e.g., "No problems. The labels are right beside our take-out containers. Basically, the guy takes the container, puts the label on and then puts a date on it."). Others identified several barriers to label implementation. Results indicated that the most prominent barriers that must be overcome before implementing the use of safe food-handling labels on restaurant take-out on a permanent basis were consumer characteristics (personal preferences, complaints), employee and management characteristics (attitudes, behavior), and, to a lesser extent, restaurant structure (time pressure, high volume of business).

While the date and time were included on the label to provide consumers with a time reference for when to safely consume or when to discard the take-out food, this feature allowed for an unexpected negative consequence related to consumer preferences for quality (i.e., freshness). According to one manager:

*"The biggest problem that we were finding with [the label] is people are a little ticked off when they see that the food was packaged 20 minutes ago. You know the sticker informed them of the time, so that's a big deal for us to deal with as well. The customer knows it's not that fresh and so on and so forth."*

Specifically, these consumers preferred to receive their take-out almost immediately after packaging and the time provided on the label notified the consumer of the exact length of time between packaging and receipt. Managers who perceive safe food-handling labels to communicate negatively with consumers may be unwilling to use the tool.

Several participants discussed employee motivation (or lack thereof)

as a factor impacting use of the label. For example:

*"Well, most of them think it's a pain in the butt. You got to remember these guys are servers and they just want to make money, you know. Do they really care about whatever happens? No they don't."*

As the interview progressed, the same participant added:

*"...again, the biggest obstacle is that these people couldn't care once the customer is out the door, to be honest with you."*

One establishment's employees often forgot to apply the labels, but later resolved the problem of irregular use by including in its food runners' job description the responsibility to affix a label to approximately 40 or 50 take-out containers at the beginning of each shift.

Finally, participants felt that time pressure caused by high volumes of business made it difficult to ensure that the label was being used.

As one manager shared:

*"When the project first started, sure, we were using the label all of the time, but then as time went by, we have so many things to do in a restaurant that its just one more thing to do ... I feel that we failed the project in a lot of ways. We could have been more diligent, but understand, too, with the sheer volume that we do and the responsibility that we have ensuring that the people in the restaurant are happy—and we do a lot of take-out—I think that a lot of it did slip through the cracks, to be honest with you."*

### DISCUSSION

The fear of litigation that motivated members of restaurant management involved in this study to embrace the safe food-handling labels provided is similar to that observed in a study of produce growers (3) in which the threat of lawsuits, damaged reputations, and significant drops in sales resulting from major foodborne outbreaks connected to firms was found to influence the choice to implement food safety practices. Results from this study also support conclusions by Roosen (13) that product differentiation can occur through food safety issues, though Caswell (5) reported that to this point, communicating this type of information

via product labeling has been under-used. Skepticism of several participants as to whether providing the information actually influenced consumers' food-handling behaviors reflect findings of previous studies of safe food-handling instructions provided on raw meat and poultry products, in which researchers determined that a larger educational campaign that involved the label would be necessary to motivate behavioral change in consumers regarding safe food-handling practices (12, 15). Results of the current study suggest that the effectiveness of the label may depend upon the attitude of the consumer upon receipt, just as previous research indicates that providing this sort of information to food handlers can be effective when it accompanies the belief that their behavior is important (7).

Some results of the current study can be used to improve the use of safe food-handling labels on take-out food in the future. The perceived benefits of the label to restaurant managers and consumers were limited by the attitudes of consumers toward the information provided and by elements of restaurant structure and environment that lead to inconsistent application. Jenkins-McLean, Skilton, and Sellers (9) determined that behavior of employed food-handlers might be influenced when perceived barriers and benefits are understood. Therefore, training employees to handle the aforementioned barriers may be the step necessary to allow implementation. For example, employees may benefit from coaching on how to address patron complaints related to delayed food delivery, or instruction in time management and organizing priorities to include label application. Pre-emptive application of labels to a number of take-out containers before service begins is recommended for the future use of labels in order to avoid leaving the label off when employees are pressed for time to package take-out.

### CONCLUSIONS

A concern that must be addressed in future research is the possible mistaken belief that the presence of a safe food-handling label, while perhaps adding a layer of protection between their business and potential litigation should a consumer become ill from mishandled

take-out, also provides some guarantee of food safety. Managers believing the label to protect them from all possibility of litigation would be sadly surprised if a consumer made ill from the restaurant's take-out was found to be sickened as a result of contamination in the restaurant's kitchen, and not as a result of the consumer's own poor handling of the food. In this case, litigation could be rightfully brought against the restaurant and the safe food-handling label would be no mechanism to defend it. This point must be understood by restaurant managers and employees to prevent a false sense of security from dampening the importance of other food-safety measures in restaurant practice.

Future research may be used to address some of the limitations of the current study. For example, the small sample size of the current study, though sufficient to draw conclusions with the methodology used, may limit the ability to generalize conclusions to the entire casual dining industry. Subsequent studies conducted with larger samples may be necessary to verify the universality of the present findings. Future research may also consider the cost of materials as a potential barrier to the implementation of safe food-handling label use, as well as methods to overcome that barrier such as take-out boxes pre-printed with a label. Additional studies on consumer reactions to safe food-handling labels could further understanding of the practicality and effectiveness of this communication tool.

The results presented here suggest that the use of a safe food-handling label for take-out food is a promising value-added investment for restaurant operators, provided that efficient processes are in place to ensure its application and

that employees are well-versed in its use and believe that it adds value from both a business and public health perspective.

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## REFERENCES

1. American Dietetic Association and ConAgra Foods Foundation. 2002. 'Ins' and 'outs' of doggy bag dining. *Impulse Research Corporation*, Los Angeles, CA.
2. Bruhn, C. M., and H. G. Schutz. 1999. Consumer food safety knowledge and practices. *J. Food Safety* 19:73-87.
3. Calvin, L., B. Avendano, and R. Schwentesius. 2004. The economics of food safety: The case of green onions and hepatitis A outbreak. Outlook Report No. VGS30501. United States Department of Agriculture - Economic Research Service.
4. Carr, G. 2006. Safety stickers go on doggy bags. The Beacon News (Aurora, Illinois). Available at: [http://food-safetynetwork.ca/fsnet/2003/9-2003/fsnet\\_september\\_23.htm#RESTAURANTS](http://food-safetynetwork.ca/fsnet/2003/9-2003/fsnet_september_23.htm#RESTAURANTS). Accessed 6 September 2006.
5. Caswell, J.A. 1998. How labeling of safety and process attributes affects markets for food. *Agric. Resour. Econ. Rev.* 27(2):151-158.
6. Green, R., and C. Selman. 2005. Factors impacting food workers' and managers' safe food preparation practices: A qualitative study. *Food Prot. Trends*. 25(12): 981-990.
7. Greenfield, T. K., K. L. Graves, and L. A. Kaskutas. 1999. Long-term effects of alcohol warning labels: Findings from a comparison of the United States and Ontario, Canada. *Psychol. Mark.* 16(3):261-282.
8. Hsieh, H.-F., and S. E. Shannon. 2005. Three approaches to qualitative content analysis. *Qual. Health Res.* 15(9):1277-1288.
9. Jenkins-McLean, T., C. Kilton, and C. Sellers. 2004. Engaging food service workers in behavioral-change partnerships. *J. Environ. Health* 66(9):15-19.
10. McCracken, G. 1998. The long interview. *Sage Publications*, Beverly Hills, CA.
11. Prewitt, M. 2003. Tips for takeout: Growing group uses safe-handling labels to prevent illness. *Nation's Restaurant News*, 37(34), 1.
12. Ralston, K. L., and C.-T. Lin. 2001. Safe handling labels for meat and poultry: A case study in information policy. *Consumer Interests Annual* 47:1-8.
13. Roosen, J. 20-21 March 2003. Marketing of safe food through labeling. Paper presented at the 2003 Food and Agriculture Marketing Policy (FAMPS) Conference, Washington, D.C.
14. Rowe, G., and G. Wright 1999. The Delphi technique as a forecasting tool: Issues and analysis. *Int. J. Forecast.* 15: 353-375.
15. Yang, S., F. J. Angulo, and S. F. Altekruze. 2000. Evaluation of safe food-handling instructions on raw meat and poultry products. *J. Food Prot.* 63(10):1321-1325.

# Characterization of Food Safety Knowledge, Attitudes, and Behaviors of Adolescents in East Tennessee

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## ABSTRACT

Educational interventions can improve food safety knowledge and behaviors when closely aligned with specific needs of target groups. Identifying the needs of adolescents is important because they are under-studied and adolescence is an ideal time to establish life-long behaviors.

The purpose of this study was to estimate food-safety knowledge and behaviors of 7th grade students in East Tennessee and determine relationships between knowledge, behaviors, and specific demographic characteristics. A survey assessing food safety knowledge and behaviors was administered to 232 students in 12 schools through a weighted, stratified, random sample. A hierarchical model was used to obtain least squares means.

Results indicated significant disconnects between knowledge and reported food-handling behaviors. No statistical difference was found in food safety knowledge for any of the demographics except race, in that Asian/Pacific students scored lower ( $P = 0.0005$ ). Males ( $P = 0.0134$ ) and Asian/Pacific students ( $P = 0.0034$ ) reported riskier food-handling behaviors.

Handwashing and use of proper time-temperature conditions, as well as differences in behavior within gender and some ethnic groups, should be focal points in adolescent food safety education. With limited food handling experience and relatively little impact of demographic factors, dissemination of knowledge and development of safe behaviors through adolescent education may prove successful in improving consumer food safety.

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## INTRODUCTION

It has been estimated that more than 20% of foodborne illnesses may occur because of food-handling errors by consumers (17). Several studies have emphasized the importance of the consumer as the "final line of defense" in the prevention of foodborne illness because they comprise the final step in the food preparation process (9, 20, 30). Concern about the consumer's role in food protection has increased attention to food safety education. As a result, the Healthy People 2010 initiative, which reports that 71% of meals and 78% of snacks are prepared by consumers, has identified increasing the proportion of consumers who follow key food safety practices as one of its seven food safety objectives (8). This emphasis on improving consumer food safety practices has prompted considerable research in food safety education interventions focused on consumer knowledge and behaviors.

Researchers suggest that for effective food safety education and risk communication to encourage safe food-handling practices, behavioral differences between various subpopulations must be understood (15). Several studies have found that food-handling practices differ by gender, ethnicity, age, income, and other demographic characteristics (2, 13, 19). Overall, studies find that safer food practices are reported by women than men (4, 13, 14, 18). While results of differences among ethnic groups between studies have varied greatly, overall, research suggests that race may play some role in determining food safety knowledge and behaviors of consumers (17, 21, 24, 27). Several studies have reported an inverse relationship between safe food-handling behaviors and education, with the most highly educated consumers engaging in the riskiest behaviors, especially with regard to consumption of adequately cooked meats (13, 14, 19, 22, 24). Some researchers have observed the relationship of food safety knowledge, attitudes, and behaviors to socioeconomic status or income levels of consumers. Many studies have found that high-income adults (> \$50,000 annual household income) reported greater consumption of unsafe foods, less knowledge of hygiene, and greater likelihood of engaging in cross-contamination practices (13, 14, 19,

29). The effect of geographic location of residence on food-safety knowledge and behaviors has received little attention in research. Patil et al. (19) found that individuals residing in metropolitan areas or cities reported the highest consumption of raw or undercooked ground beef and that use of preventive cross-contamination practices was poorest in the rural mountain area. Other studies report that consumers from urban areas tend to have lower food safety knowledge scores than those from rural areas (1, 24).

The association of frequent food preparation and gender with safe practices suggests that food-handling skills may be acquired through factors related to training, experience preparing food, or maturation (25). Many studies found that unsafe practices were reported more often by adults 18 to 29 years of age, particularly with regard to implementation of preventive cross-contamination practices (2, 14, 19, 22). Interestingly, Altekruse et al. (2) reported that while safe practices did increase with age, knowledge of food hygiene practices did not. The disparity between knowledge and self-reported practices may relate to food-handling experience, which may be lacking in young adults (25).

Throughout food safety knowledge and behavior research, no demographic group consistently outperformed another in every safe-handling practice. Overall, food safety behavior differences among gender, race, socioeconomic level, and other demographic characteristics do exist and can be helpful in tailoring education and risk communication efforts to target groups.

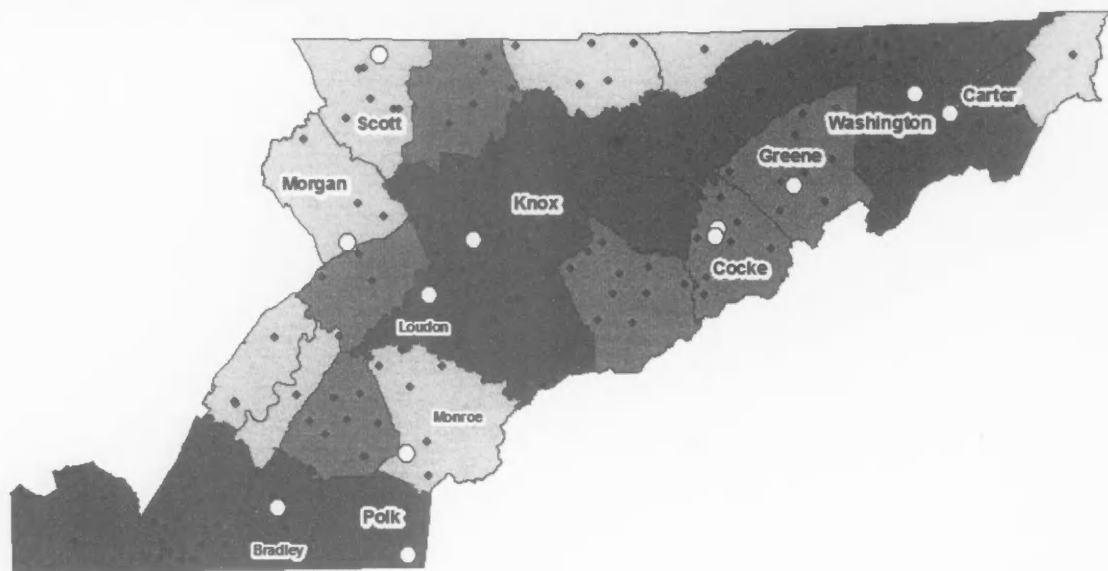
Recently, studies have begun to focus on young adults, mostly college or high school students. Many of the same gaps in knowledge and disconnects between behaviors that are found with adult consumers in the areas of good hygiene, adequate cooking, and preventive cross-contamination practices were found among young consumers (5, 10, 26). These studies concluded that some exposure to food safety or experience in food-handling practices may lead to increased safer behaviors. Also, research with college students reveals that some of the differences among demographic groups with adult consumers have already been established by the college years.

Despite a consensus in the public health community that learning safe food-handling habits at an early age benefits health in the short and long term, many adolescents (fifth to eighth grade) have not received adequate education on the topic of food safety (3, 28). Some researchers contend that with increased contamination of food with pathogenic microbes (5) and changes in eating habits of Americans, today's youth are more at risk of experiencing a foodborne illness than previous generations (7). Adolescents are targeted for food safety educational research because many have begun or will soon begin preparing meals or working in food service, and they are currently an understudied population in food safety knowledge and behaviors. Richards et al. (21) suggest that middle school is an ideal time to teach food safety, because adolescents are in the process of establishing life-long behaviors and, therefore, are more likely to synthesize new food safety knowledge in a way that will lead to the development of safer life-long behaviors.

Effective educational interventions for adolescents can lead to improved food safety habits, but the success of these interventions depends upon alignment of educational strategies with specific needs of the targeted demographic group. Research suggests that without baseline data, it is difficult to develop and implement effective education efforts (6). Constructing a baseline of food safety knowledge, attitudes, and behaviors for various demographic groups is vital for determining the specific educational strategies that will motivate adolescents to practice safer food-handling.

The objectives of this study were to: (1) develop a rigorous statistical sampling method to allow for the collection of data on the food safety knowledge, attitudes, and behaviors of seventh grade students in East Tennessee; (2) analyze that data to construct a baseline and identify gaps in food-safety knowledge, attitudes, and behaviors; and (3) ascertain the relationship of variables such as geographic location, socioeconomic status (SES), gender, and food-handling experience with food-safety knowledge, attitudes, and behaviors.

FIGURE 1.



## Legend

- Participating Schools
- All Schools Containing 7th Grade
- Metropolitan Counties
- Micropolitan Counties
- Other Counties

## MATERIALS AND METHODS

### Study design

Participants in the study were seventh grade students attending East Tennessee schools chosen through a proportionally weighted, random sample stratified by US Census Bureau Standard Metropolitan Areas (SMA) classification of the county in which the school is located. The 2006 SMA Data Book describes the general concept of a Metropolitan or Micropolitan statistical area as "a core area containing a substantial population nucleus, together with adjacent communities having a high degree of economic and social integration with that core" (27). Counties that were not defined by this method were assigned the classification "Other". Within the Metropolitan area classification, counties were further stratified by the principal city (Knoxville, Chattanooga, or Tri-Cities) to ensure a proportionally weighted sample according to percentage of students in that area. The random number generator

command in Microsoft Excel was used to randomly select a total of 15 schools (7 Metropolitan, 4 Micropolitan, and 4 schools from the Other SMA) from the possible 193 East Tennessee schools that housed a seventh grade to contact for participation. A minimum of three schools per SMA was required to ensure replication within the sample. The rigor of this methodology allowed the results to be generalized to the entire seventh grade population in East Tennessee (24,701 students).

### Questionnaire development

The study instrument, administered as a 40 item questionnaire assessing food-safety knowledge, attitudes and behaviors, was adapted from an instrument developed and validated as part of a larger research project (21). This survey consisted of 20 multiple-choice knowledge questions and 11 true/false and nine Likert-scale (1- Never, 4-Always) questions assessing attitudes and behavior. Assessment items were written to measure specific food-safety

learning objectives that were appropriate for adolescent learners. These learning objectives were identified by the Tennessee Food Safety Task Force and a panel of food safety and microbiology experts from the University of Tennessee's Department of Food Science and Technology. The instrument was evaluated by an independent testing expert and field tested for reliability and validity ( $\alpha = 0.868$ ) prior to its use by a group of similar seventh grade students at a middle school not selected in this study. A five item demographic questionnaire assessing gender, race, and food-handling experience was administered concurrently. (See Appendix 1 for a copy of the assessment.)

### Participation and data collection

Access to study participants was gained through the support and cooperation of administrators and teachers of participating schools. Approval from the Institutional Review Board (IRB) for research with human subjects was

## APPENDIX I

**Directions:** Read each of the following statements or questions below and choose the BEST answer from the given. Fill in the matching bubble on your answer sheet.

- 1) Which of the following is NOT true about bacteria?
  - a) They are microscopic.
  - b) They are made up of only one cell.
  - c) They can be found on most surfaces.
  - d) All bacteria make you sick.
- 2) When bacteria grow they:
  - a) Grow in size from an infant to adult.
  - b) Grow in number, not in size.
  - c) Require more and more food to grow larger.
  - d) Eventually get too big and die.
- 3) How do bacteria get the nutrients they need to survive?
  - a) Some make their own energy from the sun.
  - b) Some scavenge from environment around them.
  - c) Some attach to other living things.
  - d) All of these are true.
- 4) A pathogen is:
  - a) A bacterium that helps in digestion.
  - b) A bacterium used to make pepperoni.
  - c) A bacterium that can make you sick.
  - d) A bacterium used to make medicines.
- 5) All of the following are pathogens EXCEPT:
  - a) *Salmonella*
  - b) *Lactobacillus*
  - c) *E. coli* O157:H7
  - d) *Listeria*
- 6) Which of the following is NOT made using helpful bacteria?
  - a) Pickles
  - b) Eggs
  - c) Pepperoni
  - d) Sauerkraut
- 7) The MOST IMPORTANT thing you can do to keep from getting sick from a pathogen is to:
  - a) Refrigerate leftovers.
  - b) Wash your hands.
  - c) Frequently wipe kitchen surfaces.
  - d) Use a hand sanitizer.
- 8) Which is the BEST example of cross-contamination?
  - a) Not reheating food properly.
  - b) Leaving food out at room temperature for too long.
  - c) Using the same knife to cut raw chicken and vegetables.
  - d) None of the above.
- 9) Leftover foods should be refrigerated within:
  - a) 30 minutes
  - b) 1 hour
  - c) 2 hours
  - d) 3 hours
- 10) Bacteria grow most rapidly in temperatures of:
  - a) At zero degrees.
  - b) Below 40 degrees.
  - c) Above 140 degrees.
  - d) Between 40–140 degrees.
- 11) The safest way to tell if a hamburger is cooked to the proper temperature is to:
  - a) Use a food thermometer.
  - b) Check to see if the inside is still pink.
  - c) Burn the outside of the burger.
  - d) None of the above.
- 12) Which of the following is a possible outcome of not handling food properly?
  - a) Getting sick and requiring medical attention.
  - b) Not getting sick at all.
  - c) Getting sick for a few days and then feeling better.
  - d) All of these are possible outcomes.
- 13) It is okay to eat raw cookie dough:
  - a) Anytime. Raw eggs won't hurt you.
  - b) Only if the cookie dough is store bought.
  - c) Only if it is homemade dough.
  - d) Never. Raw eggs in the dough put you at risk for salmonellosis.

- 14) The safest way to defrost frozen meat is to:  
 a) Set it out on the counter.                      b) Place it in the refrigerator.  
 c) Cook it while it is frozen.                      d) None of the above.
- 15) To make sure that your ground beef is safe to eat, it should be cooked to an internal temperature of  
 a) 160°F    b) 180°F  
 c) 200°F    d) 212°F
- 16) A foodborne illness is  
 a) Any illness humans get from food.                      b) An illness you are born with.  
 c) Only preventable with a vaccine.                      d) An illness that cannot be passed from one person to another.
- 17) Which of the following can cause a foodborne illness?  
 a) Bacteria    b) Viruses  
 c) Parasites    d) All of the above
- 18) Which of the following is NOT a common symptom of foodborne illnesses?  
 a) Chest pains    b) Diarrhea  
 c) Vomiting    d) Headache
- 19) You should wash your hands  
 a) After using the bathroom.                      b) Before handling food.  
 c) More frequently when someone around you is sick.                      d) All of these are true.
- 20) Which of the following does NOT need to be done in order to avoid foodborne illnesses?  
 a) Make sure that all food is thoroughly cooked.                      b) Throw away all leftovers.  
 c) Refrigerate all leftovers immediately.                      d) All of these are true.

For the following statements:

Fill in Bubble "A" if the statement is **TRUE**.

TRUE FALSE

Fill in Bubble "B" if the statement is **FALSE**.

- |  |   |   |
|--|---|---|
| 21) It is possible to wash my hands thoroughly using only water.   | A | B |
| 22) When preparing food, it is okay to use the same surfaces (cutting board, counter top) and utensils for meats and vegetables.                       | A | B |
| 23) It is okay to eat pizza that has been sitting out on the counter all night as long as I warm it up first.  | A | B |
| 24) Most people go to the doctor when they get food poisoning.   | A | B |
| 25) More people are hospitalized each year with food poisoning than with the flu.  | A | B |
| 26) Almost all food-poisonings are preventable.  | A | B |
| 27) If I clean a surface with soap and water, it will kill all the bacteria.   | A | B |
| 28) Bacteria cannot grow in food stored in a refrigerator.   | A | B |
| 29) There may be bacteria in my food that can make me sick if my food is not handled correctly.  | A | B |
| 30) All bacteria can make me sick.   | A | B |
| 31) To prevent cross-contamination, it is important to keep raw meat, poultry, and seafood away from other foods in the grocery cart and refrigerator. | A | B |

For the following statements, fill in the bubble of the choice that applies **most** often.

**A** – The statement is *never* true.

**B** – The statement is *rarely* true.

**C** – The statement is *sometimes* true.

**D** – The statement is *always* true.

- |   | Never | Rarely | Sometimes | Always |
|---|-------|--------|-----------|--------|
| 32) I feel that I know how to correctly handle my food so that I do not become sick.                      | A     | B      | C         | D      |
| 33) When preparing food, I carefully follow temperature and time directions on the food packaging labels. | A     | B      | C         | D      |

- 34) If necessary, I could properly handle a variety of meats and vegetables to prepare a safe meal for my family. A B C D
- 35) I wash my hands before preparing or eating food. A B C D
- 36) When I see an adult handling food improperly, I point out her or his mistakes. A B C D
- 37) I can identify foods that have a higher risk of making me sick. A B C D
- 38) I use hand sanitizer to clean my hands. A B C D
- 39) I wash my hands after each time I use the restroom. A B C D
- 40) I can recognize the most common symptoms of food poisoning. A B C D
- 41) What is your gender?  
a) Female b) Male
- 42) What is your race?  
a) African American b) Asian/Pacific  
c) Caucasian d) Hispanic  
e) Native American
- 43) What types of food do you prepare?  
a) I don't prepare any type of food b) Snacks only  
c) Snacks and meals
- 44) How many meals or snacks do you prepare in a week?  
a) 0 to 5 b) 6 to 10  
c) More than 10 meals or snacks
- 45) How many times does your family eat at a restaurant or fast food during a week?  
a) More than 10 times b) 4 to 10  
c) 0 to 3

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Thank you for participating in this Survey!

also obtained. Informed consent/assent letters were given to students and their parents or guardians to determine participation. All surveys were prepared by the investigator and shipped to the sites to reduce the likelihood of misadministration. Teachers at the test site collected all consent forms from participating students in their classrooms, administered the 20–25 minute survey, and shipped the completed surveys directly to the investigator. As incentives for participation, students received a pencil and coupon donated by a local food company and, in some cases, extra credit.

#### Data analyses

Surveys were scored by the University of Tennessee Office of Information and Technology Test Scanning and Scoring department. Individual student assessment scores were considered outliers and removed from the data set under the following conditions: (1) the entire assessment was not finished, or

(2) student responses were “offline” on the scantron sheet, giving too few or too many answers on the answer form.

Item analyses by question were completed by aggregating and sorting data in Microsoft Excel to describe the participants’ responses and determine baseline knowledge and attitudes/behaviors for food-safety measures in this survey. All statistical analyses were completed using SAS (version 9.1, Cary, NC). The study participants were characterized by gender, race, socioeconomic status (SES), geographic location of residence, and food-handling experience, using the frequency procedure. Contingency table analysis with the exact test was used to determine significant differences in food-safety knowledge or attitudes/behaviors between genders.

Mean knowledge scores were obtained by totaling the 20 knowledge questions as correct, while attitude/behavior mean scores were determined

by adding the 11 true/false and nine Likert scale (never, rarely, sometimes, always) behaviors for each subject. The knowledge and true/false questions were scored 1 point for a correct answer and 0 points for an incorrect answer. The Likert scale questions were given 1 point for never, 2 points for rarely, 3 points for sometimes, and 4 points for always. Total knowledge and attitudes and behavior scores were normalized to 100, with a possible range of scores of 0 to 100. A hierarchical model with geographic location (SMA) and SES at the school level and gender and race at the student level was used to obtain least squares means to measure the relationships of these demographic variables with food-safety knowledge or attitudes/behaviors total scores of adolescents in this study. Differences of least squares means by the demographic variables were obtained using Tukey-Kramer’s mean separation adjustment for significance (23).

**TABLE 1. Demographic characteristics of participating schools in East Tennessee**

School	District <sup>a</sup>	Geographic area <sup>b</sup>	SES level <sup>c</sup>	Sample size <sup>d</sup>
1	Bradley	Metro-Chattanooga	39.3	32
2	Polk	Metro-Chattanooga	66.0	14
3	Washington	Metro-Tri-Cities	57.0	38
4	Carter	Metro-Tri-Cities	57.6	10
5	Lenoir City	Metro-Knoxville	63.3	10
6	Knox	Metro-Knoxville	25.3	36
7	Newport	Micropolitan	41.1	13
8	Greene	Micropolitan	43.8	11
9	Cocke	Micropolitan	99.3	26
10	Scott	Other	97.8	8
11	Morgan	Other	48.6	20
12	Monroe	Other	69.8	16

<sup>a</sup>District is designated by the Tennessee Department of Education.

<sup>b</sup>Geographic area is based on US Census Bureau Standard Metropolitan Areas classification.

<sup>c</sup>SES (socioeconomic status) level represents the percentage of students in that school who are economically disadvantaged (i.e., eligible for the free and reduced lunch program).

<sup>d</sup>Sample size refers to the number of students in that school who participated in the food safety survey and submitted consent forms.

## RESULTS AND DISCUSSION

Twelve of the 15 randomly selected schools in East Tennessee agreed to participate. The SMA classification (Metropolitan, Micropolitan, and Other) for counties in East Tennessee, as well as the locations of the participating schools, are displayed in Fig. 1. One school from each of the SMA classification areas chose not to participate for one or more of the following reasons: participation required both parental and student consent, administrators and/or teachers did not think that time from the regular curriculum could be spared, or the school or school system did not allow data to be collected from students. The number of participating schools for each SMA was proportionally weighted to the population and included: six schools from the Metropolitan areas; with two from each core city; three schools from the Micropolitan areas; and three schools from the Other area classification (Table 1). A total of 232 seventh grade students returned consent forms

and completed the survey. The sample sizes for each school ranged from 8 to 38 students (Table 1). The SES level, as determined by the Department of Education free and reduced lunch program, for each school ranged from 25.3 to 99.3 percent, representing the percentage of students in that school that are economically disadvantaged (Table 1). Seven of the 12 participating schools in this survey had SES levels greater than the 50% level that determines federal funding for assistance programs.

In describing the demographic characteristics at the student level, most participants in this study were female (63.2%) and Caucasian (74.5%) (Table 2). Studies surveying food safety knowledge of college students have described similar populations, with females comprising 62 to 65% of respondents (5, 26). Some food-safety surveys with adult consumers report the percentage of respondents who are female to be as high as 80 to 85% (14, 16, 22). In many surveys, both with college students and adults, Caucasians make

up the majority (greater than 60%) of respondents.

## Food-handling experience

The food-handling experience of adolescents in this study and the mean knowledge and attitudes/behaviors scores and differences by response are described in Table 3. The majority (62.61%) of adolescents report preparing both meals and snacks, with a significantly higher proportion ( $P = 0.0016$ ) of females reporting meals and snacks as the primary types of food they prepare, compared with snacks only or no food preparation. The types of food prepared had an effect on the overall attitudes/behaviors scores, with students who prepared both meals and snacks reporting significantly safer attitudes/behaviors than students who prepared no foods or snacks only; however, knowledge was not significantly different by types of food prepared. Most (40.87%) prepare 0 to 5 meals or snacks

**TABLE 2. Demographic characteristics of participating seventh graders in East Tennessee**

Characteristic	# Students (%)
Gender (n = 231)	
Female	146 (63.2)
Male	78 (34.8)
Race (n = 228)	
African American	15 (6.6)
Asian/Pacific	6 (2.6)
Caucasian	170 (74.5)
Hispanic	15 (6.6)
Native American	23 (10.1)
Geographic area <sup>a</sup> (n = 232)	
Metropolitan	138 (59.5)
Micropolitan	49 (21.1)
Other	45 (19.4)

<sup>a</sup>Geographic area is based on US Census Bureau Standard Metropolitan Areas classification.

in one week. There was no significant relationship between the total knowledge or attitudes/behaviors scores of the students or differences between genders for any response to the number of meals or snacks prepared. Students reported eating at a restaurant or fast food with their family 0 to 3 times a week, with no response difference between genders. Students who reported eating out with their family 0 to 3 or 4 to 10 times per week demonstrated significantly greater food-safety knowledge than students who ate out more than 10 times a week, but attitudes/behaviors were not significantly different among levels of eating out.

In their study with 178 seventh and eighth grade students, Haapala and Probart (11) also found that the majority of students (52%) prepare meals or snacks, with females and males participating equally in food preparation. Byrd-Bredbenner et al. (5) reported that 84% of college students (mean age 19.9 ± 1.9) prepared at least one meal every week. These results suggest that adolescents are beginning to prepare foods and, while the frequency of food preparation will increase, food-handling

experience is limited among young consumers, even at the college level.

### Knowledge measures

The adolescents in this study (n = 231) demonstrated only a fair level of food-safety knowledge, answering on average 48% of the knowledge questions correctly. Richards et al. (21) similarly found that seventh grade students (n = 234) from five schools in Tennessee and North Carolina demonstrated only 51% correct food safety knowledge, while Haapala and Probart (11) found that seventh and eighth grade students (n = 178) had a slightly higher total, with 72% correct knowledge. It should be noted that the instrument in this study was a modified version of the survey used by Richards et al. (21); thus knowledge differences reported by Haapala and Probart (11) could be due to differences in the instrument, not in actual student knowledge.

The knowledge of adolescents in the current study on key food safety issues is described in Fig. 2 and Fig. 3. The adolescents demonstrated high levels (63–79%) of knowledge in the importance and frequency of proper

hygiene. The majority of participants (83%) overestimated the temperatures needed to safely cook ground beef, but many (67%) incorrectly chose color, over the use of a thermometer, as the best indicator of “doneness” of a hamburger. Awareness of cooling practices for leftover foods was high (88%), but knowledge of proper meat defrosting methods was low with only 26% correctly answering that thawing in the refrigerator is the safest method. The adolescents’ understanding of preventive cross-contamination practices, like separating foods and using different or clean utensils between foods, was fair with 57–62% correctly answering. Participants’ knowledge of foodborne pathogens was low, with 38% not correctly recognizing *E. coli* O157:H7 as a pathogen that could cause foodborne illness.

Haapala and Probart (11) reported similar results with adolescents demonstrating high levels of knowledge in proper hygiene (85%) and cooling practices (89%). However, their study reported that 63% of adolescents correctly identified a thermometer reading as the safest indicator of doneness of meat. This finding greatly differs from the current study, which found that 67% of adolescents identified color as the best indicator of doneness. The inconsistency in these findings may be due to the fact that the question regarding safest method for determining meat doneness in the Haapala and Probart study was a true/false item, while the survey question in our study offered multiple choice answers.

### Attitude/Behavior measures

Student perceptions of risk of foodborne illness were high, while self efficacy and personal responsibility toward food safety were fairly low (Fig. 4). Less than half of students felt they could affect their risk of foodborne illness by correctly handling foods, identifying higher risk foods, or recognizing common symptoms. Adolescents in the Haapala and Probart (11) study also exhibited high perceptions toward the risk and severity of foodborne illness and low self efficacy. College students were found to have higher (82%) self-efficacy scores (5). With adult consum-

**TABLE 3. Food-handling experience of participating East Tennessee Seventh graders**

	Total number (%)	Female number (%)	Male number (%)	Total Knowledge <sup>b</sup> mean ± SE <sup>a</sup>	Total Attitudes/Behaviors <sup>b</sup> mean ± SE <sup>a</sup>
<b>Types of food prepared<sup>c</sup> (n = 230)</b>					
Prepare no foods	30 (13.04)	14 (6.09)	16 (6.96)	42.1 ± 3.0 <sup>a</sup>	59.6 ± 2.4 <sup>b</sup>
Snacks only	54 (23.48)	27 (11.74)	27 (11.74)	50.0 ± 2.3 <sup>a</sup>	69.0 ± 1.9 <sup>b</sup>
Meals and snacks <sup>d</sup>	144 (62.61)	105 (45.65)	39 (16.96)	49.9 ± 1.6 <sup>a</sup>	73.4 ± 1.4 <sup>a</sup>
No answer	2 (0.87)	1 (0.44)	1 (0.44)	38.0 ± 3.8 <sup>a</sup>	60.9 ± 6.0 <sup>ab</sup>
<b>Number of meals or snacks prepared<sup>e</sup> (n = 230)</b>					
0 to 5	94 (40.87)	59 (25.65)	36 (15.65)	48.4 ± 1.8 <sup>a</sup>	69.2 ± 1.4 <sup>a</sup>
6 to 10*	83 (36.09)	56 (24.35)	27 (11.74)	49.0 ± 4.1 <sup>a</sup>	72.3 ± 1.5 <sup>a</sup>
More than 10	50 (21.74)	32 (13.91)	18 (7.83)	50.8 ± 3.2 <sup>a</sup>	70.6 ± 6.5 <sup>a</sup>
No answer	3 (1.30)	1 (0.44)	2 (0.87)	25.6 ± 7.8 <sup>b</sup>	57.7 ± 2.0 <sup>a</sup>
<b>Frequency of eating out<sup>f</sup> (n = 230)</b>					
More than 10 times	10 (4.35)	5 (2.17)	5 (2.17)	34.8 ± 5.1 <sup>b</sup>	61.8 ± 4.2 <sup>ab</sup>
4 to 10	65 (28.26)	43 (18.70)	22 (9.57)	48.2 ± 2.1 <sup>a</sup>	70.2 ± 1.6 <sup>a</sup>
0 to 3	150 (65.24)	97 (42.17)	53 (23.04)	50.6 ± 1.5 <sup>a</sup>	71.8 ± 1.1 <sup>a</sup>
No answer	5 (2.17)	2 (0.87)	3 (1.30)	35.2 ± 5.8 <sup>ab</sup>	56.9 ± 4.8 <sup>b</sup>

<sup>a</sup>Mean separation based on Tukey-Kramer ( $P < 0.05$ ) adjustment method. Means within responses to food-handling experience questions followed by the same letter are not significantly different.

<sup>b</sup>Knowledge and Attitudes/Behaviors scores normalized to 100, with possible range of scores 0 to 100.

<sup>c</sup>Significant difference between female and male response ( $P = 0.0016$ ).

<sup>d</sup>Large deviation and cell Chi-square values indicate specific response differs by gender.

<sup>e</sup>Number of meals or snacks prepared by the student in one week ( $P = 0.6130$ ).

<sup>f</sup>Frequency the student and their family eats out (i.e., at a restaurant or fast food) in one week ( $P = 0.6058$ ).

ers, Redmond and Griffith (22) reported that while perceived threat or risk of foodborne illness was low, self efficacy was high, with 66% of consumers thinking they had full or nearly full control of their food safety and 84% perceiving their personal responsibility for food safety to be high. Overall, these results suggest that a high level of confidence in ability to handle food safely increases with age and food-handling experience.

Reported safe food-handling behaviors by adolescents in this study were high (i.e., greater than 50%) for several behavior measures (Fig. 4); however, disconnects between knowledge and

the reported behaviors in hygiene and temperature practices were observed. In this study, results showed that 63% knew the importance of hand-washing, but only 51% reported 'always' washing their hands before eating or preparing food; 79% demonstrated knowledge of the importance of washing their hands after using the restroom, but only 59% reported 'always' doing so; 50% reported 'always' following temperature directions, but 85% did not know how to determine if a hamburger was cooked properly, and 74% did not know how to safely thaw meat. These results support the findings of other research with adolescents (11), college students (5, 10),

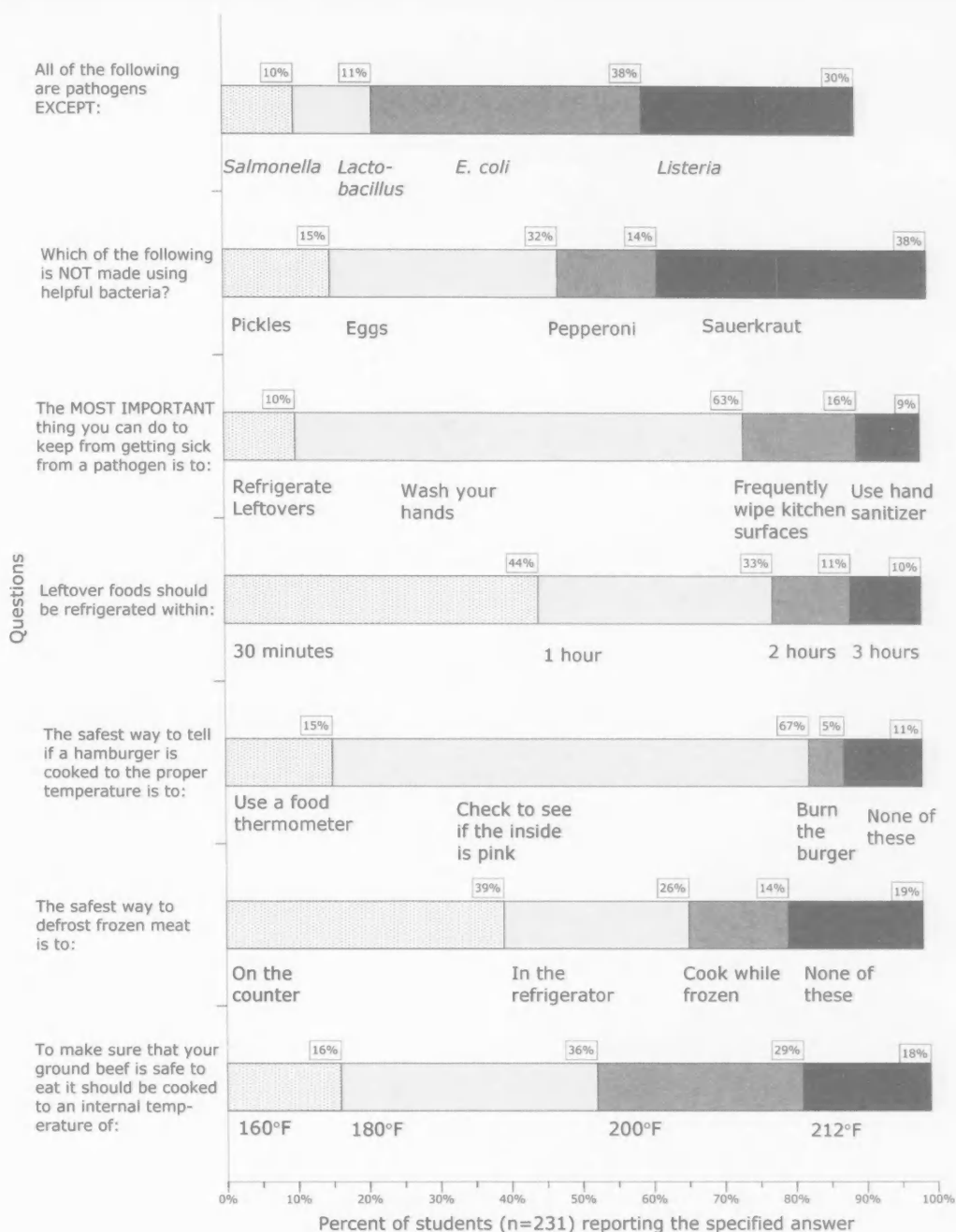
and even adults (2, 19, 20), in which their reported behaviors disagreed with their actual knowledge.

#### Knowledge and attitudes/ behaviors by gender

Responses to some knowledge questions differed significantly by gender (Table 4). However, no overall significant difference ( $P = 0.0805$ ) was found between genders in total food safety knowledge, with mean scores ranging from 38 to 42% correct (Table 5). Only the differences in responses to questions regarding hygiene were highly



FIGURE 2.



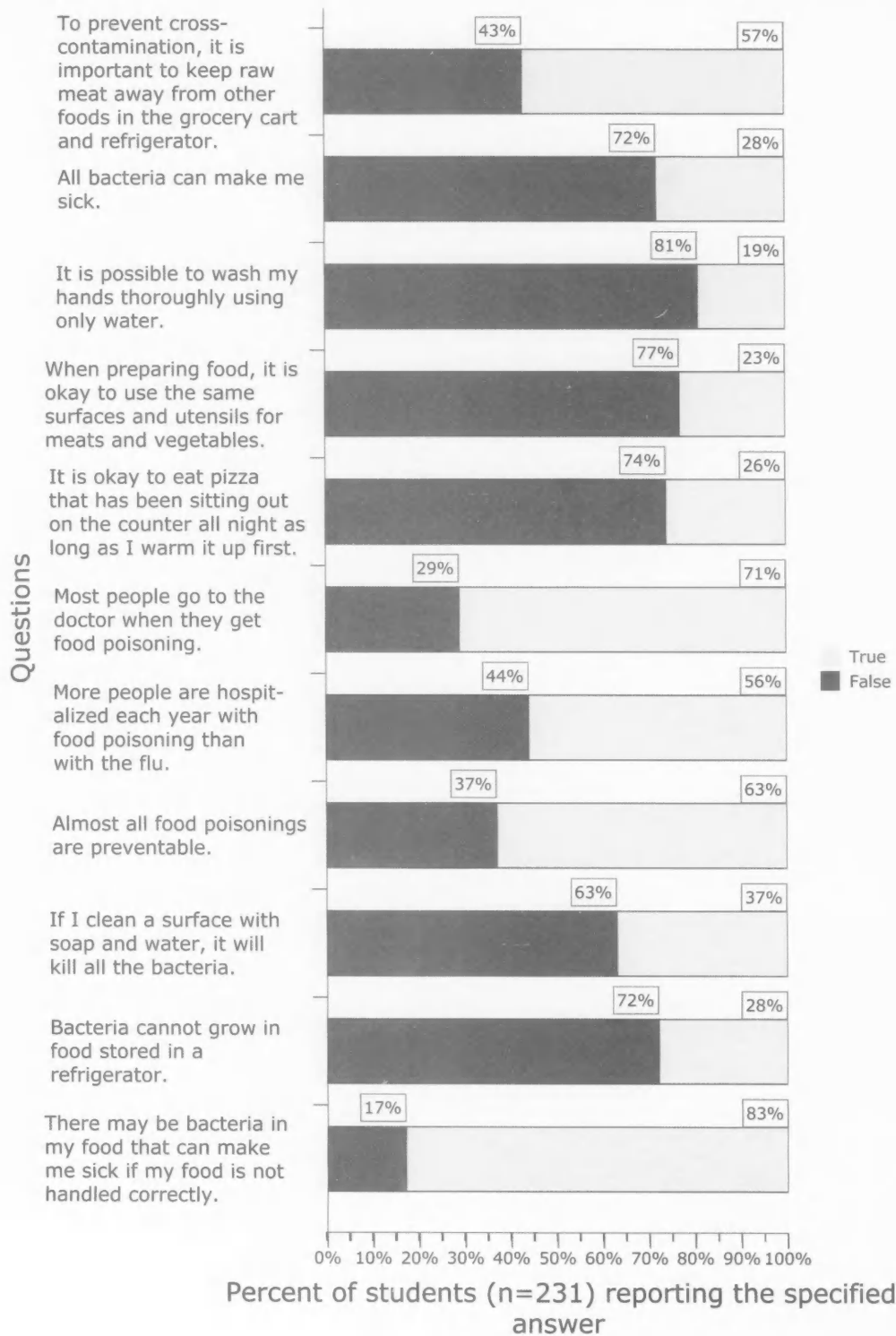
significant ( $P = 0.0006$ ), with 55% of females and only 23% of males responding correctly. There was a significant difference ( $P = 0.0134$ ) between genders in overall scores for attitudes/behaviors toward food safety (Table 4). Significant differences in responses to questions

relating to self efficacy and proper hygiene between genders was observed (Table 3). Again, the difference between genders was highly significant for hygiene practices, with females reporting higher frequency of washing hands after using the restroom (41%) and using

hand sanitizer (35%) as compared to male reported behaviors, 18 and 14%, respectively.

Many studies of college students and adults have reported that females demonstrate higher food-safety

FIGURE 3.



**TABLE 4. Significant differences<sup>a</sup> in East Tennessee adolescent knowledge and attitudes/ behaviors of food safety by gender**

Food safety issue	% Answering knowledge question correctly or responding to attitudes/behavior statements 'always' or 'sometimes'		
	Female	Male	P - value
<b>Knowledge</b>			
Q. When should hands be washed? A. after using the bathroom, before handling food, and more frequently when someone is sick	55.41	23.81	0.0006
Q. What is the safest way to defrost meat? A. in the refrigerator	14.29	12.55	0.0446
Q. A pathogen is: A. a bacterium that can make you sick	42.42	18.18	0.0247
Q. It is okay to eat pizza that has been sitting out on the counter all night? A. False	51.08	23.81	0.0274
Q. Bacteria cannot grow in food stored in the refrigerator A. False	50.65	22.51	0.0086
<b>Attitudes/Behaviors</b>			
Q. I feel that I know how to correctly handle my food so that I do not become sick A. Sometimes	35.93	13.42	0.0397
Q. I could properly handle food to prepare a safe meal for my family A. Always	26.84	9.09	0.0417
Q. I use hand sanitizer to clean my hands A. Sometimes	34.63	13.85	0.0276
Q. I wash my hands after each time I used the restroom A. Always	41.13	18.18	0.0288

<sup>a</sup>Significant differences obtained from the exact test in contingency table analysis (n = 231).

knowledge and reported behaviors than males (2, 5, 19, 22). However, Haapala and Probart (11) also found, as in the current study, no overall significant difference in food safety knowledge between genders in adolescents. Their study suggested that with increasing age, females tend to get more practice

in food-handling and therefore score higher than males in studies of adults. Others have also suggested that food-safety knowledge may increase with age and experience (2, 14, 19, 25). The findings that reported attitudes and behaviors differ between genders in the current study may be explained by the

higher proportion of females preparing both meals and snacks, and thus receiving more experience in handling a variety of foods. However, the frequency of food preparation or handling experience for adolescents in this study was low, with no difference between genders. The overall lack of experience with food-

**TABLE 5. Least squares means<sup>a</sup> for knowledge and attitudes/behaviors of adolescents by gender, race, and geographic area**

Effect	Knowledge <sup>b</sup> estimate ± SE <sup>a</sup>	Attitudes/Behaviors <sup>b</sup> estimate ± SE <sup>a</sup>
Gender <sup>c</sup>		
Female	42.0 ± 2.1 <sup>a</sup>	66.2 ± 18.7 <sup>a</sup>
Male	38.4 ± 2.2 <sup>a</sup>	63.3 ± 1.8 <sup>b</sup>
Race <sup>d</sup>		
African American	43.2 ± 3.8 <sup>ab</sup>	63.8 ± 3.1 <sup>ab</sup>
Asian/Pacific	26.8 ± 6.0 <sup>b</sup>	54.5 ± 5.1 <sup>a</sup>
Caucasian	49.5 ± 1.3 <sup>a</sup>	70.2 ± 1.1 <sup>b</sup>
Hispanic	41.5 ± 4.1 <sup>ab</sup>	67.9 ± 3.2 <sup>ab</sup>
Native American	40.0 ± 3.2 <sup>b</sup>	65.1 ± 2.4 <sup>ab</sup>
Geographic area <sup>e</sup>		
Metropolitan	43.3 ± 1.9 <sup>a</sup>	68.4 ± 1.6 <sup>a</sup>
Micropolitan	36.6 ± 2.7 <sup>a</sup>	62.4 ± 2.3 <sup>a</sup>
Other	40.7 ± 2.8 <sup>a</sup>	62.3 ± 2.2 <sup>a</sup>

<sup>a</sup>Mean separation based on Tukey-Kramer ( $P < 0.05$ ) adjustment method. Means within gender, race, or geographic area followed by the same letter are not significantly different.

<sup>b</sup>Knowledge and Attitudes/Behaviors scores normalized to 100, with possible range of scores 0 to 100. SE = standard error ( $n = 231$ ).

<sup>c</sup>Gender fixed effect test: knowledge  $P = 0.0805$ ; attitudes/behaviors  $P = 0.0134$ .

<sup>d</sup>Race fixed effect test: knowledge  $P = 0.0002$ ; attitudes/behaviors  $P = 0.0034$ .

<sup>e</sup>Geographic area fixed effect test: knowledge  $P = 0.866$ ; attitudes/behaviors  $P = 0.0280$ .

safety issues among adolescents may explain the lack of difference between genders in food-safety knowledge.

#### Association with demographic variables

The socioeconomic status variable was found to be confounded with other variables, and thus was not included in the model. Geographic area (i.e., location of residence) was not significant ( $P > 0.05$ ) in determining food-safety knowledge or attitude/behavior of adolescents (Table 4). The association between geographic location of residence and food safety knowledge and behaviors has received little attention in research. Patil et al. (19) found that use of preventive cross-contamination prac-

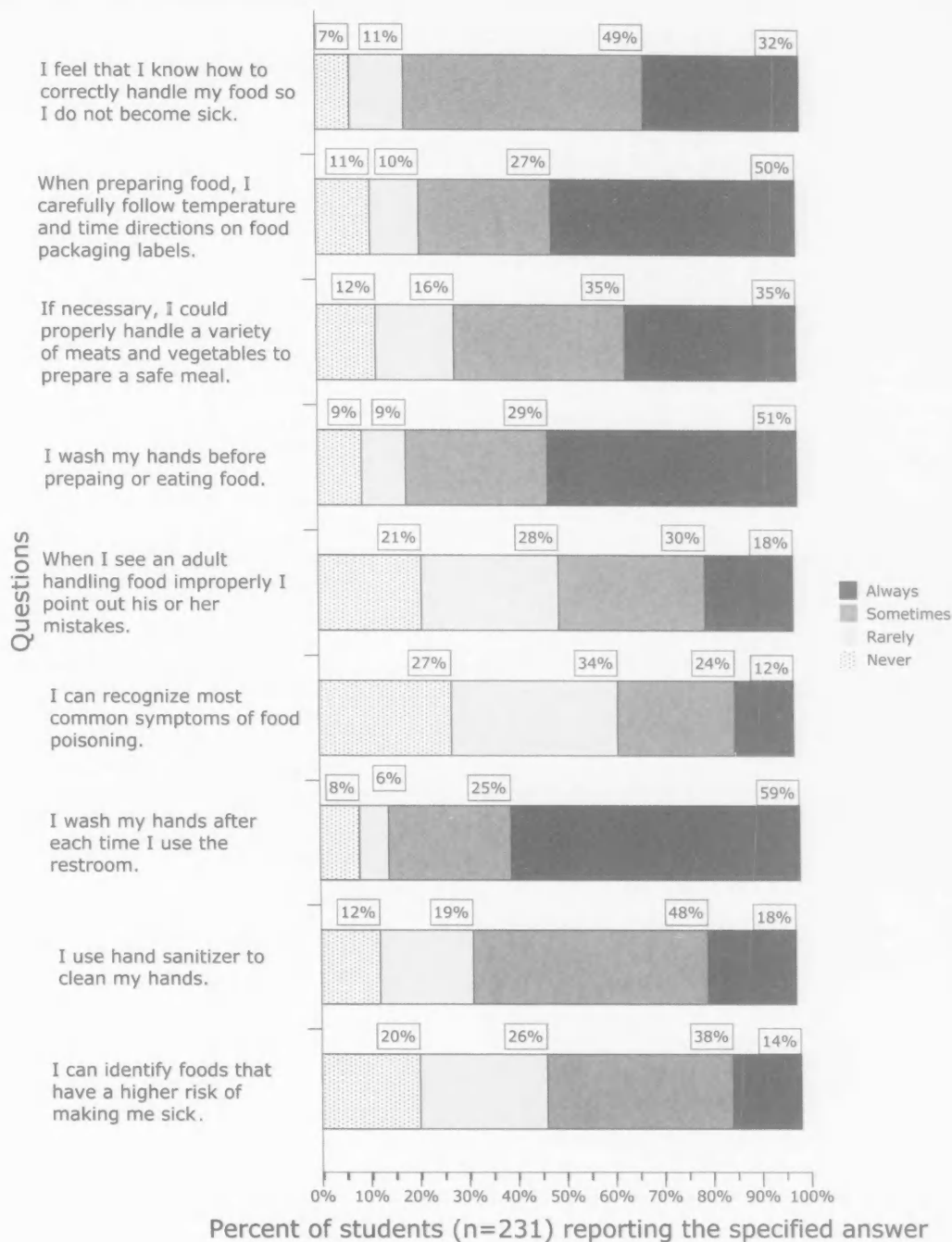
tices was poorest in the rural mountain area. Other studies report that consumers from urban areas tend to have lower food safety knowledge scores than those from rural areas (1, 27). The results from the current study suggest that any association between geographic location of residence and food-safety knowledge or behaviors are yet to be established in adolescents.

Significant differences were found with race for both knowledge ( $P = 0.0002$ ) and attitudes/behaviors ( $P = 0.0034$ ) (Table 2). Differences of least squares means were highly significant for both knowledge ( $P = 0.0021$ ) and attitudes/behaviors ( $P = 0.0189$ ) between Asian/Pacific and Caucasian students, with Caucasian students scoring higher. There was also a significant difference between the knowledge scores of Cauca-

sian and Native American students ( $P = 0.0363$ ), again with Caucasian students scoring higher. No significant differences were found between other ethnic groups.

Few studies with adolescents or college students have investigated and reported the relationship of race on food safety knowledge or attitudes and behaviors. Meer and Misner (16) found that Caucasian adults scored significantly higher ( $P < 0.001$ ) in food-safety knowledge than Hispanics, but no significant differences were found among other ethnic groups. Likewise, a FoodNet survey from 1996 to 1997 of 7,493 consumers found that Hispanics were more likely than other ethnic groups to engage in fewer safe food-handling behaviors, such as washing hands and cutting boards after handling raw meat (24).

FIGURE 4.



However, Patil et al. (19) found that the difference in good hygiene between Caucasians and Hispanics was not significant, but that African Americans and Asians reported significantly higher use

of good hygiene than Caucasians or Hispanics (19). The results from the current study indicated that Caucasian students score significantly higher in food safety knowledge measures and

report safer behaviors than Asian/Pacific students. However, it should be noted that the Asian/Pacific student population was very small (less than 10 students) and 2 students of this

ethnicity were removed from the sample as outliers because their questionnaires were not completed. It is possible that a significant language barrier existed for some Asian/Pacific students, thus skewing results. However, the finding from this study that Caucasian students score higher in food-safety knowledge and report safer attitudes and behaviors supports the findings of several studies with adults (16, 19, 24).

## CONCLUSIONS

While there have been many studies on the topics of food-safety knowledge, attitudes, and behaviors, very few have focused on adolescents. This study aids in constructing a baseline of food safety knowledge, attitudes, and behaviors for various demographic groups that is vital for determining the specific educational strategies that will motivate adolescents to practice safer food-handling. Overall, the adolescents in this study have less than optimal levels of food-safety knowledge and safe food-handling behaviors. Students' reported behaviors often disagreed with their valid knowledge, especially their knowledge of personal hygiene and cooking practices. Many studies have reported that knowledge may not definitively determine behaviors, so emphasis must be placed on not only increasing knowledge, but encouraging and empowering adolescents to change their behaviors. Engaging students in age-specific and hands-on activities that have real-world applications of food safety in the school setting will reinforce the importance of these concepts in students' daily lives.

The findings of this study support the need for food-safety education efforts geared toward adolescents, with focal points in hand-washing and use of proper cooking temperatures, as well as differences in behavior within gender and some ethnic groups. The results of this study suggest that some differences in knowledge and behaviors between demographic groups are less pronounced in adolescents than those found in similar studies with adults. With limited food-handling experience and weaker relationships with demographic factors, dissemination of knowledge and development of safe behaviors through adolescent education may prove successful in improving consumer food safety. The information from this study will

allow researchers and educators to more effectively develop and implement food safety education materials for this age group, as well as target specific populations in need of educational interventions.

## ACKNOWLEDGMENTS

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## REFERENCES

1. Albrecht, J. A. 1995. Food safety knowledge and practices of consumers in the USA. *J. Consum. Stud. Home Econ.* 19:119-134.
2. Altekruze, S. F., D. A. Street, S. B. Fein, and A. Levy. 1996. Consumer knowledge of foodborne microbial hazards and food-handling practices. *J. Food Prot.* 59:287-294.
3. Anderson, J. B., T. A. Shuster, E. Gee, K. Hansen, and V. T. Mendenhall. 2004. A camera's view of consumer food safety practices. *J. Am. Diet. Assoc.* 104:189-191.
4. Bruhn, C. M., and H. G. Shutz. 1999. Consumer food safety knowledge and practices. *J. Food Safety* 19:73-87.
5. Byrd-Bredbenner, C., J. Maurer, V. Wheatley, D. Schaffner, C. Bruhn, and L. Blalock. 2007. Food safety self-reported behaviors and cognitions of young adults: results of a national study. *J. Food Prot.* 70:1917-1926.
6. Contento, I., J. Randell, and C. Basch. 2002. Evaluation and design of nutrition knowledge measures. *J. Nutr. Ed. Behav.* 34:2-25.
7. Coulston, A. 1999. President's page: personal responsibility and food safety. *J. Am. Diet. Assoc.* 99:236.
8. Department of Health and Human Services (DHHS). 2008. Healthy People 2010. Understanding and improving health - food safety. 1(10): 1. Available at: [http://www.healthypeople.gov/document/html/volume1/10food.htm#\\_edn5#\\_edn5](http://www.healthypeople.gov/document/html/volume1/10food.htm#_edn5#_edn5). Accessed 2 February, 2008.
9. Fein, S. B., C. T. Jordan Lin, and A. S. Levy. 1995. Foodborne illness: perceptions, experience, and preventive behaviors in the United States. *J. Food Prot.* 58:1405-1411.
10. Garayoa, R., M. Cordoba, I. Garcia-Jalon, A. Sanchez-Villegas, and A. I. Vitas. 2005. Relationship between consumer food safety knowledge and reported behavior among students from health sciences in one region of Spain. *J. Food Prot.* 68:2631-2636.
11. Haapala, I., and C. Probart. 2004. Food safety knowledge, perceptions, and behaviors among middle school students. *J. Nutr. Ed. Behav.* 36:71-76.
12. Jay, L. S., D. Comar, and L. D. Govenlock. 1999. A video study of Australian food handlers and food-handling practices. *J. Food Prot.* 62:1285-1296.
13. Klontz, K. C., T. Babgaleh, S. Fein, and A. Levy. 1995. Prevalence of selected food consumption and preparation behaviors associated with increased risks of foodborne disease. *J. Food Prot.* 58:927-930.
14. Li-Cohen, A. E., and C. M. Bruhn. 2002. Safety of consumer handling of fresh produce from the time of purchase to the plate: a comprehensive consumer survey. *J. Food Prot.* 65:1287-1296.
15. McIntosh, W. A., L. B. Christensen, and G. R. Acuff. 1994. Perceptions of risks of eating undercooked meat and willingness to change cooking practices. *Appetite* 22:83-96.
16. Meer, R. R., and S. L. Misner. 2000. Food safety knowledge and behavior of expanded food and nutrition education program participants in Arizona. *J. Food Prot.* 63:1725-1731.
17. Olsen, S. J., L. C. MacKinnon, J. S. Goulding, N. H. Bean, and L. Slutsker. 2000. Surveillance for foodborne disease outbreaks United States 1993-1997. *Morb. Mortal. Wkly. Rep.* 49:1-51.
18. Patil, S. R., R. Morales, S. Cates, D. Anderson, and D. Kendall. 2004. An application of meta-analysis in food safety consumer research to evaluate consumer behaviors and practices. *J. Food Prot.* 67:2587-2595.
19. Patil, S. R., S. C. Cates, and R. Morales. 2005. Consumer food safety knowledge, practices, and demographic differences: findings from a meta-analysis. *J. Food Prot.* 68:1884-1894.
20. Redmond, E. C., and C. J. Griffith. 2003. Consumer food handling in the home: a review of food safety studies. *J. Food Prot.* 66:130-161.

21. Richards, J., G. Skolits, J. Burney, A. Pedigo, and F. A. Draughon. 2008. Validation of an interdisciplinary food safety curriculum targeted at middle school students and correlated to state educational standards. *J. Food Sci. Ed.* 7:54-61.
22. Roseman, M., J. Kurzynske. 2006. Food safety perceptions and behaviors of Kentucky consumers. *J. Food Prot.* 69:1412-1421.
23. SAS Help and Documentation. 2007. Multiple comparisons. Available at: <http://support.sas.com/documentation/onlinedoc/91pdf/index.html>. Accessed on September 1, 2009.
24. Shiferaw, B., P. Cieslak, The FoodNet Working Group, S. Yang, F. Angulo, D. Vugia, R. Marcus, J. Koehler, and V. Deneen. 2000. Prevalence of high-risk food consumption and food-handling practices among adults: a multistate survey, 1996-1997. *J. Food Prot.* 63:1538-1543.
25. Tauxe, R. V., D. A. Peuges, and N. Hargrett-Bean. 1987. *Campylobacter* infections: the emerging national pattern. *Am. J. Publ. Health.* 77: 1219-1221.
26. Unklesbay, N., J. Sneed, and R. Toma. 1998. College students' attitudes, practices, and knowledge of food safety. *J. Food Prot.* 61:1175-1180.
27. US Census Bureau. 2006. State and Metropolitan Area Data book: 2006. Available at: <http://www.census.gov/prod/2006pubs/smadb/smadb-06appc.pdf>. Accessed September 1, 2008.
28. USDA and FDA. 1998. USDA/FDA education initiative: evaluating the placement of food safety education in American schools. Available at: [vm.cfsan.fda.gov/~dms/fseduin2.html](http://vm.cfsan.fda.gov/~dms/fseduin2.html). Accessed February 3, 2008.
29. Woodburn, M. J., and C. A. Raab. 1997. Household preparers' food safety knowledge and practices following widely publicized outbreaks of foodborne illness. *J. Food Prot.* 60:1105-1109.
30. Zhang, P., and K. Penner. 1999. Prevalence of selected unsafe food consumption practices and their associated factors in Kansas. *J. Food Saf.* 19:289-297.

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# GENERAL INTEREST PAPER

## Safety of Imported Foods

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### SUMMARY

Melamine in pet food, *Salmonella* Saintpaul in peppers, diethylene glycol in toothpaste, chloramphenicol in fish! Recent press accounts have raised numerous questions about the safety of imported foods and who is responsible for monitoring and testing imports for safety.

Recently (May 2009), several groups at the University of Wisconsin, including the Center for World Affairs and the Global Economy (WAGE), the College of Engineering, and the Food Research Institute, cosponsored a meeting on Food Import Safety. Speakers from university, industry, and government addressed the complex regulatory, economic, scientific, and industrial quality-control issues related to safety of food imports. (More information about the conference, including some of the presentations, is available at: <http://wage.wisc.edu/events/?ID=527>).

### SCOPE OF PROBLEM

Although we certainly have foods produced in the United States under unsanitary conditions — witness the *Salmonella* outbreak due to peanuts/peanut butter — there appears to be less control over the quality and safety of imported foods. There has been at least a 75% increase in food imports into the US since 2001, while at the same time, FDA has lost significant funding and staff needed to monitor and inspect imported items.

Federal agents perform some inspections at borders, but at least 80% of domestic food safety work is done at the state and local level. Some import violations detected in New York include illegal colors and sweeteners, antibiotic residues, excess sulfite, lead-soldered cans, heavy metals in fish and candy, unlabeled allergens, preserved fish and other low-acid foods with inadequate levels of salt, and “bush meat” from Africa (which may contain exotic insects and viruses).

According to information presented at the meeting, the underlying reasons for problems with imported foods vary greatly. Contamination and adulteration may be unintentional and occur because farmers or food processors are unfamiliar with the importance of certain preventive measures or which additives are approved for use in the US. For example, in 1990, Mexico was the largest exporter of melons to the US, with 61% of the market. However, a few years later,

following an FDA investigation of illness associated with these fruits, Mexican cantaloupes were banned from the US because of unhygienic conditions in the fields that facilitated contamination of the fruit with *Salmonella*.

In other cases, food adulteration is intentional. Usually, the motive is economic. The Chinese food production system, for example, is very competitive and decentralized. Slim profit margins have driven some food processors to cut corners and use cheaper ingredients, such as melamine as a substitute for protein. Food fraud is a growing problem that may involve adulteration, counterfeit product or labels, comingling, and substitutions. Some counterfeit foods have limited distribution while others are produced on an industrial scale and may be controlled by organized crime. Combating food fraud is an ongoing struggle because counterfeiters are smart, well-informed people who adapt to circumvent new control strategies (and they have been known to attend anti-counterfeiting conferences!).

International sourcing of food ingredients complicates efforts to ensure food safety. Recent highly publicized outbreaks associated with melamine-contaminated wheat gluten and *Salmonella*-contaminated peanuts illustrate the potential for a single unsafe ingredient to severely impact numerous products and brand names. American food manufacturing companies import many ingredients because they cost less or because they are no longer produced in the US.



## MONITORING AND ENFORCEMENT

Most companies have devised quality control programs to assess imported products and their manufacturers. These include examination of facilities, procedures, and supply chains at overseas plants; targeted testing of products for the most likely contaminants/defects; testing for adequacy of packaging; and consideration of consumer complaints related to the products. Human resources, health and safety issues, and environmental practices of suppliers are also considered by some companies. Suppliers may be ranked, with some targeted for more frequent audits/inspections than others, based on their track record. Ultimately, however, companies are responsible for their own products and cannot completely depend on foreign government inspectors or third party auditors to ensure authenticity and safety of imported materials.

Effective and cost-efficient monitoring of imported goods requires intelligent sampling strategies to target shipments with the greatest risk as well as adequate analytical methods to detect contaminants and adulterants in complex food matrices. An automated targeting system is used by Customs and Border Protection (CBP) to indicate which shipments of cargo coming across the US/Mexican border should be inspected. To expedite efficient transport of food across the border, there are government-business programs which inspect and provide certification for shipments at packing and processing plants so that the cargo need not be inspected at the border. However, this system is not foolproof; there have been cases in which trucks with certified cargo have been diverted and drugs or people hidden amidst the cargo in the trucks.

New analytical challenges are constantly arising. Melamine was not initially detected in pet food because it was not considered to be a likely contaminant. It is measured as protein in analyses that simply measure nitrogen content. More specific tests to detect melamine in foods were quickly developed in response to crises involving poisoning of animals and people.

Future episodes of economic adulteration may involve virtually any compounds or materials that give a producer a cost advantage.

## THE WAY FORWARD

Prevention and detection of food adulteration and fraud are extremely multidisciplinary endeavors that require industry and governmental regulators to collaborate with scientists, economists, and the legal profession. Many speakers at the Wisconsin conference mentioned that effective responses to incidents of food fraud and contamination are complicated by policies that restrict flow of information among government agencies, the food industry and the public. Concern about potential lawsuits, proprietary information on ingredients and their sources, and protection of turf by different regulatory units sometimes impede collaboration for solving problems. Examples of successful sharing of information, such as some investigations of workplace accidents by OSHA and of medical errors by some hospitals, were discussed.

Because of all the challenges discussed above, our current food regulatory system is grossly underfunded, fragmented, and not very effective at dealing with imports. Food law in the US is at a crossroads with rapidly increasing trade, more incidents of adulteration, unstable markets, and public outrage at contamination incidents. Several proposed changes in current law were discussed at the conference.

Mismanagement of the BSE (mad cow disease) outbreak in the European Union triggered passage of the General Food Law in 2002 and an independent regulatory agency, the European Food Safety Authority (EFSA), was created. Transparency, the involvement of stakeholders, and reliance on independent scientific expertise are part of the new food protection strategy. The rapid response to high levels of dioxin detected in a routine sample of pig fat and then in pig feed in Ireland in 2008 illustrates the success of this system. The European Rapid Response System for Food and Feed coordinated a rapid investigation of this incident by quickly tracing the distribution of pigs from affected farms through slaughtering facilities and export to numerous other countries.

Seventeen days after the initial positive test, the decision was made to recall all pork products produced in the previous three months. Although controversial, this rapid recall prevented serious health effects, and open communication with the public quickly restored confidence in Irish pork after this incident.

However, rapidly developing countries often do not have a well-developed food safety monitoring system despite being major suppliers of some ingredients and certain raw and processed foods. For example, until the mid-1980s, there were no significant national food safety regulations or programs in China. Even today, food safety laws are not uniformly well-enforced there because of a lack of personnel and established procedures. Moreover, even when safety standards are established and enforced, small stakeholders may not comply with the new standards because they are too expensive to implement, as was the case with cantaloupes grown in Mexico. Public-private partnerships have been established in Mexico to help small farmers to reduce input costs, understand new regulations, and afford improvements in water treatment and packing facilities.

A global Food Protection Organization under the auspices of the United Nations has been proposed as an institution parallel to WHO and FAO. This organization would be proactive and could, for example, require use of HACCP systems to prevent contamination and establish uniform audit procedures and traceability systems. This new global food safety organization could aid in production of safe food throughout the world and coordinate responses to food safety and security challenges such as population growth, climate change, shrinking resources (such as fresh water), diversion of crops to biofuels, and political instability and inaction. As the world food supply becomes more interconnected, interventions to address these challenges must identify potential new targets for economically motivated adulteration as well as supplying chain improvements such as verification programs, better risk assessment for specific commodities, and improved detection methods.

# SPECIAL INTEREST REPORT

## The Retail Food Safety Consortium: A New Resource for the Retail Food Safety Community

RICHARD H. LINTON

Professor Food Safety, Purdue University, 745 Agriculture Mall Dr., West Lafayette, IN 47907-2009, USA

In 2005, the Retail Food Safety Consortium (RFSC) was first founded with a collaboration among five land grant universities (University of Arkansas, Clemson University, Purdue University, Rutgers University, and Utah State University) and three science-based associations that involve retail food safety stakeholders (Association of Food and Drug Officials, National Environmental Health Association, and International Association for Food Protection). The RFSC, through networking, information sharing, and strategic planning of activities, enhances the ability of food safety professionals to work more effectively with the retail food industry. There are four main goals of the newly formed consortium: (1) Enhance collaboration between retail food safety professionals, (2) Identify and scientifically validate retail food safety practices, (3) Collect, develop, review, and disseminate retail food safety resources, and (4) Identify and prioritize retail food safety research needs.

In 2007, the collaborative group received a grant from USDA-CSREES to enhance and expand its activities related to retail food safety. As part of this effort, a new Web site was created and is available at [www.retailfoodsafety.org](http://www.retailfoodsafety.org). The primary intent of the Web site is to provide information and training materials relative to food safety and safe food handling for retail food establishments and foodservice operations. The RFSC is dedicated to providing food safety information to regulator, educators, and food industry professionals who serve the retail food industry. At the annual Association of Food and Drug Officials meeting this past June, the new Web site was launched. To date, there are links to over 1,000 different resources important to retail food safety stakeholders.

Within the site, there is retail food-safety information specific to national, state, and counties within states.

- National information (<http://www.retailfoodsafety.org/national/>) contains information about federal agencies, industry-associated groups and other organizations involved with retail food operations. Current content includes information from the Conference for Food Protection, United States Department of Agriculture,

United States Food and Drug Administration, International Association for Food Protection, Institute of Food Technologists, Association of Food and Drug Officials, National Environmental Health Association, Food Marketing Institute, National Restaurant Association, and the President's Food Safety Working Group.

- State information (<http://www.retailfoodsafety.org/state/>) includes information about state agencies, state industry-associated groups and other organizations that are involved with retail food programs. Current content includes state associated information about retail/foodservice Food Code(s), food manager's certification requirements, and universities offering retail food safety programs. Issues important to the state Retail Grocers Association, Restaurant Association, Environmental Health Association, Health Department and Department of Agriculture.
- County information (<http://www.retailfoodsafety.org/county/>) for each state provides specific information for each county about jurisdictional food handling requirements and retail food-safety training opportunities. Current content includes information from local Health Departments, Departments of Agriculture and Forestry Resources.

Another important component of the Web site is dedicated to providing training resources that can be used to better educate retail food safety professionals. This part of the Web site (<http://www.retailfoodsafety.org/resources/>) provides retail food safety information for educators, trainers, and learners for a wide variety of topics in different educational formats, languages, and audiences. As you enter the Web site, you will have the opportunity to "search" for resources and also an opportunity to "submit" resources that you feel would help others.

The search function (<http://www.retailfoodsafety.org/resources/search/>) will allow you to perform specific search for resources located on the Web site. By limiting your search criteria, you will be able to locate resources on specific topics of interest. Adding in a keyword will allow you to search within the title, author, and description of a resource. You can also limit your search to a specific topic, audience type, origin, language, and/or location.

The submit function (<http://www.retailfoodsafety.org/resources/submit/>) allows you to provide additional

links to the national Web site. As part of the submission process, a RFSC content committee will review all submitted information to ensure that it is appropriate for use on the RFSC Web site.

While the RFSC Web site is still in its infancy, I think you will find this new Web-based resource a valuable tool for the retail food safety professional. If you get the chance, check out the site and submit retail food safety resources that you think would benefit others.

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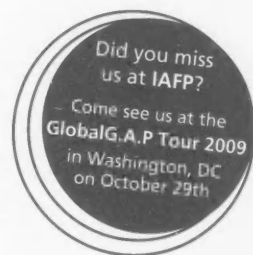


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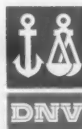
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# IAFP 2009 IN REVIEW



For an Association nearing 100 years of Membership, there was no place more fitting than warm, friendly Texas in July to mirror the tradition of fellowship and hospitality that marks the IAFP Annual Meeting experience. Indeed, the name Texas is derived from the Caddo Indian word “teysha” meaning “hello friend.” Also known as the “Lone Star State,” Texas designed its state flag with a lone star and three stripes of red, white, and blue to symbolize its spirit of bravery, purity, and loyalty—and from July 12 to 15, such was the mood perpetuated by more than 1,725 food safety professionals who rounded up at the beautiful Gaylord Texan Resort in Grapevine for IAFP 2009.

Every year, the IAFP Annual Meeting is uniquely shaped by an ambitious Program Committee and generous, innovative sponsoring companies whose products and visions are brought to life through the presence of charismatic representatives. This year, through dynamic exhibits in the Longhorn Exhibit Hall and various networking events, attendees were educated and serenaded by nearly 100 both new and returning companies. Please review the list on page 741 to join us in grateful support of these exhibitors and sponsors, and especially to welcome those who joined forces with us for the first time in Grapevine.

The increasingly popular educational IAFP Workshops, presented by prominent industry professionals and held for early-arriving attendees on Friday and Saturday, have become the meeting's unofficial kick-off events. Your Toolkit for Cleaning by Design...What Can Go Right was developed by a team of experts for engineers, processors, manufacturers, and food safety managers responsible for designing cleaning and sanitation programs. In the Hands-on Microbiological Sampling and Testing in Food Safety Management, participants were led by four governmental and industry representatives in examining the principles and limitations of microbiological testing for food safety assurance. Organized and instructed by Frank Yiannas, and based on his recent book, the workshop Beyond Food Safety Management—How to Create a Food Safety Culture guided participants toward a working knowledge of behavioral change theories, the elements and benefits of introducing a food safety culture, and real-world advice for management challenges in the field.

At 5:00 p.m. on Saturday, the Welcome Reception was the place to be for reconnecting with colleagues or, for new Members and first-time meeting attendees, becoming acquainted with the Executive Board





and active Association Members. Particularly for students and those who had traveled a great distance, the reception offered a relaxing



atmosphere in which to learn new faces or to exchange introductions and enjoy casual conversation—the perfect segue into Sunday's flurry of productive meetings for committee and professional development group (PDG) members. We encourage you to review the minutes from Sunday's essential gatherings (beginning on page 710) and let the IAFP office assist you in becoming involved with the group that best fits your interests and goals.

The official commencement event of IAFP 2009, Sunday evening's Opening Session in the Grapevine Ballroom provided the opportunity for President Stan Bailey and the Local Arrangements Committee Chairs, Fred Reimers and Toby Breland of the Texas Association for Food Protection (TAFP), to extend a rousing welcome and offer attendees an overview of meeting activities and area attractions. President Bailey was pleased to announce the establishment of three new IAFP Affiliates in Colombia, Hungary, and the state of Arkansas, and welcomed those present to accept their charters: Jairo Romero of the Colombian Association of Food Science and Technology (ACTA); and Mike Sostrin, Steve Ricke, and Hillary Hagan of the Arkansas Association for Food Protection.

As IAFP Foundation Chair, Gale Prince took the stage to explain the Foundation's accomplishments and ongoing aspirations, sharing enthusiastically how he opted to "spend" his government stimulus check and inviting the audience to help meet or exceed his own renowned generosity. As a testimony to the success of the Foundation, Mr. Prince welcomed to the stage the six grateful recipients of the IAFP 2009 Student Travel Scholarship: Dominic K. Bagenda of Future University Hakodate in Japan; Jeremy William Chenu of the University of New South Wales in Australia; Gashaw Mersha Tessema of Addis Ababa University in Ethiopia; Hyo-Min Nang of Dongguk University in South Korea; Aaron R. Uesugi of Cornell University in New York City; and Stelios Viazis of the University of Minnesota in Saint Paul.

Next to be acknowledged was Kathleen Rajkowski of the USDA-ARS Food Safety Intervention Research Unit in Wyndmoor, Pennsylvania. For her many years of productive, innovative work and IAFP service, Dr. Rajkowski was inducted as a Fellow of the Association in a plaque presentation by President Bailey and Past President Gary Acuff. President-Elect Vickie Lewandowski then introduced Dr. Paul Hall, whom she had the honor to recommend as the evening's hallmark Ivan Parkin Lecturer. Navigating Food Safety through Times of Economic Chaos: A Call to Action was an educational journey through which Dr. Hall playfully channeled Johnny Carson's legendary "Carnac the Magnificent" routine—as Paulnac, for this occasion, and complete with the hat (while implicating a few IAFP all-stars to support his data and closing points)! At the conclusion of Opening Session, an enlightened audience made their way to the Longhorn Exhibit Hall for the Cheese and Wine Reception, a fun and delectable networking event made possible by longtime sponsor Kraft.

Monday unveiled the three-day showcase of prime symposia and technical presentations that marks IAFP as the world's leading food safety conference. It's no simple task: maintaining this status requires year-



round planning that begins at the close of each Annual Meeting. This year's excellent program was the culmination of efforts by Program





Committee Chair Indaue Mello-Hall, Vice Chair Faye Feldstein, and their team of leaders from all sectors of food safety. Because planning a conference of such scope can only be accomplished when diverse experts are willing to give



tremendous amounts of energy and time, we ask that you help us express our most sincere appreciation to each and every fellow colleague who served on the Program Planning Committee. Likewise, we offer a round of applause for the numerous companies that graciously sponsored refreshments—for a variety of the meeting's events, for breaks in the common areas between sessions, and for lunch in the Exhibit Hall on Monday and Tuesday—to ensure that attendees stayed nourished and alert throughout the meeting!



“Texas Fun on the Ranch” was the theme of the Monday Night Social at the Circle R Ranch, where participants braved the evening heat to ride a horse-drawn hay wagon, try their hand at shooting and roping, and feast on good ole Texas barbecue. With alive country-western band and line dancing, it was a great venue for kicking back with friends and absorbing a little Southwest culture.

Students, a growing force in IAFP's Membership base, continue to be a valuable and lively presence at Annual Meeting. From developing scientists to scholarship recipients to session monitors, these young leaders demonstrate that they truly are the future of food safety, and that they support one another's future by providing resources at the Student PDG booth and overseeing the Job Fair. Organized networking opportunities for students included the popular Student Luncheon, where Dr.



Stephen Grove gave an inspiring talk on his graduate school years; and the well-attended Student Mixer on Tuesday evening, where students exchanged







ideas and shared casual conversation in a relaxed setting.

At the annual Business Meeting on Tuesday, President Stan Bailey reviewed the Association's



accomplishments and activities of the past fiscal year, and presented President's Recognition Awards to IAFP Members Fred Reimers and Randy Dags, and IAFP staff members Tamara Ford, Leilani McDonald, and Trinette Worthington. Standing committee chairpersons delivered brief reports of their activities, and Affiliate Council Chair Roger Cook reported on the growing base and continued efforts of the Association's Affiliate organizations. Off the agenda, the Florida Association for Food Protection carried on their tradition of presenting a check for \$1,000 to the IAFP Foundation—preceded, of course, by another entertaining skit, which this year revolved around the adventure of three little pigs as they traveled the world to find protection against the H1N1 virus (commonly referred to as "swine flu")! Though some of the pigs were not successful, there was one happy pig in the end, thanks to a vaccine. (The big winner, of course, was the IAFP Foundation. Thanks, FAFP!)

The Silent Auction area was the perfect between-session destination for relaxation, conversation—and a little shopping. The array of goods donated to benefit the IAFP Foundation encompassed travel and sports souvenirs, a variety of gift cards, exquisite jewelry, and other items one never needs but thoroughly enjoys buying (particularly during the final minutes of bidding)! Such is the spirit of IAFP Silent Auction shoppers who—along with those who pledged cash contributions throughout the meeting, and those who participated in the fundraising dinner at Cowboys Golf Club—succeeded in raising \$23,970 for the vital programs supported by the Foundation.

As every year, three days of groundbreaking sessions ended on a strong note Wednesday afternoon as attendees flocked to absorb the Closing Session's John H. Silliker Lecture, *The 2008 Irish Dioxin Crisis: A Public Health, Food Safety, Economic, Legal, or a Risk Communication Challenge?*, presented by Dr. Patrick Wall of the School of Public Health and Population Sciences at the University College Dublin in Belfield, Ireland. A summary of Dr. Wall's outstanding presentation appears on page 675. We gratefully acknowledge Silliker, Inc.'s annual commitment to funding this key lecture series.

The Grapevine Ballroom was the picture of elegance for Wednesday evening's Awards Banquet, the meeting's traditional grand finale social event. It is here that attendees don their best and converge for an upscale evening out to toast one another's professional contributions and endeavors of the past year, and especially to honor those fellow colleagues who have joined the privileged line of IAFP Award recipients. As the evening's emcee, President Stan Bailey guided the ceremony and offered final comments before passing the gavel to Vickie Lewandowski, who thanked Dr. Bailey for his leadership and ushered the Association into a new year of Advancing Food Safety Worldwide.

We thank each and every one of you, whether working solo or as part of a team, for joining us in Grapevine. By simply being there during difficult economic times, you supported your Association as a whole and underscored the fact that global food safety is a pursuit that must be afforded for the health and happiness of all. We look forward to sharing this ongoing mission with you as we celebrate IAFP 2010 in sunny Anaheim, California, next August 1–4. See you there!



# IAFP 2009 AWARD WINNERS

Each year, the International Association for Food Protection honors a single company with its most prestigious award, the Black Pearl, in recognition of that company's efforts in advancing food safety and quality through consumer programs, employee relations, educational activities, adherence to standards, and support of the goals and objectives of IAFP. The recipient of the 2009 IAFP Black Pearl Award is Schnuck Markets, Inc.



Black Pearl Award Winner Schnuck Markets, (back row left) Gary Acuff, Dianna Pasley, Mary Frances France; (front row left to right) Wilbur Feagan, Cherie Smith, Mary Moorkamp, Dave Bell, Mary Ann Goris, Lori Willis and Scott Schnuck.

Saint Louis-based Schnuck Markets, Inc. is a family-owned combination food and pharmacy retailer that has served customers for the past 70 years. Schnucks was founded in 1939, in a corner confectionery operated by Anna and Edwin Schnuck. The company has grown to include 105 stores and 15,500 associates in seven states.

Incorporated in 1953, brothers Donald and Edward Schnuck began to expand the company through acquisition as well as new construction. Over the years, the family developed a reputation for being innovators in the industry and for offering top quality perishables and high levels of customer service, leading to the tagline "The Friendliest Stores in Town."

Today, *Forbes* magazine reports that Schnucks is among the top 20 largest privately-owned grocers. The third generation is at the helm. The six children of Doris and the late Donald Schnuck continue to build on their dad's and uncle's reputations for customer and community service, and remain committed to the company's growth as well as its evolution.

In addition to hallmarks of quality, variety, service and value, the Schnuck family realizes today's grocery customers want to learn more about their food—where it comes from, how it was processed, how to safely handle it, and how to prepare and serve it. Leaders of Schnucks remain committed to building and sharing their expertise with customers across all markets.

Sponsored by Wilbur Feagan  
and



## FELLOW AWARD

Fellows are professionals who have contributed to IAFP and its Affiliates with distinction over an extended period of time. Dr. Kathleen T. Rajkowski received a distinguished plaque in recognition of this prestigious award.



*Gary Acuff presents Kathleen Rajkowski with the IAFP Fellow Award.*

### **Kathleen T. Rajkowski** Wyndmoor, Pennsylvania

**D**r. Kathleen T. Rajkowski is the 2009 recipient of the IAFP Fellow Award. Fellows are professionals who have contributed to IAFP and its Affiliates with distinction over an extended period of time. Dr. Rajkowski is being recognized for her many years of productive, innovative research and dedicated service to IAFP.

Currently a research microbiologist with the USDA-ARS in the Food Safety Intervention Research Unit in Wyndmoor, Pennsylvania, Dr. Rajkowski received her MS degree from the University of Connecticut, her Ph.D. from The Ohio State University, and completed post-doctoral work with the FDA.

Dr. Rajkowski is studying the use of non-thermal and chemical interventions to reduce human pathogens on finfish and in pond water and

freezing regimens on the survival of the human pathogens on finfish. Previous work included the study of non-thermal and chemical intervention strategies to reduce human pathogens on sprout seeds and raw produce; the re-growth potential of gram negative bacteria in reconditioned waste water used to clean hog trailers; research to verify the microbial safety of non-homogeneous food products; and the effect of gamma irradiation on pork products.

In 2004, Dr. Rajkowski received the IAFP Maurice Weber Laboratorian Award. As part of the Microbial Food Safety Research Unit, she earned the 2006 FPA Food Safety Award; and as part of the USDA-ARS-ERRC Food Irradiation Research Group, she earned the 2007 Lifetime Achievement Award from the Food Irradiation Processing Alliance, which recognized the group's pioneering research on the use of ionizing radiation to improve the safety of foods from 1981 to 2007. Dr. Rajkowski is Chair-elect of the Seafood Safety and Quality PDG and a founding member of the Water Quality PDG.

## PRESIDENT'S LIFETIME ACHIEVEMENT AWARD



*Stan Bailey (right) presents R. Bruce Tompkin with the President's Lifetime Achievement Award.*

### **R. Bruce Tompkin**

LaGrange, Illinois

**R** Bruce Tompkin is the recipient of the 2009 President's Lifetime Achievement Award. This award is given at the discretion of the Association President, to recognize an individual who has made a lasting impact on "Advancing Food Safety Worldwide" through a lifetime of professional achievements in food protection. Dr. Tompkin has distinguished himself as a leader of public service through his contributions to the field of science.

After earning his Ph.D. in Microbiology (1963) from Ohio State University, Dr. Tompkin joined Swift & Company in 1964. In 1966 he became Chief Microbiologist, a position he retained until 1993 before moving on to ConAgra Refrigerated Foods as Vice President of Product Safety. There, he and his colleagues investigated how to control pathogens in a wide variety of foods and in food processing

environments, the use of additives and new processes to improve food safety, and the role of sodium nitrite in controlling *Clostridium botulinum*. He has contributed more than 175 publications, presentations and 30 book chapters.

An IAFP Member since 1988, Dr. Tompkin served on the European Symposium Organizing Committee for the first such meeting held in Prague in 2005. He was a member of the National Advisory Committee on Microbiological Criteria for Foods for 10 years, and a member of the International Commission on Microbiological Specifications for Foods (ICMSF) for 20 years, serving as a consultant to the ICMSF for an additional 7 years.

Throughout his career, Dr. Tompkin helped define the principles of HACCP, the concept of a food safety objective, and the role of microbiological testing in food safety management systems. Having retired from ConAgra in 2002, he continues to promote food safety through participation on committees and other activities.

## HONORARY LIFE MEMBERSHIP AWARD

The recipient of the IAFP 2009 Honorary Life Membership Award are Larry Beuchat, Frank Busta and Carl Custer. This prestigious honor is awarded to long-time IAFP Members for their dedication to the high ideals and objectives of the International Association for Food Protection and for dedicated service to the Association.



Stan Bailey (center) presents Carl Custer (left) and Larry Beuchat (right) with the IAFP Honorary Life Membership Award. (Frank Busta was not present.)

### Larry R. Beuchat Griffin, Georgia

A 2009 recipient of the Honorary Life Membership Award, Dr. Larry R. Beuchat is being honored for his dedication and service to the high ideals and objectives of the Association. An IAFP Member for 38 years, his research contributions were recognized in 2008 with the establishment of the Larry R. Beuchat Young Researcher Award.

Dr. Beuchat earned his BS in Horticulture at Pennsylvania State University; both his MS and Ph.D. in Food Science, with a minor in Microbiology and Public Health, were attained at Michigan State University. After working in research and development at Quaker Oats Company, he joined the University of Georgia in 1972, where he is now a Distinguished Research Professor in the Center for Food Safety and Department of Food Science and Technology.

Current research interests for Dr. Beuchat include the microbiology of fruits, vegetables, and nuts; methodologies for detecting and enumerating pathogenic bacteria, yeasts, and molds in foods; metabolic stress and injury of foodborne microorganisms; relationships of water activity

to microbial growth; and efficacy of disinfection and preservation technologies. He has written, edited, or co-edited five books, and authored or co-authored 86 chapters and monographs, 476 refereed scientific journal articles, 110 miscellaneous scientific publications, and 527 abstracts in the area of microbiological safety and spoilage of foods.

An Associate Editor of *Journal of Food Science* (1989–1994) and Co-editor of *Journal of Food Protection* (1994–2001), Dr. Beuchat is a current member of the editorial boards of *International Journal of Food Microbiology* and *Food Microbiology*. He is a Fellow of IAFP, the Institute of Food Technologists, and the American Academy of Microbiology.

### Frank F. Busta St. Paul, Minnesota

Professor Francis (Frank) F. Busta is the recipient of a 2009 Honorary Life Membership Achievement Award, which recognizes his dedication and service to the high ideals and objectives of the Association. An IAFP Member since 1969, he received the 1981 Educator-Industry Award.

Since 2007, Dr. Busta has been the Director Emeritus and Senior Science Advisor of the National Center for Food Protection and Defense (NCFPD) based at the University of Minnesota, following his 2004 appointment as its first director. Previously he held faculty positions at North Carolina State University; the University of Florida, where he chaired the Department of Food Science and Human Nutrition (1984–1987); and the University of Minnesota, where he served as Head of the Department of Food Science and Nutrition (1987–1997).

Dr. Busta's research areas are in food safety, growth and survival of microorganisms after environmental stress in food, and food defense. He has published more than 125 refereed research papers. Dr. Busta retired from the International Commission on the Microbiological Specifications for Food (ICMSF) after 15 years of service.

Past President of the Institute of Food Technologists (IFT, 1995–1996), Dr. Busta is currently Senior Science Advisor of IFT's contract from the FDA. He is a Fellow of IFT, the American Academy of Microbiology, the American Association for the Advancement of Science, the Institute of Food Science and Technology (UK), and the International Academy of Food Science and Technology.

### **Carl S. Custer**

Bethesda, Maryland

**F**or his dedication and service to the high ideals and objectives of the Association, Carl S. Custer is the recipient of a 2009 Honorary Life Membership Award. An IAFP Member

since 1992, he has been active in the Capital Area Association for Food Protection and was the 2007 Harry Haverland Citation Award recipient and Ivan Parkin Lecturer.

Mr. Custer began his food microbiology career in 1966 as a technician, then as a graduate student for Dr. Carl Vanderzant at Texas A&M University, where his projects included dairy, meat, and seafood microbiology. He retired from the USDA Food Safety and Inspection Service (FSIS) in 2007 after over 34 years as a bench and a desk scientist.

Food safety contributions by Mr. Custer have encompassed the inhibition of *Clostridium botulinum*; inhibiting nitrosamine formation; analysis and inactivation of *Trichinella spiralis*; physics and microbiology of cooling heated foods; thermal and non-thermal inactivation of bacterial pathogens in traditional and ethnic foods; the microbiology and safety of fermented and dry-cured meat products; HACCP development and implementation; and predictive microbiology. These issues included developing the scientific basis for regulatory policy development and rule promulgation. Mr. Custer also served as a trainer for FSIS inspectors, the FSIS Hotline, retail processors and inspectors, small farm processors, and country ham processors.

Mr. Custer has served on various IAFP committees and is a past Chair of the Meat and Poultry Safety and Quality Committee, Affiliate Council, Nominating Committee, and Awards Committee. He is also a member of the American Society for Microbiology, and served 12 years on the Food Microbiology Research Conference Executive Board, two as Chair. Since retiring, Mr. Custer enjoys cooking, gardening, woodworking, and motorcycle touring on one of his four vintage Honda motorcycles.

## HARRY HAVERLAND CITATION AWARD

This award is presented to an individual who is recognized for their years of dedication and devotion to the Association and its ideals and objectives.



Joan Menke-Schaenzer (left) and Gary Acuff (right) present Jeff Farber with the 2009 Harry Haverland Citation Award.

### Jeffrey M. Farber

Ottawa, Ontario, Canada

As the 2009 recipient of the Harry Haverland Citation Award, Dr. Jeffrey M. Farber is recognized for his years of dedication and devotion to the Association's ideals and objectives. With his determination and commitment to creating a safer global food supply, Dr. Farber helped launch IAFFP's international expansion through annual European meetings and the Student Travel Scholarship.

Dr. Farber obtained his MS in Applied Medical Microbiology and Immunology and his Ph.D. in Food Microbiology from McGill University in Montreal. He worked as a research scientist, Division Chief, and Associate Director at Health Canada before assuming his present role there as Director of the Bureau of Microbial Hazards, Food Directorate, in the Health Products and Food Branch. Extremely well-versed in both the risk assessment and policy areas, he leads a group of about 50 on a wide range of issues dealing with microbial food safety, and plays a key role

in developing the policy approaches that are currently in place in the Food Directorate.

Having taught a full course in food microbiology for ten years at the University of Ottawa, Dr. Farber holds an Adjunct Professor position in the Department of Biochemistry, Microbiology and Immunology. His interests and expertise focus on *Listeria monocytogenes*, *Enterobacter sakazakii*, fresh-cut produce, and molecular typing of foodborne pathogens. He has produced over 100 publications and numerous book chapters, and has edited three books.

With extensive experience working at the international level with FAO/WHO, Dr. Farber is currently the alternate Codex Canadian Head of Delegation for the Committee on Food Hygiene. He is also Co-Chairman of the Canadian Listeriosis Reference Service; a member and Treasurer of the ICMSF; former Associate Editor-in-Chief of the *International Journal of Food Microbiology*; and has served on numerous other editorial boards. Past President of IAFFP and the Contents Editor for *IAFFP Report* since 2007, he remains a vital force in the Association.

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## FOOD SAFETY INNOVATION AWARD

This award is presented to an individual or organization for creating a new idea, practice, or product that has improved public health and quality of life by making a positive impact on food safety. Dr. Paula Fedorka-Cray is being recognized for her efforts toward improving product sampling sensitivity.



Vickie Lewandowski (left) and Frank Yiannas (right) present Paula Fedorka-Cray with the 2009 Food Safety Innovation Award.

### Paula Fedorka-Cray

Athens, Georgia

The recipient of the 2009 Food Safety Innovation Award is Dr. Paula Fedorka-Cray. This award is presented to an individual or organization for creating a new idea, practice, or product that has improved public health and quality of life by making a positive impact on food safety. Among her many research accomplishments and contributions to industry and regulatory agencies, Dr. Fedorka-Cray is responsible for recognizing the need for a molecular typing system complementary to the CDC PulseNet program and for implementing USDA VetNet in the ARS.

Since 1999, Dr. Fedorka-Cray has served as the Research Leader of the Bacterial Epidemiology and Antimicrobial Resistance Research Unit focusing on the ecology and pathogenesis of antimicrobial resistance. She also serves as the leader of the animal arm of the National Antimicrobial Resistance Monitoring System (NARMS).

Dr. Fedorka-Cray's love of science started at age 9 when she received her first chemistry set and literally blew up a few test tubes. Although offered scholarships to study music, she pursued a science career at The Pennsylvania State University, where she received her BS in Microbiology (1979); her MS in Bacteriology (1981) was earned at

North Dakota State University. She then joined the staff at the Johns Hopkins University in the Division of Geographic Medicine, where she worked with *Vibrio cholerae* and completed her MS in Administrative Science with an emphasis in behavioral studies and management. In 1985, she moved on to the University of Nebraska as an Instructor in the Department of Veterinary Medicine, completing her Ph.D. in Veterinary Microbiology (1989) from the school's Master of Science in Information Assurance (MSIA) Program. After working as an Assistant Professor at Nebraska for one year, she joined the USDA-ARS in 1991—first in Ames, Iowa, studying the pathogenesis and epidemiology of *Salmonella* in swine, then in Athens, Georgia, in 1997 to study the epidemiology of *Campylobacter* and *Salmonella* in poultry.

In addition to her work with the USDA VetNet program, Dr. Fedorka-Cray has received 17 honors and awards, authored or co-authored over 138 peer-reviewed publications and book chapters and 3 patents, and received 165 invited presentations. She has proudly mentored numerous graduate students and post-docs. Her IAFP activities have included presenting posters and papers; organizing and chairing symposia; and supporting colleague award nominations. Dr. Fedorka-Cray is also active in the Food Safety PDG and serves on the Program Committee.

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## INTERNATIONAL LEADERSHIP AWARD

The International Leadership Award is presented to an individual for their dedication to the high ideals and objectives of IAFP and for promotion of the mission of the Association in countries outside the United States and Canada.



Stan Bailey (left) and Pam Wilger (right) present Laurentina Pedrosa with the 2009 International Leadership Award.

### Laurentina Pedrosa

Lisbon, Portugal

This year's International Leadership Award is being presented to Dr. Laurentina Pedrosa for her dedication to the high ideals and objectives of IAFP, and for promotion of the mission of the Association in countries outside the US and Canada. Known by students and colleagues for her infectious enthusiasm and energy, she is continuously seeking ways to bridge the gap between countries with new science and technologies, and to forge links and partnerships throughout the world.

Dr. Pedrosa earned her DVM in 1986 at the Faculty of Veterinary Medicine in Lisbon, Portugal, and in 1992 completed her Ph.D. at the University of Newcastle upon Tyne in England. Since 2004, she has been Dean of the Faculty of Veterinary Medicine at Lusofona University in Lisbon and Emeritus Professor on Food Hygiene and Safety. From 1992 to 1996, Dr. Pedrosa held the position of Quality Director in the major meat companies in Portugal, responsible for the country's first ISO 9000 certification in the meat industry.

In 1996, she accepted a position as Associate Professor in Food Safety. Since then, she has designed and delivered food safety training courses for industry on hygiene and HACCP implementation, validation, and auditing. In 2002, she created the Nucleus for Continuous Research in Food Safety and Quality (NISQA) with the coordination of a CPD Course in Management of Quality and Food Safety; and an MS degree in Food Safety and Public Health, and has trained more than 500 graduates in this field.

Beyond her academic accomplishments, Dr. Pedrosa maintains her connection to the meat industry in her present appointment as Executive Director of the Portuguese Meat Industry Association (APIC). As founder and President of IAFP's first European Affiliate, the Portugal Association for Food Protection, she is a passionate advocate of the Association's mission in the international arena. She is active in numerous working groups, and has organized and presented at many of IAFP's Annual and European Meetings.

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## GMA FOOD SAFETY AWARD

This award is presented to an individual or organization in recognition of a long history of outstanding contributions to food safety research and education.



*Craig Henry presents Joy Gaze with the 2009 GMA Food Safety Award.*

### Joy Gaze

Chipping Campden, Gloucestershire, United Kingdom

The recipient of the 2009 GMA Food Safety Award is Joy Gaze. This year's award honors an individual's preeminence in and outstanding contributions to food safety. Ms. Gaze is recognized as an international authority in thermal processing and has contributed to the success of many food manufacturing companies. A well-established conference organizer, she has trained tens of thousands of food industry personnel throughout the world.

As Deputy Head of the Microbiology Department and Heat Resistance Group Manager at Campden BRI, the largest food research organization of its kind in the world, Ms. Gaze has built her career in the Microbiology Department, gaining her Applied Biology qualifications while establishing over 30 years of research expertise. She has developed an internationally recognized research portfolio on factors affecting the survival

of foodborne pathogens, with emphasis on the microbiological safety of heat-preserved foods. For this work, she has established collaborative projects with the UK Food Standards Agency, European Union, and universities worldwide. Notable publications include guidelines on pasteurization, the 6 log reduction process for *Listeria monocytogenes* of 70°C held for 2 minutes and the 90°C held for 10 minutes which has become established as industry best practice for psychrotrophic *Clostridium botulinum* in chilled foods.

Ms. Gaze has been a consultant for both national and multi-national food companies and given lectures in many countries, including Australia, New Zealand, USA, South Africa and the EU, being a reference contact for industrial troubleshooting, product development and food manufacturing issues. In addition, she has been a key educator for Campden BRI, training the food industry personnel in the microbiological implications associated with the safe manufacture of foods and drinks.

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## MAURICE WEBER LABORATORIAN AWARD

This award is presented to an IAFP Member for dedicated and exceptional contributions in the laboratory. It recognizes a commitment to the development and/or application of innovative and practical analytical approaches in support of food safety.



Fred Weber (left) and Lee-Ann Jaykus (right) present Joseph Odumeru with the 2009 Maurice Weber Laboratorian Award.

### Joseph A. Odumeru

Guelph, Ontario, Canada

Dr. Joseph A. Odumeru is the recipient of the 2009 Maurice Weber Laboratorian Award. He has dedicated his career for the past 20 years to the development and application of microbiological methods for the assessment of food quality and safety. He is a hands-on laboratory investigator of novel techniques for the detection and enumeration of foodborne pathogens.

Dr. Odumeru earned his BS Honors in Microbiology and Immunology from the University of Western Ontario (1980) and his MS (1982) and Ph.D. (1985) in Medical Microbiology from the University of Manitoba. He is currently the Laboratory Director of Regulatory Services, Laboratory Services Division, and an Adjunct Professor in the Department of Food Science at the University of Guelph, where he is responsible for food quality and safety testing services provided by the Division.

With work experience that includes 23 years of experience in diagnostic microbiology and research

work in industrial, medical and food microbiology, Dr. Odumeru continues to make significant contributions to the field of food microbiology, particularly the development of methods for the detection of *Listeria*, *Campylobacter* and *Salmonella* using front end immunomagnetic separation techniques and novel detection systems.

His research interests include development of rapid methods for the detection, enumeration and identification of microorganisms in food, water and environmental samples, molecular methods for tracking microbial contaminants in foods, automated methods for microbial identification, shelf-life studies of foods and predictive microbiology.

As a mentor, Dr. Odumeru has significantly impacted the careers of some 30 graduate and undergraduate students in food safety. He has authored over 60 research publications and review papers in peer-review journals, 70 abstracts, and numerous presentations in scientific meetings. Since 1999, he has been active in IAFP and the Ontario Food Protection Association, of which he is Past President.

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## LARRY BEUCHAT YOUNG RESEARCHER AWARD

This award is presented to a young researcher who has shown outstanding ability and professional promise in the early years of their career.



Stan Bailey (left) and Isabel Walls (right) present Kendra Nightingale with the 2009 Larry Beuchat Young Researcher Award.

### Kendra Nightingale

Fort Collins, Colorado

The recipient of the 2009 Larry Beuchat Young Researcher Award is Kendra Nightingale. This new award recognizes a young researcher who has shown outstanding ability and professional promise in the early years of their career. As a young professor, Dr. Nightingale's work in integrating basic and applied research with quantitative epidemiology to reduce the incidence of foodborne disease has provided a breakthrough for food safety.

Dr. Nightingale is an Assistant Professor in the Department of Animal Sciences at Colorado State University. She holds a BS and MS (2001) in Animal Science from Kansas State University, where she participated in the undergraduate honors research program before undertaking research evaluating the use of lactoferrin, a milk-derived protein, to decontaminate and extend the shelf life of beef products. She went on to complete her Ph.D. in 2005 at Cornell University, where she probed the molecular epidemiology, ecology and evolution of the human foodborne and animal pathogen *Listeria monocytogenes*.

Dr. Nightingale's research interests include both pre- and post-harvest food safety. Specifically, she seeks to gain a more comprehensive understanding of the molecular ecology and transmission dynamics of foodborne pathogens throughout the human food chain; identify risk factors that contribute to loading of the human food chain with foodborne pathogens and the subsequent spread of these pathogens along the food continuum; probe the molecular evolution and population structure of human foodborne and animal pathogens; define the underlying genetic mechanisms responsible for observed differences in virulence phenotypes within a given pathogen species; and study the pathogenesis of human foodborne diseases.

A member of several agricultural honor societies, Dr. Nightingale has received national level research awards from multiple organizations in the food industry, including the National Milk Producers Federation, the Institute of Food Technologists, and the International Association of Food Industry Suppliers. She currently serves on the *Journal of Food Protection* Editorial Board and Management Committee.

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INDUSTRY

## SANITARIAN AWARD

This award honors an IAFP Member for dedication and exceptional service to the profession of sanitarian, serving the public and the food industry.



*Katherine Swanson (left) and Isabel Walls (right) present Philip S. Wolff with the 2009 Sanitarian Award.*

### Philip S. Wolff

Washington, D.C.

Mr. Philip S. Wolff is the recipient of this year's Sanitarian Award, which honors an IAFP Member for dedication and exceptional service to the profession of sanitarian, serving the public and the food industry. With his extensive knowledge of dairy practices and equipment and tireless attention to detail, Mr. Wolff has made valuable contributions to the development of accurate and definitive regulatory guidelines.

Since 1993, Mr. Wolff has traveled extensively as the USDA's National Program Coordinator for Dairy Plant Surveys, Equipment and Facility Reviews. He earned his Associate degree (1979) in Milk Production and Milk Processing from SUNY College of Agriculture and Technology in Morrisville, New York. After working for several years in the dairy industry, he resumed studies at Cornell University, earning his BS in Food Science in 1990. His sanitarian career began with three years in the quality control lab of Dairylea. He later transferred

to the Syracuse fluid milk plant's receiving and central producer testing labs, and went on to work in the milk receiving and quality control lab at Queensboro Farm Products in Canastota before joining the USDA as an Agricultural Commodity Grader for the Dairy Grading Branch in Minneapolis, Minnesota, where he performed plant surveys and graded products sold under the price support program or that displayed the USDA Grade AA shield.

A member of the Dairy Practices Council since 1998, Mr. Wolff was a task force director IV from 2002 to 2007. After the 2005 NCIMS conference, he represented the USDA in writing the water criteria for the 2007 Pasteurized Milk Ordinance. He is an active member and contributor to the documents of the 3-A Committee on Sanitary Procedures, and a current member of 3-A's Steering and Interpretation committees. A presenter and symposia organizer for several IAFP Annual Meetings, Mr. Wolff has also served on the Sanitarian Selection Committee and is active on the Dairy Quality and Safety PDG.

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## ELMER MARTH EDUCATOR AWARD

This award recognizes an IAFP Member for dedicated and exceptional contributions to the profession of educator.



Lee-Ann Jaykus (left) and Cathy Laube (right) present Donald Schaffner with the 2009 Elmer Marth Educator Award.

### Donald W. Schaffner

New Brunswick, New Jersey

Dr. Donald W. Schaffner is the recipient of the IAFP 2009 Elmer Marth Educator Award, which recognizes an IAFP Member for dedicated and exceptional contributions to the profession of educator. Dr. Schaffner is noted for his professional competence, magnitude of service, and exceptional efforts as a mentor to new faculty members.

An Extension Specialist in Food Science and Professor at Rutgers University, Dr. Schaffner also serves as Director of the Center for Advanced Food Technology.

With research interests that include quantitative microbial risk assessment and predictive food microbiology, Dr. Schaffner has authored more than 100 peer-reviewed publications, book chapters and abstracts. He has been the recipient of more than \$5 million in grants and contracts, most of which have been in the form of competitive national grants.

Dr. Schaffner has educated thousands of food industry professionals through numerous short courses and workshops in the US and more than a dozen countries around the world. He has served on expert committees for US National Academy of Sciences, the World Health Organization, and Food and Agriculture Organization of the United Nations, and has chaired two expert workshops on microbial risk for WHO/FAO.

An editor for the journal *Applied and Environmental Microbiology*, Dr. Schaffner also serves on the National Advisory Committee on Microbial Criteria for Foods (NACMCF). As a Boy Scouts of America volunteer, he is currently District Chairman of the Battleground District of Monmouth Council.

In addition to his IAFP service, Dr. Schaffner is active in several scientific associations. He holds a B.S. in Food Science from Cornell University and a M.S. and Ph.D. in Food Science and Technology from the University of Georgia.

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## HAROLD BARNUM INDUSTRY AWARD

This award recognizes an IAFP Member for their dedication and exceptional service to IAFP, the public and the food industry.



Vickie Lewandowski (left) and Tom Valitchka (right) present Allen Saylor with the 2009 Harold Barnum Industry Award.

### Allen R. Saylor

Washington, D.C.

As recipient of the 2009 Harold Barnum Industry Award, Allen R. Saylor is being honored for his dedication and exceptional service to IAFP, the public, and the food industry. Mr. Saylor is recognized internationally for advocating US dairy positions; his extensive knowledge of the dairy industry has placed him at the forefront of information development and knowledge dissemination regarding drug residue screening programs and milk and dairy product sampling and testing.

Mr. Saylor earned his BS in Biology from the University of Mary in Bismarck, North Dakota, and completed extensive course work in Civil Engineering. He spent ten years as the state's Assistant Dairy Commissioner, later joining the FDA as Senior Milk Specialist and the USDA as Dairy Marketing Specialist. Presently, as Vice President of Regulatory Affairs and International Standards for the International Dairy Foods Association (IDFA), Mr. Saylor's task force activities encompass the GFSI, HACCP, *M. paratuberculosis* (MAP), Aseptic, and 3-A Users and Equipment Suppliers; he also works with the MIF Regulatory and IDFA Codex Committees and the food defense and sustainability team.

Having initiated and maintained service on the Hazard Analysis Critical Control Point (HACCP) Implementation Committee through the National Conference on Interstate Milk Shipments (NCIMS), Mr. Saylor also serves its Aseptic Implementation Committee, and is an industry representative on Council III.

Since 1996, he has represented the US dairy industry on the IDF's Standing Committees of Standard of Identity, Microbiological Hygiene, and Residues and Contaminants, and is Deputy Chair of the IDF Standing Committee on Food Additives. He has participated on the official US delegation to the Codex Committees on Food Hygiene, Food Labeling, and Milk and Milk Products, and is serving as the IDF lead delegate to the Codex Committee on Food Additives and Contaminants.

In the late 1980s, Mr. Saylor chaired the North Dakota joint IAFIS-EHA state affiliate and represented North Dakota on the IAFP Affiliate Council. He has convened, moderated, or presented at ten IAFP/IAFIS symposium or mini-symposium; and served on the organizing committees for IAFP 2005 and the 2009 Raw Milk Consumption Symposium. In July 2009 he transitions to Chair of the IAFP Dairy Quality & Safety PDG.

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## STUDENT TRAVEL SCHOLARSHIP AWARD

Student Travel Scholarships are awarded to full-time students enrolled in a college or university food-safety related program. These students have demonstrated an interest in and commitment to food safety and quality. The IAFP Foundation provides funding for these scholarships, which were developed to encourage students to participate in Association activities.



*Stan Bailey (left) and Gale Prince (right) present Dominic Bagenda, Jeremy William Chenu, Gashaw Mersha Tessema, Hyo-Min Nang, Aaron Uesugi and Stelios Viazis with the IAFP 2009 Student Travel Scholarship Award.*

### **Dominic K. Bagenda** Future University Hakodate Hakodate, Hokkaido, Japan

**D**ominic K. Bagenda, a native Ugandan, currently teaches Science Communication at Future University Hakodate in Northern Japan, where he lives with his wife, Florence, and his four children. In March 2009, he was awarded his Doctorate degree by Hokkaido University in Japan.

A microbiologist by training, Mr. Bagenda has authored papers, presentations and posters at food science conferences in Europe, Japan, and America in the area of non-thermal methods of controlling food pathogens. He is especially interested in the use of food fermentates since they are time-tested and generally acceptable in many cultures.

Mr. Bagenda's aspiration is to develop simple food-safety communication for rural communities isolated by illiteracy, language and poverty. Recent advances towards the Millennium Development Goals have ensured that many native children in rural communities have access to English-based universal primary education. Mr. Bagenda believes that food safety communication can be simplified and disseminated to otherwise inaccessible natives through these multi-lingual, school-going children.

When not actively involved in his work and in charity drives to treat and educate victims of war, poverty, and disease in Africa, Mr. Bagenda enjoys playing badminton, biking, or interacting with informal learning communities of various ages in Japan and Africa. He considers the IAFP Annual Meeting an exciting opportunity to consult and learn from our generation's leading food scientists.

### **Jeremy William Chenu** University of New South Wales Gordon, New South Wales, Australia

**J**eremy William Chenu is currently a Ph.D. candidate in the School of Biotechnology and Biomolecular Sciences at the University of New South Wales (UNSW) in Sydney, Australia. There he also earned his BS (2007) in Food Science and Technology, with first class honors.

During his undergraduate studies, Mr. Chenu completed a research project on the application of a chromogenic plating medium for the simultaneous detection of *Cronobacter sakazakii* and *Salmonella* spp. from food matrices. In order to further his practical skills in the microbiology field, he joined a commercial testing facility, EML Consulting Services, as a full-time laboratory technician in 2007.



Under the supervision of Associate Professor Julian Cox, Mr. Chenu's research focuses on the "farm-to-fork" ecology and management of *Campylobacter* spp. in an Australian broiler chicken operation. He was a recipient of the Graduate Student Fellowship to attend the 28th International Workshop for Rapid Methods and Automation in Microbiology in Kansas, USA (2008).

In addition to IAFF, Mr. Chenu is an active member of the Australian Institute of Food Science and Technology (AIFST) and was a finalist for the 2008 Malcolm Bird Commemorative Award, which is the organization's most coveted honor for young members. He realizes that his involvement with professional societies will contribute to the development of a career in academia.

### **Gashaw Mersha Tessema**

Addis Ababa University  
Debre-Zeit, Ethiopia

**B**orn and schooled in Gonder, the 17th century capital city of Ethiopia, Gashaw Mersha Tessema earned his DVM (2001) at Addis Ababa University, Faculty of Veterinary Medicine, later working as an animal health officer in North Gonder. During that time, he also pursued ethno-veterinary medicine and control of CBPP under the project of Pan Africa for the control of Epizootics (PACE).

In July 2002, Mr. Tessema joined Alage ATVET (Agricultural Technical Vocational and Educational Training) College as a senior instructor, where he offers the courses Meat Hygiene, Veterinary Microbiology, Pharmacology and Basic Surgery. There, he has developed curricula for the courses Meat Hygiene and Anatomy and coordinated preparation of manuals for different subjects. Additionally, he has participated in the training of community animal health workers organized by the Catholic Church Integrated Development Program.

In September 2007, Alage ATVET allowed Mr. Tessema to continue his post-graduate program in the department of Tropical Veterinary Public Health, Faculty of Veterinary Medicine, at Addis Ababa University. After completion, he obtained financial support from the USAID SPS LMM project for his research at an export abattoir in Ethiopia on *E. coli* O157:H7 prevalence, distribution and shiga-toxin identification from sheep and goat feces, skin and carcasses, and carcass coliforms. So far, he is the first in his country to have identified shiga toxin 1 and 2 from goat carcasses.

Mr. Tessema, an active member of the Ethiopian Veterinary Association (EVA) and Ethiopian Animal Welfare Association, has also trained in teaching methodology and presented several seminars.

### **Hyo-Min Nang**

Dongguk University  
Seoul, South Korea

**H**yo-Min Nang is currently a graduate student in the Department of Food Science and Technology at Dongguk University in South Korea. She has been working as a teaching and research assistant, earning a great number of scholarships from the Korean government. Under Dr. Kwang-Geun Lee, she has studied "Quantitative Risk Assessment Model (QRAM) for *Staphylococcus aureus* in food Using Monte Carlo Simulation."

Ms. Nang's current research, approved by the Korea Food and Drug Administration, is centered on food safety and is one of the Korean government's leading programs. Her research constructs a QRAM in a computer spreadsheet using probability distributions, modeling the variability and uncertainty model of important risk factors to prevent outbreaks of staphylococcal food-poisoning from food. The work has been utilized as basal data to effectively manage the outbreaks of food poisoning in restaurants.

Additionally, Ms. Nang is interested in developing and designing preventive systems to minimize the risk of food safety and ensure safer food for consumers. At IAFF 2009, she is presenting two posters about her latest research results using a QRAM to set up standards for the food safety control and prevention of the outbreak of pathogenic contamination.

### **Aaron R. Uesugi**

Cornell University  
Ithaca, New York

**A**aron R. Uesugi is a Ph.D. candidate at Cornell University in Food Science, with minors in Food Microbiology and Applied Economics and Management. He received a BS in Food Science with a minor in Environmental Toxicology (2000) from the University of California, Davis. Following time spent as a Post Graduate Researcher in the Department of Food Science at UC Davis, he returned to complete his MS in Food Science (2004), under the direction of Dr. Linda J. Harris, on the thesis "The growth and survival of *Salmonella enterica* serovar Enteritidis phage type 30 on almond hulls and shells." He continued in the Harris laboratory as a Staff Research Associate until beginning his Ph.D. program.

Under the direction of Dr. Carmen I. Moraru, Mr. Uesugi's research focuses on the mechanisms of inactivation and microbial inactivation kinetics in the Pulsed Light treatment of food related microorganisms. Specifically, he has examined the use of Pulsed Light inactivation of *Listeria* in liquid and on stainless steel substrates as described by the

Weibull model, the reduction of *Listeria* on the surface of sausages, and evaluating the transcriptional gene response of *L. monocytogenes* to Pulsed Light treatment compared to continuous UV light. He hopes to identify the strengths and opportunities in the food industry for Pulsed Light.

Upon completion of his Ph.D., Mr. Uesugi plans to work as a food safety scientist in the food industry or government institutions.

**Stelios Viazis**  
University of Minnesota  
St. Paul, Minnesota

After spending his formative years in Athens, Greece, Mr. Stelios Viazis returned to the US to earn his BS in Food Science with an option in Food Chemistry (2004) from Rutgers University. Soon after, he pursued his MS in Food Science with a minor in Food Safety at North Carolina State University, working under Dr. Brian E. Farkas. His thesis research included using high

pressure processing for improved nutrient retention and microbial safety of human milk.

Mr. Viazis is currently a Ph.D. candidate in Food Science at the University of Minnesota, with a focus on Food Safety Microbiology and a minor in Public Health. He is currently working under Dr. Francisco Diez-Gonzalez and is involved in the USDA-funded project "Development of Sanitizers for Utilization in Organic Food Processing and Crop Production." His research entails developing highly efficient lytic bacteriophage cocktails specific for Enterohemorrhagic *Escherichia coli* (EHEC) and applying them onto EHEC Biofilms and EHEC-inoculated fresh produce for pathogen inactivation.

In addition to IAFP, Mr. Viazis is a member of ASM, IFT, and the IFT Student Association. Upon completion of his Ph.D., Stelios's immediate plans include obtaining a position as a food microbiology/food safety scientist in a research or regulatory setting. It is his ambition to someday become actively involved in assisting developing countries with food safety issues and proper utilization of their resources.

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## J. MAC GEOPFERT DEVELOPING SCIENTIST AWARDS

The Developing Scientist Awards Program encourages and recognizes the work of students and recent graduates in the field of food safety research. The program was established in 1986 to foster professionalism in students through contact with peers and professional Members of the Association. It also encourages student participation in the Association and the Annual Meeting.



*Indaue Mello-Hall (left) and Stan Bailey (right) with the J. Mac Geopfert Developing Scientist Award Winners (left to right) Emefa Monu, Cangliang Shen, Annmarie Buchholz, Anna Van Stelten and Laura Strawn. (Silvia Dominguez-Risco was not present.)*

### ORAL

1st Place – Anna Van Stelten

2nd Place – Annemarie Buchholz

3rd Place – Cangliang Shen

### POSTER

1st Place – Laura Strawn

2nd Place – Silvia Dominguez-Risco

3rd Place – Emefa Monu

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## AFFILIATE AWARDS



*Roger Cook (left) presents Mike Cassidy with the C. B. Shogren Award.*



*Roger Cook (left) presents Steve Murphy with the Best Affiliate Overall Meeting Award.*

### **C.B. SHOGREN MEMORIAL AWARD**

Ontario Food Protection Association

### **BEST AFFILIATE OVERALL MEETING AWARD**

New York State Association for Food Protection

### **BEST AFFILIATE EDUCATIONAL AWARD**

Texas Association for Food Protection

### **BEST AFFILIATE COMMUNICATION MATERIALS AWARD**

British Columbia Food Protection Association

### **AFFILIATE MEMBERSHIP ACHIEVEMENT AWARD**

Pennsylvania Association of Milk, Food and Environmental Sanitarians



*Roger Cook (left) presents Fred Reimers and Catherine Hall with the Best Affiliate Educational Award.*



*Roger Cook (left) presents Gene Frey with the Affiliate Membership Achievement Award.*

# IAFP 2009 BLACK PEARL AWARD WINNER

## Schnuck Markets, Inc.

St. Louis, Missouri

### Company Description

St. Louis-based Schnuck Markets, Inc. is a family-owned combination food and pharmacy retailer that has served customers for the past 70 years. Schnucks was founded in 1939, in a corner confectionery operated by Anna and Edwin Schnuck. The company has grown to include 105 stores and 15,500 associates in seven states.

Incorporated in 1953, brothers Donald and Edward Schnuck began to expand the company through acquisition as well as new construction. Over the years, the family developed a reputation for being innovators in the industry and for offering top quality perishables and high levels of customer service, leading to the tagline "The Friendliest Stores in Town."

Today, *Forbes* magazine reports that Schnucks is among the top 20 largest privately-owned grocers. The third generation is at the helm. The six children of Doris and the late Donald Schnuck continue to build on their dad's and uncle's reputations for customer and community service and remain committed to the company's growth as well as its evolution.

In addition to hallmarks of quality, variety, service and value, the Schnuck family realizes today's grocery customers want to learn more about their food – where it comes from, how it was processed, how to safely handle it and how to prepare and serve it. Schnuck's leaders remain committed to building and sharing their expertise with customers across all markets.

### Executive Summary

The year 2009 marks the 70th anniversary of Schnuck Markets, Inc., a family-owned grocery company founded in 1939 by Edwin and Anna Schnuck. Now in its third generation, the company is led by six siblings, the children of Doris and the late Donald Schnuck.

In their efforts to provide customers with the highest levels of service, Scott, Todd, Craig, Mark, Terry and Nancy Schnuck Diemer have remained in the forefront of major movements in the grocery industry. Chairman and CEO Scott Schnuck is a current member of the Food Marketing Institute's Food Safety Committee. Over the past six years, they

have taken food safety from a task force idea and developed a highly trained team of five food safety professionals.

The Schnuck's Food Safety team, led by former Health Department Supervisor Dianna Pasley, is responsible for all aspects of food safety. Schnuck's leaders have empowered the team to develop a culture where associates understand and respect the importance of food safety. They are committed to providing education and training that would enable every associate to build his or her knowledge of food safety and then share that knowledge with their customers and families.

The company's food safety activities date back before the terrorist attacks of 2001. When the national spotlight was focused on food safety and security, Schnucks was already ahead of the game, developing training and outlining a campaign for consumer and associate awareness.

### Training Starts at the Top

Presently, 90 percent of top management at Schnucks and nearly half of the company's 15,500 associates have been trained in food safety or have earned certification through the National Registry of Food Safety Professionals "Food Safety Manager Certification Programs" based on the 2005 FDA Food Code.

While training is ongoing across the company, associates are regularly involved in food safety programs and projects. Continuous improvement teams are always on the look out for ways to align programs with food safety standards. This training and elevated awareness have proven particularly helpful when handling weather-related challenges and other crises.

### A Culture That Respects Food Safety

Food safety is now a part of the fabric of the company and you see this in daily operations across all stores and facilities. However, because of the large scope of the company's facilities, food safety measures also are constantly challenged by crises of all types. Each event is an opportunity for them to learn and to reevaluate their processes.

For instance, in February 2008, an electrical fire forced the company's Washington, Missouri store to close temporarily. Over the next two weeks, food safety team members worked closely with local health department officials to handle the aftermath of a store fire. The smoke and soot necessitated the removal of all products followed by an extensive top down effort to clean and sanitize the facility before restocking.

Schnuck's store associates and the communities they serve often rely upon Food Safety for guidance in the midst of weather related power outages or property destruction that could potentially pose a health risk. The team contributed heavily to the development of a crisis manual outlining the steps to take to secure food in various crises. The elements of the manual have since been put to the test with successful outcomes in food safety.

The team maintains contact and partnerships with health departments across the company's geographic span. Because of their experience and prominence in the various markets, they also serve as media liaisons and are called upon to provide information regarding product recalls and answer questions on safe food handling and preventing foodborne illnesses. They deliver education and information through media responses, public service information announcements, in-store training programs, personal appearances and presentations. Periodically, they are also asked to explain or interpret regulatory rules or laws as those measures are being discussed, developed or enacted.

In 2005, the Food Safety team led a company-wide audit. Starting with all warehouse facilities and then on to the stores, they reviewed all procedures to ensure that each food storage or selling area offered the highest level of safety. At this same time, the company stepped up its community education and awareness by becoming one of the first food retailers in the country to introduce Nice-Pak sanitation hand wipes and hand foam at the check stands.

#### **Train-the-Trainer Expands Scope of Training**

Schnucks embarked upon a "train-the-trainer" program in 2007. Customer service center managers received comprehensive training on the importance of preventing cross-contamination by separating raw meats and chemicals from foods. They returned to their stores and trained all checkers and baggers on the new procedures. The company has found that customers are learning food-safety techniques by watching how food is handled at the checklanes. Schnuck's food safety teaches that bagging groceries is not only an art, but also, a science.

#### **Technology-based Recall Process**

Recent regulatory changes and requirements have led to a much-needed tightening of food safety practices throughout the food industry. These changes have also led to an increase in recalls.

Recognizing the need for a company-wide alert system that immediately notifies store associates of product recalls and helps determine how a recall is communicated to the public, the Food Safety team led the development of a computerized survey system that allows stores to receive information immediately and send a response including action taken and total product affected. This has cut hours out of the system and allows more time to work directly with suppliers and manufacturers of the recalled product.

#### **Three-tiered Auditing System**

Schnucks currently has a three-tiered food safety auditing system. It starts with comprehensive monthly audits at store level. These are reinforced by Kay Chemical audits every two months. Finally, the Schnuck's Food Safety team has developed and is in the process of launching a third system that involves a thorough check of every food production department to ensure food safety practices and sanitation standards are met.

#### **Building Consumer Confidence in the Food Industry**

The Food Safety team helps to build consumer confidence by working directly to resolve complaints or concerns raised by customers across all markets served. They provide counsel and answer questions regardless of whether or not the concerns originated at Schnucks or from a product carried at Schnuck's. Many times, the team will make "house calls" to pick up containers of food for inspection. They provide information and education on foodborne illness. Various members of the team are on-call for journalists who need to know more about food safety issues prior to writing or broadcasting information. They are often used as resources for news stories locally and nationally.

#### **Into the Future**

Although it continues to grow, at 105 stores, Schnucks is not a large grocery company, but what it lacks in size, its leaders make up for in vision and in the courage to take bold initiatives in the interest of service to their customers.

At Schnucks, commitment remains strong because company leaders know that they must work hard to stay ahead of food safety concerns complicated by ever-changing global influences that impact communities and store environments.

Schnuck's associates will continue to help develop, shape and mold a healthy respect for food safety by remaining open to continuous information and education over a variety of topics. Schnuck's leaders believe that as grocers and responsible corporate citizens, it is their responsibility and privilege to do so as our company continues to grow and to serve more customers.

Leaders say that Schnucks has come a long way in serving customers, but when it comes to food safety awareness and education, they have only just begun.

# IVAN PARKIN LECTURE

## *Navigating Food Safety through Times of Economic Chaos: A Call to Action*

Dr. Paul A. Hall

AIV Microbiology and Food Safety Consultants, LLC  
Hawthorn Woods, Illinois

*"How paramount the future is to the present when one is surrounded by children"*  
– Charles Darwin (1809 – 1882)

The current chaos in global markets has had a ripple effect across all segments of the economy including the food sector. Government statistics show that the average US Producer Price Indices for all commodities were significantly down in 2008 compared to the year before. US net farm income is projected to be significantly down in 2009 compared to 2008 and overall food sales in the US were down 6.0% for food consumed at home and down 4.5% for food consumed away from home compared to 2007. Overall, US economic growth is shrinking in 2009 due to weak housing construction, higher long-term market interest rates, deteriorating household and business balance sheets, rising unemployment and falling personal income all translating into falling consumer spending. According to the US Census Bureau, US retail and foodservice sales for May 2009 were 9.6% below May 2008 with all retail trade sales off 10.8% from a year ago. US consumers are spending a smaller percentage of their income on food. Food expenditures as a share of disposable income was 9.6% in 2008 compared to 11% in 1988 (USDA–ERS).

From a global perspective, the strong growth in total world trade over the past 5 years is declining as world economic growth is projected to drop to 1.2 – 1.5%, well below the 2% growth rate seen as the standard for a world recession. Agricultural imports into the US has average >10% annual growth over the past 5 years, however, for 2009 agricultural imports will climb only about 2.1% (USDA–ERS). Increased competition in global grain markets, much lower prices for grains, oilseeds, and cotton and weaker demand combined with a stronger dollar have reduced US export values. The USDA estimates that US exports will decline over \$13.5 billion in 2009 (14.4% decline) (USDA–ERS). Global food prices have risen over 80% since 2005 (wheat +141% and rice +130%) and are projected to continue to rise in the future.

As a result of the global economic downturn, the Industrial Research Institute (IRI) anticipates flat Research and Development spending in 2009. There is clear trend in all segments to shift R&D away from support of existing products to developing new products. Some good news from the food industry perspective is that

directed basic research is expected to decline in all segments except for food and tobacco. While the food industry, historically, has not been a leading investor in R&D spending (expressed as a percentage of sales), at least, in 2009 spending is not projected to decline. Capital spending is projected in the food industry to be down 2.9% ([www.foodprocessing.com](http://www.foodprocessing.com)). Seven of the top 20 companies in *Food Processing Magazine's* 2009 survey are cutting capital investment by more than 28%. Job losses are widespread across the major industry sectors including the food industry with large declines occurring in manufacturing, professional and business services, and construction. In June 2009, the overall US unemployment rate was at 9.5% with 14.7% unemployed individuals. While layoffs are continuing in the US food manufacturing sector, it has not been hit as hard as other sectors (US Department of Labor). Food manufacturing employment was down only 0.68% in June, 2009 compared to a year ago versus job losses of 12.2% for total manufacturing and 13.7% for construction.

Given the chaotic economic climate around the globe, not all is bad. The great 13th Century Persian poet Sa'di said that "When fortune closes one door, it opens another" (The Maxims of Sa'di). In the context of the food industry this is exemplified by the explosion in sales of private label products (store brands). Consumers hit by job losses, shrinking retirement investments, and the daily depressing economic news are modifying their shopping habits in two major ways: (1) consumers are shopping at stores they perceive as low price retail leaders (e.g., Walmart, Costco and other clubstores, and Aldi's) and (2) budget conscious shoppers are increasing their purchases of private label brands. A June 2009 survey conducted by the Private Label Manufacturer's Association shows that the market share gains posted for private label products during the recession will hold up after the economy recovers. While private label growth has slowed in recent months, year-ago share gains continue to hold steady.

In addition to the economic and its impact on the food industry there are number of other factors that impact food safety:

- Globalization of our food supply
- Intensive animal husbandry and agricultural practices
- Centralized food processing and manufacturing

- Demographic changes and consumer behavior
- Changes in the microbes themselves
- Climatic and environmental changes
- Increased regulatory and public scrutiny

In the US, we are growing our population by over 3 million people per year but we are losing over 3 million acres of farmland per year due to urban sprawl. By 2015, nearly half of the world's population will live in water-stressed countries. Water quality and availability will be the next major global issue facing society in the future. There is a steady stream of major foodborne outbreaks and product recalls in the US which continue to undermine consumer confidence in the safety of our food supply. Asia is quickly gaining market share in food exports to the US. China is becoming a major supplier of vegetables to the US market, ranking third behind Mexico and Canada. Vietnam is now the largest supplier of tree nuts to the US surpassing India in 2008. The sourcing of ingredients from developing nations present unique issues as the recent melamine issue demonstrated. All of these factors present significant challenges to the food-safety professional. Combining these factors with the current chaotic global economy the challenges to food safety seem very daunting.

As food-safety professionals, it is incumbent upon us to pull together and develop a game plan to help the food industry navigate through these rough waters. As food safety professionals, we must:

- View food safety as a "sacred responsibility" – we must act as the moral compass for our organizations
- Stay focused on the "vital few" – know what's important and what priorities on which we should spend our precious resources
- Learn to speak in the "language of business" – know how to translate "Food Safety-ese" into "MBA-ese". Senior management must view food safety as a smart investment and not simply a cost to the business
- Instill a passion for food safety throughout the organization – create a sense of personal empathy for food-safety issues. We want to keep our children, our parents, grandparents, and other family members safe
- Clear the fog on food-safety issues – be able to effectively communicate the "why", "what", "when", and "how" of what needs to be done to address food safety issues
- Take a holistic, global view of food safety – understand the complexities of our global food web and how impacts food safety
- Demand strong cooperation and collaboration among industry, government, and academia on food safety issues – share best practices, support strong research programs, help developing nations address their unique challenges
- Drive education, development, and training of the next generation of food safety professionals – get kids interested in our profession at a young age
- Anticipate our ever-changing food-safety management landscape – change is the one constant

in business. Food-safety professionals must be deft in anticipating changes that can impact the safety of our food supply

The food industry must be committed to the highest possible standards of food safety throughout its operations and should take significant measures to that end:

- Each food company should have an established senior leadership position to bring additional focus to develop a culture of food safety throughout the organization
- Companies should use external expert food safety advisory bodies and process authorities to provide independent guidance on issues of food safety
- Companies should have the proper checks and balances to ensure that their suppliers and co-manufacturers are in compliance with established food safety standards
- HACCP and its associated pre-requisite programs should be the cornerstone of a company's food safety culture
- Companies must commit to making significant capital and resource investment to ensure the production of safe food
- Companies should sponsor leading-edge research into the control of pathogens in food products from farm to fork
- Companies should display proactive leadership by participating in external committees, trade organizations, and research/educational institutions to promote food safety
- In-depth safety and quality system and capabilities assessments should be conducted across the manufacturing network using cross-functional teams and independent technical experts
- Overall product recall and traceability processes should be periodically assessed across the supply chain
- Organizational capabilities across operations should be assessed to ensure the proper allocation of precious resources (personnel and materials) with a focus on food safety

In looking to the future, CEOs need to realize that now is not the time to cut corners in food safety. They need to realize that food safety is a smart investment that can pay dividends, not only in cost avoidance, but in enabling practices that can contribute directly to the bottom line. Food-safety professionals across all sectors of industry, government, academia, and consumer groups must rally to make the case that investment in food safety is imperative, now more than ever, given our economy and the global nature of our food supply. Failure to heed this call to action will continue to lead to the failure of food companies and the failure to protect our consumers. If we, as food-safety professionals, do not champion this call to action, then who will? If we do not champion this call to action, then we have failed in our sacred responsibility as food-safety professionals. If, however, we do our jobs with passion, conviction, and tenacity, we can be successful in navigating today's stormy waters and help ensure a bright future for our children.



# JOHN H. SILLIKER LECTURE ABSTRACT

## *The 2008 Irish Dioxin Crisis: A Public Health, Food Safety, Economic, Legal, or a Risk Communication Challenge?*

Dr. Patrick Wall

Professor of Public Health  
University College Dublin

School of Public Health and Population Sciences  
Belfield, Ireland

Former Chairperson of the European Food Safety Authority

That the food chain is only as secure as its weakest link was once more exemplified in December 2008 when, as a result of pig ration contaminated with dioxin being fed to a subset of Irish pigs, a total recall of all Irish pork products produced between 1st September to 6th December 2008 was initiated. This incident highlighted the many challenges currently faced by the modern food industry. These high profile recalls undermine consumer confidence in the safety of the food supply, in industries' commitment to produce safe food and in the regulatory agencies' ability to police the food chain. It is important that the lessons learned are widely shared if future such incidents are to be prevented.

The agri-food sector is an important indigenous industry to the economy of Ireland, a small country of 4.5 million people. It is a major food exporting country distributing pork, beef and lamb as finished products, and as ingredients, both inside and outside the EU and food exports were worth \$11.36 billion in 2008. As Ireland has no heavy industry, it prides itself with its "clean green" image and markets its output under the brand of "Ireland the Food Island". It is recognized as the unspoiled back garden of Europe and in addition to food exports has a thriving eco-tourism industry. Ireland prides itself with the regulatory infrastructure in place to both protect consumers' health and support its food industry, and in June 2008, the Irish Food Safety Authority was awarded a Certificate of Honor from the World Health Organization "in recognition of its outstanding contribution to the promotion of human health through food safety".

However, "pride comes before a fall" and a country's reputation is only as secure as the standards of its weakest operator. In this incident, a recycling plant converting waste human bread into animal feed was using a direct flame dryer in the process. The burner was fuelled by recycled mineral oil, which was contaminated with transformer oil, and the fumes contaminated the rations with PCBs and dioxin. The problem emerged when random tests of pork fat,

sampled as part of the national residue monitoring program in November 2008, revealed PCBs. The source farm of this pork was identified and samples of the rations fed were taken for analysis. PCBs were identified in one component, recycled bread, sourced from this particular mill. The mill provided this bread meal to 10 pig farms and these farms and the mill were closed. (All pigs on these farms were subsequently slaughtered and the carcasses and remaining meal sent for incineration.) Although only 10 of the Ireland's 400 pig farms were identified as having received the contaminated ration, these farms contributed 8% of Ireland's national pig production.

Library samples of stored batch samples of the bread meal in the recycling mill indicated that the contaminated ration had been produced over a period from the end of August to the end of September 2008. This coupled with results from a Belgium processor who had noticed rising dioxin levels (albeit still within the legal limit) in composite pig fat derived from trimmings from several countries from mid September to the end of November 2008, suggested the problem of contaminated pork in the marketplace was likely to have started in September 2008. The legal limit for dioxins in animal feed in the European Union is 0.75 picograms/gram and the level identified in the contaminated bread meal was 5,200 picograms/gram, and the legal limit in pig fat is 1 picogram/gram whereas the levels detected were from 80 to 200 picograms/gram. A picogram is  $10^{12}$ , or 1 part per trillion, or 1 second in 31,699 years. The levels deemed likely to create adverse health effects are based on prolonged exposure over a lifetime (40 years) and the legislative levels have a margin for safety.

In 1999 in Belgium, a small amount of animal ration was contaminated by Dixon containing oil and a failure by the authorities to take action caused intense consumer anxiety. The Government was accused of concealing information from the public and citizens were angry that they were not informed that there were "toxic chemicals in the food chain". The Ministers of

Health and Agriculture were forced to resign and finally the Government fell as a result of their mismanagement of the situation. The EU Commission intervened and due to an inability to identify the farms where the contaminated ration was fed, and the destination in the food chain of the livestock from these farms, it banned all Belgian dairy, chicken and pork products from the marketplace, pending the results of investigations as to the extent of the problem. The USA reacted by banning certain categories of food from the entire EU. The crisis cost the Belgium food industry in excess of \$1.5 billion and it took over 6 months for the market to recover. Despite these drastic consequences, subsequent human health studies have not demonstrated any adverse human health effects. This incident, combined with the initial mis-management of the BSE crisis, precipitated a reform of EU Food Law, the creation of independent national food safety agencies and the creation of the European Food Safety Authority to undertake scientific risk assessment to underpin EU policy and regulatory decisions with robust science.

The Irish Government took the opposite approach to the Belgian authorities and went public as soon as they were made aware that there were dioxins in a subset of the national pork output. By ordered a total recall in this incident, ongoing exposure was stopped and the public's health was no longer being put at risk. A total recall proved necessary because of the requirement to recall product from a three-month production period, and because of the degree of comingling of pork products in secondary processing, a more targeted recall of product from only the 10 implicated farms was not possible. Products containing pork as an ingredient, from hot dogs and salamis to pizzas and ready-to-eat pre-prepared meals, came under the spotlight and an economic impact was felt by many companies distant from the pig processing sector. For some, in addition to the cost of the recall, this included the additional cost of locating contingency supplies to prevent stock-outs by their retail and commercial catering customers. The commercial survival of many companies was under threat and the Irish Government had to provide financial assistance of \$287 million to prevent the demise of many companies and the associated jobs.

Traceability, while a component of every food safety management system, is not a guarantee of safety. The legal requirement for traceability in the EU is simply one step forward and one step backwards in the food chain and each food business operator must know exactly who they purchased product from and who they sold it to. The Irish system was fully compliant with EU requirements and similar to that in operation throughout the EU and most of the rest of the world.

Food is globally distributed and so also is the media, but the latter is a lot faster and is open for business 24 hours per day, seven days per week. For over fourteen days, a tsunami of sensational adverse publicity was associated with this incident. Both conventional and, the newer more penetrating, digital media have the potential to amplify risk-elevating

consumer anxiety, customer anger and brand and reputation damage. This can be mitigated but not prevented if the risks are managed and are seen to be managed, decisively and rapidly. The legal limit for dioxins in pork fat in the EU is 1 picogram per gram and attempting to communicate the risks, if any, associated with this level of contamination plus the concepts of bio-accumulation and body burden and the need for continued exposure to result in adverse health effects, in an increasingly sound-byte dominated media, proved extremely difficult.

Many countries have national food safety agencies focused on consumer protection and they demonstrated their worth by providing science-based reassurance, and helping to clarify the issue for their citizens. The well publicized scientific risk assessments undertaken by the Food Safety Authority of Ireland and the European Food Safety Authority, utilizing existing data on potential exposures from total diet surveys, contributed to calming the situation and informing risk managers. Unlike the similar incident in Belgium in 1999, which dragged on for several months, this incident was resolved within weeks. Identification of the problem and taking decisive action most likely ensured that there will be no adverse human health effects. However, there has been residual damage to many industries and to consumer confidence, and there are numerous lessons for the animal feed sector, the pork sector and for the wider food industry.

The recycling mill involved in this incident was deemed a "low risk operation" by the Irish regulatory authorities, meaning it was inspected only once per year. As it was animal feed, it did not fall under the responsibility of the Food Safety Authority and was licensed by the Department of Agriculture. This incident, like many similar ones, raises the question of the role of the regulators in the event of something going wrong. "If a food business buys product from premises registered with, and inspected by, the regulator agency, have they a legitimate expectation that everything is OK?" Food business operators bear the primary responsibility for producing safe food and it is the role of the regulators to verify that they have appropriate controls in place, but unfortunately, this does not always happen. Therefore, a business intent on protecting its reputation and brands would be well advised to seek the added reassurance of sourcing their raw material from third-party audited assured suppliers.

In most jurisdictions, policing of the food chain could be improved as equal risks along the food chain do not receive the same amount of attention from the national inspectorate. Inspection frequency and intensity varies across the food chain, ranging from some businesses having a permanent presence of inspectors, to others being inspected annually or even less frequently. Some of this discrepancy results from legal requirements, however, it behoves countries to look at how they deploy the resources of their national inspectorates to deliver the most benefit in terms of consumer protection and protection of the food industry. Just like requesting a food business

FIGURE 1.

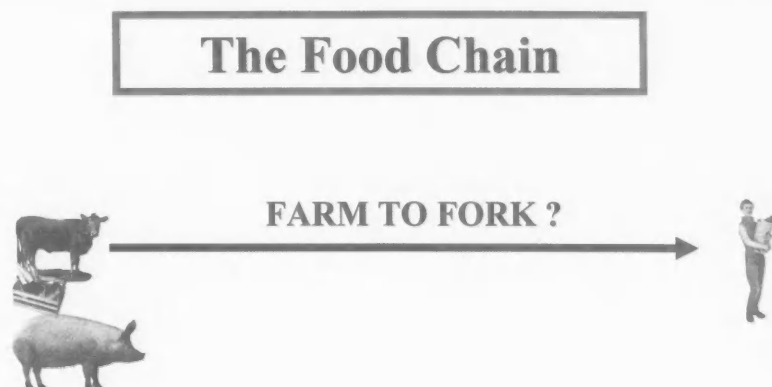
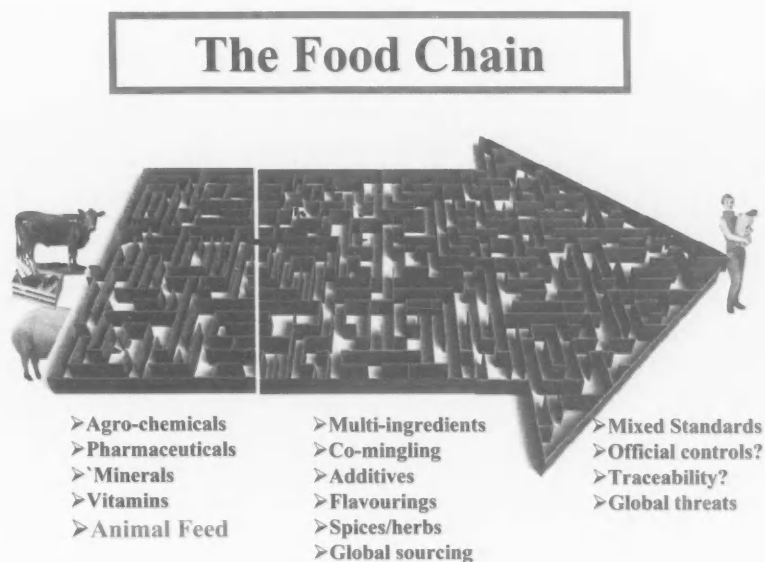


FIGURE 2.



to undertake a HACCP analysis of their process, the regulatory agencies should undertake a risk categorization of food and feed businesses along the entire food chain. Businesses should be categorized on the basis of:

- Hazards associated with their raw ingredients
- Hazards associated with the process
- Hazard associated with their finished products
- Food Safety Controls and management capabilities
- Consequences of a major non compliance

Some food businesses are victims of their own success and outgrow their management capabilities

and plant facilities, posing a public health risk whereas others introduce requirements in excess of the legal requirements and subject themselves to third-party audits. There is a move by the competent authorities from inspecting premises to auditing food safety management systems. The latter satisfies the authorities that the food business has procedures in place to produce safe food on an ongoing basis whereas the former just gives a snapshot of how things are on the day of the visit. This move needs to be accelerated to ensure the activities of the national inspectorates are adding maximum value. One good system's audit can be much more effective than numerous inspections. The food chain is only as secure as its weakest link

and there should be no gaps in the continuum of supervision from animal feed mills to the point of sale to consumers.

Attempting to recall ingredients or product from the global supply chain highlights that the concept of the food chain from farm to fork being a simple straight line (Fig. 1) and the idea that it might be possible to put the name of the farm of origin on processed products are naïve in the extreme. The modern food chain is more like maze (Fig. 2) than a straight line with global sourcing of agrochemicals, pharmaceuticals, minerals, vitamins and animal feed at farm level. Further along the chain, many foods contain multiple ingredients, often from many countries and even continents, routinely there is comingling of products from several processors in the finished food and in addition flavorings, additives and spices are routinely sourced from a global market place. Furthermore, not all processors have the same standards and not all countries have the same controls or enforcement capabilities. Recalls, when

ingredients are contaminated, whether they are spices or larger components in processed products, are extremely difficult and costly. An inability to distinguish uncontaminated from contaminated food in the supply chain and marketplace often leads to the recall and destruction of large quantities of perfectly safe food and compounds consumer anxiety.

We truly live in a global village and the health of citizens and company brands, in one country are often dependent on the controls in operation in another so harmonization and consistency are the name of the game. The problems we face in the modern food chain are similar in all jurisdictions and require global solutions with similar standards across the board and both good communication and collaboration among all national and international agencies.

All industry stakeholders need to step up to the plate as prevention is better than crisis management — “Ask not what the regulators can do for you, but what you can do for yourselves”.

# OUR EXPERIENCES

## BY THE IAFP 2009 STUDENT TRAVEL SCHOLARSHIP AWARD RECIPIENTS

**Dominic K. Bagenda**  
Future University Hakodate  
Hakodate, Hokkaido, Japan



**I**n my final year at graduate school in Japan, I was anxious about my relevance to Africa's enormous food-safety challenges. IAFP provided a perfect and timely answer in the form of an IAFP 2009 Student Travel Scholarship. It was an opportunity to network with 1,800 of the world's top food safety

professionals. I arrived in Grapevine, Texas, jet-lagged but excited and determined to learn.

Learning often requires that we first unlearn. I had a lot of unlearning to do. It started with the pre-meeting workshop on building a food-safety culture. I now realize that if Africa is to earn her place in the global food chain, food-safety professionals must build food-safety cultures, not programs. Food safety must also be viewed as an investment, not an expense. African food-safety professionals must learn to effectively identify problems and act on them decisively. African stakeholders must understand that trade opportunities like African Growth Opportunities Act (AGOA) are not blank checks but contracts that demand traceability, transparency, and due diligence. There are audits and standards that must be met if Africa is to become a global food supplier like Brazil. The role of food safety professionals in Africa has never been more crucial and tough.

Tough is the only way to describe the process of deciding where to be at IAFP 2009. Excluding the necessary opening and closing lectures, there was always an equally good place to be. I signed up for two concurrent pre-meeting workshops and spent days shuttling between concurrent sessions. Many speakers effectively used real life stories, science, and humor to leave a lasting impact. The posters were also very informative and all had to be seen. The exhibitors had a lot of information and technology that made food microbiology sound so easy.

I am grateful to the IAFP Executive Board, staff, Dr. Benjamin Chapman (my mentor), and the IAFP members who helped me feel at home in Grapevine, Texas. Thanks to the superb air-conditioning, I did not have to worry about the Texas heat either. As I prepare for IAFP 2010 in Anaheim, it is my earnest prayer that future IAFP Annual Meetings will have more participants from Africa. Only then will we raise the "critical mass" needed to help Africa's food safety systems.

**Jeremy William Chenu**  
University of New South Wales  
Sydney, New South Wales, Australia



**R**eceiving a Student Travel Scholarship to attend IAFP 2009 in Grapevine, Texas, was a great pleasure and honor. I am very grateful to IAFP for offering emerging food-safety professionals the opportunity to participate in a conference that attracts internationally recognized researchers,

government officials and industry personnel—it truly is the "Golden Globes" of the food-safety community. In particular, I would like to acknowledge Leilani McDonald and the Executive Board for their support, coordination, and organization of the awards program.

IAFP 2009 provided several invaluable educational and networking experiences of a diverse nature. The meeting appropriately commenced with a very informative and humorous Ivan Parkin Lecture, presented by Paul Hall, on the impact of the current economic climate on food safety. At the pre-meeting Student Professional Development Group (SPDG) Luncheon, Dr. Stephen Grove reflected on his journey through graduate school and helped justify my decision to begin research in the food-safety area. Along with the Welcome Reception, Monday Night Social, and SPDG Mixer, the SPDG Luncheon provided an environment that encouraged the forging of new relationships and revisiting of past friendships with the broad mix of attendees.

The latest advancements in highly relevant food-safety issues across the globe were addressed by the symposia, technical, and poster sessions. Coverage of scientific content included new information on the microbial ecology of foods, novel qualitative and quantitative analytical techniques, and the status of current intervention strategies and regulatory affairs. I was fortunate enough to co-monitor a number of technical sessions and symposia, which will appear in an issue of *Food Protection Trends*. In addition, the IAFP 2009 Exhibit Hall showcased cutting-edge technology used in the food safety field and served as the perfect interface to build industry and research ties.

The information that I have gained from my participation at IAFP 2009 has expanded my knowledge, both from an academic and life-skills perspective. This experience will no doubt assist in my continuing development as a food safety professional. I encourage all other young food safety scientists to take the opportunity to attend future IAFP Annual Meetings.

### **Gashaw Mersha Tessema**

Addis Ababa University  
Debre Zeit, Ethiopia



**I**t gives me great pleasure to thank the International Association for Food Protection for giving me such an amazing opportunity to attend its Annual Meeting in Grapevine, Texas. It was an honor to be one of the IAFP 2009 Student Travel Scholarship recipients. This was a memorable event

that happened in my academic stay and opened a new chapter in my professional career.

As it was my first time to attend such a huge meeting in the field of food safety, the lesson I obtained from the scientific content of the technical sessions, posters, symposia, etc. was amazing. It gave me a broadened perspective of food safety and guides me in what to do next. The meeting was an ideal place for me to develop many connections within the Association and to meet many professors, talented researchers, and representatives from governmental and non-governmental organizations.

Thanks to the Program Committee and all the contributors, the technical aspects of the meeting and each social event—including the Cheese and Wine reception and Student Mixer—were like a dream to me. The sharing of complementary ideas and novel approaches with other students and professionals helped me to decide to be an IAFP Member throughout my life. Once again, I thank the Association for their organization in providing me this wonderful opportunity.

### **Hyo-Min Nang** Dongguk University Seoul, South Korea



**A**tending IAFP 2009 as a Student Travel Scholarship recipient was an honor, and I was provided so many benefits. I thank the Association for giving me the opportunity and for making this award available.

As I expected, IAFP 2009 was a particularly enriching experience

for me. First of all, I was very interested and motivated when I found lots of reports similar to my own research, and people who are working in same area as me. It was a great experience to discuss my poster during my presentation. Secondly, I had the opportunity to meet my mentor, Dr. Donald Schaffner. He kindly gave me advice and explained in detail about risk assessment in the area of food safety. Finally, the scientific content of the posters, technical session, symposia, and lectures helped to develop my own research.

I have been provided with a broadened perspective of food safety and new contacts, which will inspire my own research in food safety.

### **Aaron R. Uesugi** Cornell University Ithaca, New York



**I** was honored and privileged to be a recipient of a Student Travel Scholarship to attend IAFP 2009. I sincerely appreciated the opportunity to attend the meeting and thank IAFP for making the Student Travel Scholarship possible. I am also grateful to David Tharp and the Executive Board for their kindness and

professionalism, Leilani McDonald for her organization and communication, the new and old members of the Student Professional Development Group, and Dr. Vijay Juneja, my mentor, for inviting me to several committee meetings, introducing me to countless friends and acquaintances, and providing wonderful professional and personal advice that I will keep with me throughout my career.

The scientific research presented at the technical sessions, symposia, roundtables, posters, and debate were excellent: covering a broad range of relevant topics, regulator issues, consumer concerns, and reflecting and updating knowledge regarding past outbreaks while laying the foundation to address future concerns. The meeting provided an outstanding site to meet fellow researchers and scientists addressing public health, exchange ideas, broaden knowledge bases in new fields, and learn from the first-hand experience of our peers.

At the meeting, I was able to present a poster on the pulsed light treatment of *Listeria* and *E. coli*. The presentation of my research allowed me to make new contacts and gather new ideas to follow and explore, while introducing and sharing my knowledge of my thesis work to fellow colleagues unfamiliar with the technology.

Having neither attended nor presented at IAFP for several years, this meeting reminded me of how wonderful a conference IAFP consistently organizes year after year. The meeting truly brings the members and leaders of food safety together, while graciously welcoming students into the community. I look forward to attending future meetings, and encourage other students with an interest in food safety to attend.

### Stelios Viazis

University of Minnesota  
St. Paul, Minnesota



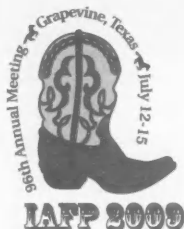
As an IAFP 2009 Student Travel Scholarship winner, I am deeply grateful to the organization for this honor. The scholarship provides the opportunity for students to attend one of the leading scientific conferences in food safety. Having this be my first IAFP conference, I must admit I was overwhelmed

by the volume as well as the quality of information presented and the extensive networking opportunities available. IAFP 2009 was an immensely enriching experience for many reasons. I attended many symposia that were relevant to my research as a Ph.D. student, but I also got a general feel for the trends and new findings in the field of food safety.

The conference for me started off by attending the Food Safety Education and Retail Food Safety and Quality Committee Meetings, followed by the Student Luncheon and the Student Professional Development Group. During the Opening Session, I had the opportunity to witness the very entertaining talk by Dr. Paul A. Hall as part of the Ivan Parkin Lecture. His topic was "Navigating Food Safety through Times of Economic Chaos: A Call to Action," and was delivered with much theatricality and zeal; going as far as recreating a Johnny Carson skit as "PaulNac the Magnificent."

The meeting included a series of oral (Technical, Roundtables or Symposia) or poster sessions of impeccable educational value. By far, the most impressive aspect of the conference for me was its scientific value, as I found information relevant to my research—of bacteriophages and Enterohemorrhagic *Escherichia coli* (EHEC), in particular. During the meeting, I presented a poster on the isolation and characterization of lytic bacteriophages against EHEC.

As a matter of fact, after attending a few presentations relevant to my work, I came back to the lab with new ideas and a renewed sense of confidence. IAFP 2009 in Grapevine, Texas, was perhaps the most interesting and fulfilling meeting I have ever attended, and I will actively pursue coming back year after year.



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# SESSION SUMMARIES

Members of the IAFP Student Professional Development Group assisted the Convenors by serving as Session Monitors at IAFP 2009. Student Monitors prepared the following session summaries for presentation in *Food Protection Trends*.

## SI – ICMSF Symposium on International Developments in Food Safety

Sarah Markland, University of Delaware

Anderson de Souza Sant'Ana, University of São Paulo

Leon Gorris, from Unilever, began the symposium with a presentation on the importance of risk-based analysis and management in the food industry. He explained the different levels of food safety management at the country and operation level. Risk analysis enables microbiological criteria and standards and ultimately a food safety objective. He stressed the importance of assessing the risks in every stage of food production in order for producers to maintain an effective food safety management program.

The next speaker, Marcel Zwietering from Wageningen University, discussed methods for determining the quality and performance of microbiological criteria. There is often the illusion in the food industry that a negative test concludes that the sample is completely free of pathogens – this is not true. Food sampling plans should be based on a pre-specified food safety objective. A larger number of samples should be tested in order to reduce the probability of obtaining a negative result. By improving the performance of microbiological criteria, the industry may be able to detect problems in a more effective and timely manner.

Katherine Swanson, from Ecolab Inc., discussed the use of testing in food safety management. She presented the current project of the ICMSF titled Book 8, which is still in progress. The objectives of Book 8 are to update testing criteria, recommend other useful tests for specific products and to address food safety and quality. The two main components of the book include principles and commodities. She explained that microbiological testing assesses food safety, verifies HACCP, and can even help identify and control a food safety problem. Types of testing include in process testing, environmental testing, shelf life testing, and end-product testing. Looking at trends in data of all aspects of food production can present possible reasons for contamination of a product. The ICMSF Book 8 project is still in the works, as Dr. Swanson explained, and all recommendations are not yet final.

The next three speakers made their presentations based on the ICMSF Book 8. The presentations focused on microbiological testing from "farm to fork." Dr. R.B. Tompkin presented testing criteria to address meat and poultry safety. Dr. J.M. Farber focused on sampling and testing concerning seafood safety, while the last speaker, Dr. Robert L. Buchanan, focused his presentation on the produce safety. Specific examples on the commodities were presented and discussed that are draft of the ICMSF book 8. Main points showed

in these presentations were that testing a low number of samples in the end product is not the best option to assure that a specific food, for example, is free from a determined pathogen. The approach must consider the microbiological testing of the whole food production chain so as to help to know from where a microbial contamination comes.

## S2 – Sterilant Gas Decontamination of Food and Environments and Emerging Technology

Amrita Pathania, Auburn University

The session on sterilant gas decontamination of food and environments and emerging technology was opened by Jeffery L. Kornacki from Kornacki Microbiology Solutions, Inc., who introduced the potential of sterilant gas technologies for disinfection.

Development of microbial growth niches in equipment and facilities continues to be a frequent source of contamination. Many sites are difficult to disassemble for effective cleaning and sanitization and they entrap microbes which multiply to high numbers and cause contamination of food. Gases can penetrate easily into the cracks and niches in food and in facilities where entrapped microbes could be missed by conventional techniques of cleaning and sanitization.

Bassam Annous, USDA-ARS, talked about the need for such a method of sterilization which has developed from the use of many items that cannot be subjected to heat, radiation, or liquid chemical sterilization. The following advantages were noted: sterilization is at low temperatures thus avoiding damage to heat- and moisture-sensitive materials; objects or items can be sterilized in their containers or packages, diffusion of some gaseous sterilants through containers of plastic, paper, or fabric eliminates problems of removal of sterilant; gaseous sterilants penetrate into areas not reached by liquids.

There is an increase in the consumer-driven demands in the food industry. The first is the provision of fresh, natural foods requiring minimal preparation and the second is the control of food safety with no artificial additives, hormones or antibiotics. Research is being done keeping these trends in perspective.

The efficacy of sterilant gases to decontaminate fruits and vegetables was discussed by Joseph Frank. The potential of Allyl Isocyanate isolated from horseradish and mustard on tomato skin was discussed. Packaged sliced tomatoes are a popular product for institutional foodservice. Slicing provides opportunity for exterior contaminants to reach inside.

Ozone gas has shown to slow ripening, suppresses fungal growth, increases shelf life and there is no tissue damage.

In 1997, through the efforts of the Electric Power Research Institute (EPRI), FDA granted ozone with the status of "Generally Recognized As Safe" (GRAS) as a sanitizer and disinfectant for foods. Ozone is particularly suited to the food industry because of its ability to disinfect without adding any chemicals to the food being treated, or to the food processing water and atmosphere in which food is stored.

In aqueous solutions, ozone can be used to disinfect equipment, process water, and some foodstuff. In gaseous form, ozone can act as a preservative for certain foods products and can also sanitize food packaging materials. The use of ozone in food processing has been allowed and accepted in Japan, Australia and France. Mark Czarneski from ClorDisys Solutions Inc, discussed the decontamination of a large facility contaminated with *S. Newport* by using chlorine dioxide gas.

Research has shown the antimicrobial effect of basil and thyme essential oil and its major constituent's thymol, p-cymene, estragol, linalool, and carvacrol by using an agar well diffusion assay. Vaporized essential oils of oregano, thyme, cinnamon are very effective against food-borne pathogens. Thyme oil has been found to be effective against *Listeria*. Cinnamon oil is effective against fungal growth. Treatment with antimicrobial gases significantly reduces the pathogen level but challenges for the widespread industrial application still remain. The symposium discussed the latest advantages, disadvantages, legal aspects and the efficacy of emerging sterilant gas technologies to decontaminate foods and facilities.

### S3 – Harnessing Irradiation for Marketplace Today

*Reshani Nisansala Senevirathne, Louisiana State University*  
*Visvalingam Jeyachandran, University of Manitoba, Canada*

Dr. Daniel L. Engelson from USDA Food Safety and Inspection Service (FSIS) was the first speaker for this session. His topic was "FSIS Approval of Irradiation as a Processing Aid in Beef Slaughter Establishments." Dr. Engelson started his talk explaining the food irradiation which is the process of exposing food to high levels of radiant energy to destroy pathogenic microorganisms, parasites or insects that might be present in the food. The general requirements of the irradiation in the market are radiation dosimetry, and labeling. Irradiation used to treat food as food additive in meat, poultry, and fresh produced against pathogens such as *E. coli* O157:H7, *L. monocytogenes*, *Salmonella* spp. and *Campylobacter* spp. He emphasized a need to gain the support from new administration on accepting the merit of the irradiation.

Dr. Elliot T. Ryser presented about X-ray irradiation technology for the food industry. Brief history of X-ray technology and inactivation mechanism of microbes were elaborated. Different dose levels of X-ray irradiation and their corresponding functions and irradiation dose measurement methods were underlined. Furthermore his presentation included list of FDA approved food products that can be decontaminated using irradiation. Results from recent research works on X-ray decontamination of ground beef, lettuce, asparagus and almonds were presented. The US labelling requirement for irradiated food products and benefits of X-ray irradiation technology were also presented.

Mike Burness from Chiquita Brand Internationals Fresh Express gave a talk on "Industry Adaptation of Irradiation in Produce Processing Establishments" He explained fresh cut industry at risk and the necessity of irradiation in food industry. Dr. Alejandro Castillo delivered a speech on directionality of E-beam and carcass irradiation and reducing pathogens in produce. Electron beam irradiation, accelerated electron beam at 99.9% speed of light has higher loss rate and low penetration rate than X-rays. Results from recent research works were showed that E-beam can be used to control *Salmonella* and *E. coli* O157:H7 in meat and produces. Since E-beam is highly directional, decontamination of uneven surfaces (e.g., whole carcass) using E-beam is difficult. To overcome this problem, Dr. Castillo introduced the design of tubular electron scatter chamber which can deliver electron beams in all direction.

There were many interesting questions arose from audients during panel discussion. Main problem in the irradiation they discussed is public appears to have little knowledge of the irradiation and some consumers worried about radiation hazards, hence not willing to buy irradiated foods. Question from the audience inquired about the possibility of combined application of irradiation and modified atmosphere packaging (MAP). Presenters responded that there has been no study conducted with MAP products. Another interesting question was what is the perceived risk associated with by products of food irradiation. Dr. Ryser told that neither studies to test by products nor studies to test sensory quality have been conducted. Dr. Castillo mentioned that effect of E-beams on residues of pesticide is in progress.

### S4 – Epidemiological Trends of Noroviruses

*Nigel Harper, Kansas State University*  
*Kirsten Hirneisen, University of Delaware*

This symposium on the epidemiological trends of noroviruses focused on the recent outbreaks of GII.4 noroviruses and highlighted the importance of genetic drift of norovirus transmission and increase in severity of the disease burden. Aron Hall of the CDC in Atlanta, GA opened this symposium by discussing the changing epidemiology of noroviruses with emphasis on the GII.4 strains and recent issues. GII.4 noroviruses have caused 5 different pandemics and it was noted that as a new strain emerges, it replaces a predecessor strain. Recent advances in RT-PCR use and murine norovirus (MNV) as a cultural surrogate for human noroviruses have helped with further understanding and research. Systems such as the National Outbreak Reporting System and CaliciNet allow for public health laboratories to compare sequences of noroviruses. Challenges to norovirus control include resistance to disinfectants, low infectious dose and a lack of cross immunity.

Captain George Vaughan from the CDC's Vessel Sanitation Program spoke on the current trends in cruise ship-related norovirus outbreaks through addressing the issues of control. Captain Vaughn discussed current control plans implemented including the Outbreak Prevention and Response plan which contains written duties of each depart-

ment when an outbreak occurs. Challenges to preventing norovirus outbreaks on cruise ships include the diversity of the ships in size which can range from 50 m in length with 49 passengers to 339 m in length with 3,600 passengers and also the large number of surfaces to be disinfected when an outbreak occurs.

Dr. Lee-Ann Jaykus of North Carolina State University reported on a study of an outbreak of norovirus from rafting trips on the Colorado River. One of the major concerns about these trips is that the toilets on the rafts are so close to the food and the contamination could be coming from that problem. The definition of "ill trips" was 3 or more rafters who experience vomiting or diarrhea. Of the rafting trips observed, 14% were considered "ill trips" and all were found from 5 different rafting companies. An investigation showed that the contamination did not come from the water or the guides. Further analysis clearly showed that an infected food handler who did not wear any gloves was the cause of the outbreak. The strain that was involved has been determined to be rare.

During the panel discussion, two main points were made very clear. There is little science that shows that typical hand sanitizers are effective against noroviruses. The second point was made by Captain George Vaughan about where norovirus is usually found after the boat is sanitized. He stated that the areas that are known as the 'hot spots' are sanitized so well that they are not of concern. The other areas are of more concern because of noroviruses ability to be carried so easily by infected humans.

### **S5 – Pathogen and Spoilage Persistence in the Processing Environment and Food Products: Where, Why and How Do We Know?**

Melissa Hughes, Texas Tech University  
Jie Wei, University of Delaware

The symposium opened with R. B. Tompkin (retired, ConAgra Foods), who introduced the topic of factors affecting microbial persistence in the food industry. Microorganisms such as *Salmonella* and *Listeria monocytogenes* become established and persist over time, and are responsible for food contamination in harborage sites. Weaknesses favoring this persistence included inadequate monitoring and assessment programs, hoping that the problem will go away by ignoring positive samples, lack of investigational skills, and not recognizing the significance of proper construction.

Kendra Nightingale (Colorado State University) focused on the molecular ecology of *Listeria monocytogenes* (LM). LM is capable of surviving in 40 species of animals and birds, and accounts for 30% of deaths due to foodborne pathogens annually. The *inlA* and *inlB* genes are key in the spread of this genetically diverse organism, and strains that persist in ready-to-eat processing plants are associated with virulence-attenuating mutations in *inlA*. Environmental sampling and molecular subtyping are necessary in controlling LM and verifying its removal.

Thomas Hill (FDA) discussed the persistence of *Salmonella* Newport on tomato farms in Virginia. *S. Newport* lives in the ponds, and the development of a natural antagonist for this strain in tomatoes is needed. Possible contamination sources on the farm include soil, water source and quality,

farm workers, and animals. Growers need to become more conscience of the environment and follow GMPs in order to increase sanitary handling of fresh produce.

After the break, Robert Tauxe (CDC) talked about the role of pathogen persistence in foodborne disease and outbreaks from the view of epidemiological approach. Recently, events of outbreaks have been connected with the same subtype of pathogen or the same source, revealing the impact of localized persistence of a pathogen. The mechanism of the persistence in absence of the host was still not very clear, but it had been found that *Salmonella* could survive 180 days in soils at 20°C. Repeated outbreaks could happen years later, and control strategies are crucial.

The following presentation was on microbial spoilage from an industry perspective, by Susan Freund (Kraft Foods). She pointed out that spoilage was challenging in today's environment, as consumers demand 'fresher' foods with less preservatives. The most common spoilage organisms are acid-resistant yeast, heat-resistant mold and lactic acid bacteria. These particular organisms are difficult to monitor, produce low microbial counts, and start the "screening" process after slight changes in product formulation. In order to control and avoid product spoilage, raw material testing and change management is critical.

The last presenter was Don Zink (CFSAN, FDA), and his talk was on the regulatory implications of persistence in the processing environment and the final product. He gave a lot of examples of governing laws as the basis for many FDA acts. For adulteration, the US Food Drug and Cosmetic Act Section 402(a)(1) focuses on when the product is directly contaminated with pathogens, and Section 402(a)(4) was for contaminated food production facilities but not the food itself. Chapter 21 of the US Code of Federal Regulations (Part 110) was also discussed.

### **S6 – Zapped! Optimizing the Consumer Experience of Microwave Cooking through Labeling, Infrared Thermography, and Validation**

Silvia Dominguez, Rutgers University  
Sarah Markland, University of Delaware

The symposium started with a presentation by Julie Zimmerman from Target, where she described the initiatives taken by this corporation in order to address the challenges posed by microwave cooking of not-ready-to-eat food products. The Microwave Food Safety working group was created, and among their accomplishments so far is the establishment of a standard wattage symbol for all microwave ovens sold by Target, as well as the use of this symbol in the development of microwave cooking instructions for Target-owned brand foods. A validation protocol for these cooking instructions has also been developed, considering factors such as product and oven variability, consumer knowledge of oven wattage, testing protocol, etc.

The following speaker, Greg Hooper from Campden BRI, discussed the applications of thermal imaging for microwave heating. Temperature-measurement systems, like thermocouples and fiberoptic thermometry were introduced, as well as thermal imaging. Thermocouples and fiberoptic

probes require the identification of "cold" and "hot" spots in order to obtain relevant results. Cold spots are important because their connection with pathogen destruction and safe heating processes. Hot spots are important from a packaging integrity and consumer safety point of view. Thermal imaging can provide useful information for identification of cold and hot spots in a food product, although only related to surface temperature. Thermal imaging can also help identify heating patterns inside the oven, defrosting uniformity, packaging performance, cooking instructions development, among others.

Steve Vlock, from ConAgra foods, then went on to present the idea of creating a microwave validation lab. A microwave validation lab would provide the ability to test microwave oven performance factors such as size, wattage, voltage, oven brand and others. Microwave ovens would be stacked on individual shelves as opposed to on top of one another to avoid interference. Only one microwave oven per electrical outlet should be an efficient setup when testing voltage and wattage patterns. A lab with a large number of ovens would be more efficient as fewer experimental repetitions would need to be made. Microwaves should be grouped according to wattage and as many different microwave brands as possible should be tested. Mr. Vlock recommended that thin probe instant read thermometers be used to probe cold spots. A fiber optic system could be used with several advantages; however Mr. Vlock also mentions several disadvantages including cost. Data collection should include trial number, oven used, cavity size, brand, labeled versus actual wattage, time of treatment, and special or extra steps taken.

Robert Garfield, senior VP of the American Frozen Food Institute, concluded the symposia with a discussion on the frozen food industry's response to microwave oven safety. He explained the main challenge of the industry: maintaining confidence in the consumer. He proposed many ideas that could be used on food packages to help aid the consumer in cooking a safer product. Microwave food packages should be labeled with the final temperature that should be reached when cooking. Packages could also provide the consumer with visual cues that may help in determining if a product is fully cooked. Supportive statements such as "Do not allow product to thaw" should also be added. In the kitchen, refrigeration magnets could demonstrate and remind the consumer of proper use of a microwave oven. In grocery stores, templates could be displayed for consumers to review while shopping and before purchasing a product. For more information on microwave oven safety please visit [microwaveovenfacts.com](http://microwaveovenfacts.com).

### **S7 – *Listeria monocytogenes* Controls from Local to Global—Are They Working?**

Amrita Pathania, Auburn University  
Arpan Bhagat, Purdue University

Lisbeth Goddick started off the session with *Listeria* prevention practices in small farmstead operations. Artisan cheese manufacturing is increasing with the demand for it. However there are holes in food safety of farmstead

cheeses unlike commercial cheeses. Consequently 4–8% of the cheeses are contaminated with *Listeria monocytogenes*. This is mainly because farmstead cheese has close connection between animals and cheese making in terms of air and water quality. Thus regulators, consultants, academia and suppliers need to work closely. Layout of the plant needs to be taken into consideration along with construction (in accordance with PMO and GMPs), equipment and sanitation program because retrofitting is expensive. Also training should be provided to the personnel regarding GMPs, SSOPs and microbial hazards such as raw milk quality. A hurdle approach should be used for cheese such as pH and rate of acid development, salt,  $a_w$ , temperature, live cultures and ripening time and temperature. The draft guidance of Feb. 7, 2008 by FDA discussing the formulation of foods, storage practices, and controls for personnel and facility is available to the public as docket FDA 2008D0096.

Dr. Jeffery Farber provided an update on new *Listeria* initiatives in Canada. In 2008 Canada saw its first meat-borne *Listeria* outbreak that spread to 7 provinces. According to CFIA meat and poultry directive, production facilities must implement food contact surface testing for *Listeria monocytogenes*. In addition there are requirements for increasing the frequency of end product and environmental testing (4 per month per line) and trend analysis. The required environmental sampling plan recommends the testing of non contact food surfaces in addition to food contact surfaces. The definition of risk alternatives is similar to FDA's alternative 1. Risk based sampling and verification has been proposed to update operation and sampling guidelines for enhancing the ability to detect *Listeria monocytogenes*. Health Canada and CFIA plan to focus on dairy industry, fish and seafood followed by produce industry as the next steps to enhance control of *Listeria*.

Martin Cole spoke about the Codex *Listeria* standards for RTE foods. The probability of detecting a microbial or other hazard in a food lot cannot ensure its absence. Two class attribute sampling plans have been to accept/reject a sample lot based on producer's risk vs. consumer's risk. The risk analysis by Codex helps to better link food safety activities by relating criteria to risk management metrics. Codex Alimentarius meets every 2 years and uses an eight step procedure to elaborate a code for new work using a consensus process to advance the code. The Codex *Listeria* standard for RTE foods was proposed in 1998 and accepted in 2009. Vast majority of cases of listeriosis have been associated with consumption of foods that don't meet the current standards (25 g or 100 CFU/g). No growth of *Listeria* would occur in product having a pH < 4.4 and  $a_w$  < 0.92. Compliance to standards is the biggest public health driver. GHP and HACCP are more important than testing. Codex *Listeria* standards are based on whether product supports the growth of *Listeria* and is science/risk-based.

### **S8 – Effect of Climate Change on Food Availability and Safety**

Rachel McEagen, University of Florida  
Anderson D'Souza, University of São Paulo

This session began with M. Christina Tirado, presenting for Renata Clark, presenting an overview of the effects of climate change and impacts on agricultural production and food safety. Climate change can affect food safety in several

ways such as affecting the incidence and how the food contamination occurs (routes) and also, by affecting the survivability and growth of pathogens in raw materials or processed foods. Data on daily temperature during a year compared to the incidence of foodborne disease outbreaks was used to support the rationale that the higher environmental temperature, the higher the incidence of specific pathogens such as *Salmonella*. This is in contrast to what would be seen with psychrotrophic bacteria. It is expected that extreme events lead to changes in stress responses of microbial pathogens by a forced strategy to surviving these conditions in the environment. The emergence of foodborne pathogens or the spread of them to regions where their incidence has not yet been reported are of concern. It was stated that there is much uncertainty on the effects of climate changes on food safety, but control measures applied now can be valuable to try to control the bacterial pathogens even under a changing climate environment.

The second speaker, Angelo DePaola, presented and discussed possible effects of climate changes on bacterial pathogens. His presentation was mainly focused on the effects of increased seawater temperature on the seasonal occurrence of pathogenic *Vibrio* sp. and the incidence of disease caused by these bacteria on humans. During the presentation, DePaola has shown videos where the attendees could see regions from Pacific Coast of USA and Canada, where an increased seawater temperature was linked to an increased in the incidence of disease caused by pathogenic *Vibrio*. Effects of extreme events may also culminate with changes in bacterial virulence and responses to stress conditions, but little evidence on that is available now.

Next, Stephanie Moore discussed the worldwide expected increase in harmful algal blooms due to the rapid increase in global temperatures. It is expected that blooms will occur earlier in the season and last longer, as there will be more days per year that are able to support the growth of harmful algal blooms. Moore also suggested that harmful algal blooms will also occur in expanding geographic regions as more areas become suitable for growth. While evidence suggests the increase in algal blooms is mostly due to the temperature increase, evidence also exists suggesting a link to ballast water.

To end the session, Mark Moorman discussed the climate change affects on mycotoxin occurrence in cereal crops. Stressed crops have decreased barriers to fungal invasion; stress can result from extreme temperatures, excess humidity or precipitation, and inadequate soil conditions. Mycotoxins are typically produced when fungi are exposed to sub-optimal conditions. Moorman discussed the difficulties experienced when an area of cereal crops is affected by fungi, and the increased costs in food processing which can result.

### **S9 – Tracking and Tracing Technologies — Do You Know Where Your Steak and Tomatoes Come From?**

*Alison Brown, Texas Tech University  
Ravi Jadeja, Louisiana State University*

Gale Prince emphasized the importance of tractability in his talk titled 'Learning from Traceability Technologies' and discussed how it can help to improve food safety and minimize economical loss in case of a recall. He also talked

about tractability record requirements and current problems with tractability, such as the lack of awareness and lack of proper records due to the complexity of record requirements. He also pointed out that in recent years consumer awareness has increased due to high profile recalls. A common platform to transfer information would be useful, but some issues like cost and its complex nature make it difficult for small companies to implement and use.

Steve Arens from the GTIN industry gave a brief introduction of GSI. GSI standards are industry developed and accepted voluntary standards for various purposes like company identification, product identification, electronic messaging, barcodes, and RFID. He discussed two key GSI standards that refer to the Global Trade Item Number (GTIN) which can be 8, 12, 13 or 14 digits in length. These numbers uniquely identify any one product offered in commercial trade. The second standard is the Global Location Number (GLN) which is a 13 digit number used to uniquely identify a physical location. The uses of UPC codes and GSI-128 standards were also covered. GSI standards can provide the building blocks for business processes in a standardized format that is understood by the entire supply chain and can improve product tractability.

Ewen C. Todd of Michigan State University discussed the examples of electronic tagging and the successes and failures that accompany them. Enhanced traceability by electronic tagging will allow recalls to distinguish between contaminated and non-contaminated products and will ultimately decrease the amount recalled. Tagging cattle would allow animals to be traced from their source through all of their subsequent moves and locations. However, cost and responsibility for the cost has already caused the program to fail in Nebraska. Electronic tagging has proved more successful in the dairy industry where individual cheese packages can be traced to the wheel and the original milk source it was produced from.

Mike Cassidy of the OMAFRA Food Safety Science Unit pointed out that the United States and Canada import large amounts of produce which is currently unable to be tracked and traced quickly and effectively due to use of different standards. It was recommended that the produce industry adopt GSI standards that are already used in every retail location for traceability. This would create a produce supply chain traceability with common standards and consistency. Product could be traced back to the farm immediately, contaminated product would be removed and similar product that is not implicated would be unaffected. Implementation would ensure quick tracing, reduce illnesses, save money, and minimize time and market disruption. It was predicted that produce consumption would increase due to the decrease in illness risk associated with eating fresh produce.

### **S10 – International Food Protection Issues**

*Diego Paiva, Auburn University  
Di Li, Rutgers University*

The International Food Protection Issues: Overview and Global Commodity Trade Symposium consisted of six talks under the perspective of different segments such as the food industry and academia. The first talk was given by Dr. Robert Brackett from Grocery Manufacturers Associa-

tion. Dr. Brackett on his talk set the pace for the other speakers introducing the subject of the symposium. He discussed over how the trade format has been changed and evolved under all levels including consumption, production, trade, food ingredients, food processing, nutrition value, and communication between buyer and supplier respectively. The second talk was given by Dr. Frank Yiannas from Walmart who presented his perspective on global harmonization of food safety standards for the future of a safer global food supply. Dr. Yiannas gave emphasis on how adopting harmonized standards benefits the food industry as a whole including consumers, suppliers and retailers. Dr. Larry Keener from the International Product Safety Consultants Inc. was the third speaker, and he talked about risk based vendor assurance. He talked about risk uncertainty variability, the interactions between risk assessment, risk communication and risk characterization. According to Dr. Keener, risk assessment in the food industry should be seen as an attempt to reduce cost of production. Following that, he discussed about how vendor assurance is a critical process for preserving brand equity and business objectives. Dr. Keener concluded his talk establishing relationships between the factors which may affect risk assessment and supply chain assessment including product, performance, and reliability. The fourth talk was given by Maluwa Behringer, Kraft Food's Associate Director for Procurement Quality. Her talk was about particular specification requirements in food production systems and within this subject she discussed about the aspects of managing quality and food safety across a global supply chain. She also made a comprehensive approach on supplier quality management and how it is critical to support global sourcing. Dr. Behringer gave great emphasis on how essential it is to have sound knowledge of who, where and what you are sourcing. Being able to answer these questions about suppliers is critical and multiple approaches can and should be used to monitor suppliers and materials. John Ferreiro followed Dr. Behringer's talk, and he discussed about the importance of food safety to food brokers since globalization of the food business, outsourcing and reduction of staff has a huge impact on guaranteeing the safety of the final product. The last speaker was Dr. Robert Buchanan from the University of Maryland and he talked about the harmonization of regulatory requirements. Dr. Buchanan approach was on how establishing and verifying commodities' standards are a great challenge. According to him, harmonization of these requirements and standards will have a great impact on the food system chain and as a consequence on international trade as well. He concluded his talk stating the importance of daily decisions made by the food industry and regulatory agencies concerning food safety and the impact these decisions have to the food industry.

**S11 – Foodborne Disease Outbreak Update:  
Campylobacter in Fresh Peas; Salmonella Schwarzengrund in Pet Food; Salmonella Saintpaul**

*Sarah Dierschke, University of Wisconsin  
Govindaraj Dev Kumar, Virginia Tech*

**Salmonella Schwarzengrund and Pet Food**

Casey Barton Behravesh (CDC) and Daniel McChesney (FDA) *Salmonella Schwarzengrund* was responsible for the contamination of dried dog food. The outbreak occurred in multiple states and a rare PFGE pattern was observed. A case-controlled study helped determine contaminated dog

food as the infection source. Investigation of a particular facility in Pennsylvania revealed the flavoring area as a possible contamination source. The plant was shut down for clean up. A second wave of outbreaks led to the permanent closure of the facility.

Information about the plant producing contaminated pet food was obtained from the lot code. Inspection by FDA did not reveal problems or irregularities but an inspection by the PDOH (Pennsylvania Department of Health) revealed environmental samples positive for *Salmonella* species. On August 13 FDA found two positive samples following which a voluntary recall occurred. The PDOH notified the FDA of new cases of salmonellosis associated with dog food. *Salmonella Schwarzengrund* was isolated during plant inspection by FDA following which the plant was permanently closed in September. All pet food was voluntarily recalled.

**Campylobacter and Fresh Peas**

*Tracie Gardner (Alaska Dept. of Health and Social Services)  
and Collette Fitzgerald (CDC)*

In the month of August, 2008 a number of cases of *Campylobacter* infections were reported in Alaska. Through case controlled studies it was determined that raw peas were the source of campylobacteriosis. A more detailed inspection revealed that packaged peas responsible for infections were being sold in a farmers market. The peas were from a certain farm in Anchorage, Alaska. Investigation of the farm revealed that the source of the pathogen could have been from cranes that defecated on the field. Lack of compliance with good agricultural practices during the post harvest period could have promoted the spread of the pathogen to more peas.

*Campylobacter* has a short incubation time, and typically the contaminated food source is thrown out before investigations. Fifty-two sample isolates from August–September 26, 2008 were submitted to the Alaska State Public Health Department. From the 52 isolates, 25 different PFGE patterns were identified. Using multilocus sequence typing, 4 isolates were linked from environmental isolates (2 crane isolates, 2 pea isolates) to human isolates.

**Salmonella Saintpaul and Tomatoes/Peppers**

*Ian Williams (CDC) and Sherri McGarry (FDA)*

In May 2008, a rare serotype of *Salmonella* was reported to PulseNet, a surveillance tool that detects ¾ of foodborne outbreaks, and other matches were found. Preliminary surveys showed 86% of ill persons to have consumed tomatoes; a case-control study followed (88% of cases consumed tomatoes compared to 64% of controls). In June, PulseNet began to detect clusters of *Salmonella Saintpaul* cases associated with Mexican style restaurants. Following 2 more case-control studies, jalapeño and Serrano peppers were added as possible contaminated sources; no one food item was identified as the culprit. Therefore, contamination probably occurred at a farm or repacking facility that dealt with all 3 suspected sources.

In working with CDC, FDA conducted approximately 450 investigations to trace back the source of contamination. While outbreak detection by PulseNet detects small clusters faster, it is difficult to implicate a vehicle. Rapid tracing from point of service to source (including ingredients) with lot codes is essential to improve CDC's and FDA's response efforts.

### **S12 – Attribution of Foodborne Illness/Disease**

*Lenese Grant, Auburn University  
Angela Laury, Texas Tech University*

Dr. Frederick Angulo, CDC, began his talk by explaining that an estimation of the burden of food borne diseases is needed for attribution and economic assessments. Attribution is defined as the "the partitioning of the human health burden to specific sources", which allows for prioritization of interventions and advocacy for resources. An updated estimate of foodborne illness, from the old estimate by Mead et al. 1999, includes more recent data, new methods, and new data sources, which include 31 pathogens (25 with surveillance). The next speaker, Sara Pires explained that attribution may occur at the point of reservoir, processing or exposure. She spoke of source attribution methods which include microbiological and epidemiology approaches as well as a Comparative Exposure Assessment. The microbiological and epidemiological approaches entail characterizing pathogens by phenotypic or genotypic methods, while the Comparative Exposure Assessment method focuses on transmission routes, such as environmental, foodborne or through animal contact. A case study was conducted using the epidemiology approach on salmonellosis and the most important risk factors for *Salmonella* included undercooked chicken, raw eggs, and travel.

Tracy Ayers presented information on illnesses, hospitalizations and deaths due to food commodities. Outbreak investigations were conducted by estimating illness caused by each food. Commodities were broken up into simple foods (1 commodity) and complex food (multiple commodities) which influence the manner to which an outbreak is investigated.

Dr. Dana Cole, GA Division of Public Health explained how the Attribution of foodborne illness can be estimated using the Danish Model. The model is based on the expected number of human salmonellosis cases using the FSIS point of processing for specific commodities. The model,  $P_{y_i} M_{y_i} a_i q_i = \lambda_{y_i}$ , where "P" is the prevalence of serotype, "M" is the annual consumption rate, "a" is the food source-dependent factor, and "q" is the bacteria-dependent factors, utilizes several surveillance projects for seven commodities. They found that eggs and ground beef had the highest rankings for "a's" and serotypes Newport and Javiana were the highest ranked "q's".

Robert Brackett, Grocery Manufacturers Association, followed with the "Industry Perspective on Attribution of Foodborne Illness" with the take home message "Attribution is Important! Not only does it help provide science but helps focus resources and the food industry must be considered a partner in the process." Estimates of attribution in the past have focused on the characteristics of the microorganism, but today estimates are now focusing on the

vehicle of transmission of the microorganism when investigating an outbreak. Surveillance along with sampling and testing programs can be excellent tools through epidemiological and cultural links, but can also be a challenge due to complex foods implicated in outbreaks and non traditional ingredients identified in an outbreak.

During the panel discussion, most of the questions were about the Danish Models ability to adapt to complex foods, emerging pathogens, categorization by the CDC, sporadic outbreaks, and normalization concerns. Other questions focused on world issues of foodborne illness estimates.

### **S13 – Best Practices for Cleaning and Validation**

*Silvia Dominguez, Rutgers University  
Laura Strawn, University of Florida*

The symposium started with a presentation by Christopher Griffith from University of Wales focused on the importance of cleaning programs. The talk started with a differentiation between cleaning, the removal of soil, and disinfection, the destruction of microorganisms. Cleaning affects food safety and shelf life, and may be a legal requirement. A cleaning system and programs must be defined, validated, tested, monitored and verified. Poor cleaning, which may lead to cross-contamination, can be responsible for serious food borne outbreaks.

Dale Grinstead, from Johnson Diversey, focused his presentation on methods for cleaning food production environments. Soil constituents are the same as those in foods (carbohydrates, proteins, lipids, etc.), each of which poses different cleaning challenges. The focus of a cleaning system should be getting the process right, by validating it for example. It is important to assess cleanliness of the right places, those difficult to clean or reach, to assure a valid surface sampling. Time, mechanical action, chemical and temperature, the major factors influencing cleaning, were discussed.

Ken Davenport, from 3M, presented the applications and advantages of cleaning verification using ATP methods. As compared to visual and microbiological methods, ATP presents the advantage of being rapid, objective, sensitive and simple, and can detect product residues. To set up an ATP testing system, it is important to identify proper test points and set acceptable limits. The collected data is valuable to analyze trends and identify abnormal cleaning events.

The second half of the symposium focused on allergens. Mark A. Domanico, from Kellogg, began with an overview of allergen cleaning. The target level of clean for processing plants should be allergen clean. Companies can achieve an allergen level of clean through standard SOPs. Factors that affect SOPs include type/form of food, concentration of allergen, type of contact surface, rework of process streams, and performance standards. Allergen sanitation programs should be validated and inspected often to ensure success.

Joe Stout, from Kraft, presented a talk on dry cleaning methods for allergen control. There are seven steps of effective dry sanitation, including pre sanitation preparation, secure and dismantle equipment, dry clean (log out – tag out), detailed clean, post sanitation inspection and reassembly of equipment, pre-operational inspection, and final

inspection and documentation. Validation is crucial to sanitation. He concluded with stating, "there are no off days in cleaning, cleaning needs to be done each time perfectly, because someone is eating that product and you are dealing with people's lives".

Dr. Lauren Jackson, from the National Center for Food Safety and Technology, focused on surface allergen testing methods. Approximately 10–12 million people annually in the US suffer from food allergies. Cross contact in plants from poor sanitation is the most likely vector for allergens in food products. Various surface allergen testing methods can be utilized to validate plant sanitation programs, such as visual inspections, allergen specific ELISA testing, and non-specific method testing (i.e., ATP and total protein). Additional methods in development include LC-MS-MS, PCR, spectroscopic methods (i.e., fiber optics) and biosensors.

#### **S14 – Enhancing Oyster Safety through *Vibrio* Control Plans**

Reshani Nisansala Senevirathne, Louisiana State University  
Sonja T. Jones, Louisiana State University

Dr. Angelo DePaola (FDA Gulf Coast Seafood Laboratory) opened the symposium with a presentation on "How We Got Here with Regulations of *Vibrio vulnificus* and *Vibrio parahaemolyticus* and Risk Calculator." Dr. DePaola described the development of Interstate Shellfish Sanitation Conference (ISSC) and involvement of FDA on post harvest controls of shellfish. Both *Vibrio vulnificus* and *Vibrio parahaemolyticus* upregulate with the water temperature and it can be overcome by rapid cooling. *Vibrio vulnificus* and *Vibrio parahaemolyticus* Risk Calculators (example: mean water/air temperatures), and states implemented plans.

Matt Biggerstaff (Enteric Disease Epidemiology Research) presented "Oyster-associated *Vibrio* Infections in the United States, 1999–2008," where he described the morphology of *Vibrio* species. Followed by, the discussion of exposure associated with infection which the method of analysis was COVIS database. COVIS is the Cholera and Other *Vibrio* Illness Surveillance System that analyzed cases of oyster-associated cause of illnesses. The results showed 4,958 infection of *Vibrio* (3,340 foodborne and 1,618 non-foodborne). As a result, over 90% of illness was caused by consumption of raw oysters. *Vibrio vulnificus* had the greatest number of fatalities (48%); whereas *Vibrio parahaemolyticus* had less than 1%. The results of the study showed no decline in the past 10 years in the overall number of *Vibrio* illnesses and there is a need for continued surveillance and additional funding.

Maryanne Guichard (Division of Environmental Health, Dept. of Health) spoke about the "*Vibrio parahaemolyticus* Control in Washington State." She mentioned that public health of Washington State is always working for a safer and healthier Washington. Due to relatively lower water temperature only *Vibrio parahaemolyticus* became a problematic species in Washington during summer months. Since 1975 there has been reported illnesses regarding *Vibrio parahaemolyticus* and recently in 2006 a major outbreak was reported. She mentioned that this control plan, established

harvest, temperature control, and transportation requirements for oysters intended for raw consumption during the months of May through September. Further she emphasized more enforcement and the improvement needed regarding educating industry and general public about *Vibrio parahaemolyticus* to overcome this matter.

Lastly, Bill Dewey (Taylor Shellfish Company) discussed the "Shellfish Industry Perspective on ISSC *Vibrio* Control Plans." He explained working with the Interstate Shellfish Sanitation Conference (ISSC) and different control strategies for different *Vibrio* spp. and geographical regions. *V. parahaemolyticus* is more prevalent in US West Coast and *V. vulnificus* is more prevalent in Gulf of Mexico. There has been a substantial effort to educate at-risk consumers, but have not been able to achieve that goal. Description of the harvest/handling/processing of oyster on the West Coast and Gulf of Mexico was outlined. Mr. Dewey regards the *Vibrio* controls plans have been effective at reducing illness rate. Additionally, illness monitoring and adaptive management is working as well.

#### **S15 – Less Recognized and Underappreciated Foodborne Pathogens – No Crystal Ball for the Next Big Bug**

Alison Brown, Texas Tech University  
Olasunmbo Ajayi, Alabama A & M University

Dr. Robert Tauxe of the CDC categorized foodborne pathogens as organisms that must be present in food, cause illness after food consumption and has the capability of causing illness in humans. Besides the commonly known foodborne pathogens such as *Listeria* and *Salmonella*, he talked about re-emerging pathogens (*Bacillus anthracis*, *Vibrio cholera*) and prominent pathogens that have been implicated in outbreaks around the world. *Angiostrongylus cantonensis*, rat lungworm, also found in larval form in snails, *Trypanosoma cruzi*, a blood vector also transmitted via sugar cane juice and superbug ST398 MRSA from pigs are some that were covered. He also discussed emerging infections that have been traced to new food animal contacts in developing industries. He believes that a new pathogen emerges about every 16 months and is subsequently identified through a systematic investigation of the resulting outbreak.

Dr. Eric Johnson of the University of Wisconsin-Madison presented on Gram-positive spore formers, particularly *Clostridium*, which is ubiquitous in the environment, but difficult to culture. He emphasized the emergence of a hyper-virulent strain of *C. botulinum*, the persistence of *C. difficile* when antibiotics usage diminishes the normal gut flora, and proposed that *Clostridium* is a cause of autism. He concluded that gut flora maybe involved in some disease development and stressed that "health begins in the colon".

Dr. P. C. Vasavada of the University of Wisconsin-River Falls divided microorganisms into three groups: beneficial, pathogenic and spoilage bacteria. Though some organisms like *S. aureus* and *Salmonella* are considered to be established foodborne pathogens, *Vibrio*, *E. coli* and *Enterobacter sakazaki* are some of the new emerging pathogens currently being studied. He discussed the rapid progress being made in the detection and characterization methods and approached to studying these microorganisms.



Dr. Mark Sobsey of the University of North Carolina-Chapel Hill focused on communicable diseases after environmental disasters. Infections are associated with crowding, poor sanitation and nutrition. Wound infections with atypical pathogens are common after disasters due to the abnormal mixture of soil, dust, and water in the environment. Increased incidences of animal bites also add to the unusual infections. He talked about pathogens such as *C. tetani* (soil), *Aeromonas* (brackish water), *Aspergillus versicolor* (flood); and how different disasters provide risks for emergence of different pathogens. Timely treatment and control were stressed to prevent disease.

Dr. Collins of the University of Wisconsin-Madison discussed how ruminants are the primary host for *Mycobacterium avium* subsp. *paratuberculosis* with an incubation period of about 5 years. In the United States in 2007, nearly 68.1% of cows were infected. It is present in infected cows' milk and higher pasteurization temperatures are required to kill the bacteria. It is believed to be associated with Crohns disease in humans, but has not been defined as causal.

Dr. Suresh Pillai of Texas A&M University-College Station emphasized the use of emerging technologies such as deep sequencing and pyrosequencing to identify microbial diversity in different foods. He will continue with this research to study the long term influences of foods and their microbes on health.

### **S16 – Facing a Persistent Challenge: *Salmonella* Control in Low-moisture Foods**

Laura Strawn, University of Florida  
Arpan Bhagat, Purdue University

The symposium started with a presentation by Dr. Patricia Griffin, from CDC's Foodborne and Diarrheal Branch who focused on the background of *Salmonella* and recent US outbreaks of salmonellosis in low moisture foods. There have been 11 outbreaks associated with the consumption of low moisture foods between 1998 and 2009. Low moisture foods can include pet food, cereals and associated nut products. Specifically three outbreak investigations were discussed in depth, which were associated with consumption of a puffed rice snack, peanut butter and white pepper. Dr. Griffin noted that the number of *Salmonella* outbreaks have increased due to better detection.

Jenny Scott, from Grocery Manufacturers Association, presented low moisture products and the worldwide problem in human and pet foods. *Salmonella* can't grow in most low moisture foods, but can survive for long periods of time. This is problematic because many low moisture foods have long shelf lives. Most outbreaks of salmonellosis in low moisture foods affect large numbers of consumers and span over long periods of time. Overall, the risks of *Salmonella* in low moisture foods should be investigated further, as well as potential solutions for getting rid of *Salmonella* in low moisture foods.

Theodora Morille-Hinds, from Kraft Foods, discussed the industry approaches to minimizing *Salmonella* ingress and spread within low moisture product manufacturing facilities. Industry approaches include being aware of

the many sources of potential *Salmonella* contamination, establishing supplier approval program key elements, raw materials testing programs, and in depth facility validations. Examples were provided for each approach. Highlighted was employee training and how critical it is to the success of these industry approaches.

Following the break Timothy Frier, GMA talked about the importance of controlled wet cleaning while using a 4-step cleaning program. Avoidance of accidental and intentional introduction of moisture into dry processing areas and maintenance of hygienic design in the facility are critical. Accessibility for routine cleaning and sanitation, and integrity of infrastructure are important to prevent ingress, survival and multiplication of microbes. Thus it is important to involve marketing, operation, allergen control and sanitation personnel during the plant design. Eliminating and identifying dead ends and dead spots and sanitary design are essential. Validated cleaning and sanitation, separation of RTE from raw areas along with personnel hygiene and sanitation are required to prevent the ingress of *Salmonella*.

The significance of practical verification, environmental monitoring and product testing were discussed by Scott Hood. Pathogen control should be verified across the food supply chain. Prerequisite programs, HACCP, hygienic zoning and microbial surveillance are required to accomplish this goal. Trend analysis should be performed along with raw material, environmental and product monitoring. Zoning in the production area is very important. According to ICMSF the following zoning should be done: zone 1: product contact surface; zone 2: non-product contact surface (in close proximity with product contact surface); zone 3: non-product contact surface (distant from food contact surface) and zone 4: areas outside processing area. Finally in the panel discussion, the importance of preventing wet areas and the significance of complying with the guidelines was reiterated to produce safe foods.

### **S17 – Food Safety Challenge Impacting Global Food Trade**

Jeremy M. Adler, Colorado State University  
Anderson De Souza Sant'ana, University of São Paulo

This session was intended to discuss the question of food safety within the context of globalization. Specifically, how the differing countries; local or federal government agencies; or health offices handle global food safety issues. The section was composed by five presentations, including speakers from industry, universities, and regulatory bodies. Emilio Esteban, from the United States Department of Agriculture, commented on the role the Codex Alimentarius plays in managing the safety of food in global trade. Codex is designed to protect the health of consumers, ensure fair trade, and level the playing field for exporting countries through developing single reference point microbial criterion based on scientifically sound and transparent standards.

Bobby Krishna, from the Dubai Municipality, commented on how the Emirate of Dubai manages its safety of food imports. Dubai imports food stuff from over 160 countries and has created a food classification, description, and

inspection system for food safety. All Items (over 100,000 registered since 2005) are tracked and verified as they enter the country based on a country of origin bar code. This is quite extensive work; therefore Dubai hires a very large workforce to accomplish the task.

Alejandro Castillo, from Texas A&M University, presented a talk on progress made since the 2008 *Salmonella* outbreak in green peppers. He reviewed the subjects regarding the outbreak and presented steps and work that are being performed by Mexican government to improve the safety of fresh produce that have an important economic role to that country. Measures applied by the Mexican government are not only concerned with an extensive microbiological testing of samples, but also with the training and implementation of GMP and HACCP approaches to assure the safety of produce exported, for example to the United States. The presentation showed clearly the large costs involved to rebuild the confidence of an importer after a massive outbreak linked with fresh produce.

Suely Nakashima, from Sadia, a large Brazilian meat product exporter presented a talk showing on how the industry works to comply with different requirements for products being exported to different countries worldwide. She presented specific examples on how Sadia's quality management system is designed to comply with claims linked to labeling of products, biological and chemical hazards established by importers. It was shown that sometimes a quick and massive investment in equipment, personal and training to be able to export foods to several countries is required. Suely showed how Sadia is able to quickly respond, and satisfactorily comply, when there is scientific evidence proving the feasibility of requirements with the technical inquiries raised by importers so as to assure that nutritive and safe foods are commercialized.

Caroline Smith-DeWaal from the Center for Science in the Public Interest in Washington, D.C., presented a review of contemporary food safety problems and cultural perspective across three world regions. Specifically, she gave examples and recommended combining information streams to develop baselines in illness prevalence. Once baselines are established, items of public health could be determined and prioritized.

### **S18 – Looking for Thresholds: A Multi-disciplinary Key Events Approach**

*Reshani Nisansala Senevirathne, Louisiana State University  
R.D.C. Senaka Ranadheera, University of Newcastle, Australia*

Dr. Robert L. Buchanan from University of Maryland opened the session with a presentation on "Introduction to the Key Events Dose-response Framework (KEDRF)." The dose-response modeling is one of the important tools used by both industry and government for the assessment and management of health risks posed by foodborne pathogens. In his talk he covered emergence of World Trade Organization (WTO) as the formal governing body of international standards, risk management principles, *foster innovation*, and reduce budget regulatory. Furthermore, he explained about

threshold level depends on the nature of the hazard such as chemical allergen or pathogenic microorganisms, examination the critical steps and treatments.

Dr. Mary Alice Smith from University of Georgia gave a presentation under the topic of "Introduction to the Key Events Dose-response Framework," which is a novel approach for evaluating low-level exposure and their potential health risk adopted by ILSI Global Threshold Project. Thresholds are the minimum dosage required to produce a biological response which can occur at every level of biological organization. She explained Key Events Framework (a framework in which to organize information about the multiple steps leading to an adverse outcome) in detail and outline of key event processes. She focused on chemical allergens and cancer/tumor development and spoke about mechanisms of carcinogenesis. She further explained key events for tumor development DNA-reactive MoA.

Third presenter for this session Dr. Richard C. Whiting from Exponent also talked on "Introduction to the Key Events Dose-response Framework (KEDRF) to Pathogenic Microorganisms." He explained about Toxigenic (*C. botulinum*), Toxicoinfections (*E. coli*) and Invasive bacteria (*Salmonella* spp.). He explained response modeling epidemiological approach, conditional chain of events, and identifying key events. Consequently, there is a need to understand and answer each question for each event; thereby understanding the pathways or processes can be identified. That leads to identifying the individual case or current population of the bacteria.

Dr. Steven Gendel from CFSAN, FDA, Summit Agro, IL presented information on potential application of the Key Events Dose-response Framework to foodborne allergens. He defined a food allergy as an immunologic reaction to a food usually mediated by IgE. Gastrointestinal, respiratory, cutaneous and systematic symptoms may be occurred after ingestion of foods due to these reactions. The immunology of an allergic response is a two step process: Sensitization which is poorly understood so far and elicitation which more data on thresholds is available. He explained major steps of elicitation in detail with critical factors affect on each and every steps. Those include ingestion, digestion, uptake and distribution, cellular events and effector interactions with tissue signs and symptoms. Dr. Gendel concluded his presentation with the explanation of future directions of key event approach to food allergy.

### **S19 – Round Up Your Pathogen Plan: Enrichment, Sample Preparation and the Legal and Social Perspectives**

*Ch.V. R. Kumar Tammineedi, University of Georgia  
Vanija Kallur, Alabama A&M University*

The symposium discussed about the current and new technologies of enrichment and sample preparation. The initial presentations are focused on enrichment and sample preparation. The concluding presentations discussed about the legal and social historical case studies related to a pathogen plan. Speakers included Jingkun Li (Siemens),

Mark Carter (Silliker), Byron Brehm-Stecher (Iowa State University), Charles Young (Johns Hopkins University), Craig K. Harris (Michigan State University), and Matilda Freund (Kraft Foods). The important factors to consider while developing a good rapid detection method are Detection goal for Pathogens and Limit of Detection of Assay (Rule of Thumb). In reality enrichment of the sample before detection is required in any rapid detection method which makes the enrichment a very important step in the detection of pathogens. New developments in enrichment to save time are by using modified conventional media, immunomagnetic separation, bacteriophages, etc.

One of the new trends in industry practice is to use compositing and reduced media volume. Compositing is combining multiple samples to form a larger analytical unit. This is performed before the media is added for incubation. This method is intended to reduce the number of tests run, decrease the cost, etc. Many studies show that compositing proves to be a promising method in saving time and cost.

Extraction, concentration and purification acts as middle man to enrichment and detection. Presence of Food matrix makes the detection of pathogens difficult in many rapid detection methods. Food particles cannot be removed easily. The challenges to be considered while extracting sample from food for the detection of pathogens are particulate matter, inhibitory substances, fat, background flora, viscosity, opacity/coloration, heterogeneous distribution of target cells, biofilms, etc. we need to extract, concentrate and purify cells from these food matrices. Some of the new developments in this area are using Nanotechnology, alternative binders, etc.

Ultimate goal of early diagnosis is to save lives. Both military and civilian entities have moved laboratory based assays for infectious disease such that they take test to sample instead of the sample to the test. Increased capabilities of biosenses include being faster, smaller, easy to use, inexpensive, highly sensitivity and specificity. Critical challenges include recognition of new gold standard other than culture, sensor integration, data fusion capability, massive parallel processing capacity, sample preparation. Sample preparation should be automated. There are assays being developed for food protection, whereas assays for major biothreat agents already exist. All these assays are undergoing clinical validations. Confidence in a result can be increased by using multiple orthogonal detection modalities. There is need to integrate sample preparation as component of detection and should coprocess both protein and nucleic acid. Now a days there is move towards parallel processing and a move away from singleplex/multiplex assays. The parallel processing allows simultaneous detection of less than one organism in a sample. Generic purification includes purification without regard to cell nucleic acid, protein, bacteria and virus. There is no need to identify target in advance. Ability to provide information of pathogen has increased without increase in cost. The public is losing confidence in food supply. Some aspects are in control such as holding the finished food product until results are obtained, validating methods to ensure accurate results, limit lot size and use of spilt lots

for dry processes. It is important to create a culture of continuous improvement.

## **S20 – Environmental Reservoirs of Major and Emerging Foodborne Pathogens**

Danielle Perkin, Kansas State University  
Aikansh Singh, University of Nebraska – Lincoln

The first speaker, Wondwossen A. Gebreyes, gave a talk about Reservoirs of Methicillin-resistant *Staphylococcus aureus* (MRSA) and other staphylococci. He started the presentation with some general information on *S. aureus* and Methicillin which is to be used against some penicillin-resistant strains. He also concluded that human and animals can be the carriers of MRSA. Animals included dogs, cats, horses, cattle, pigs, rabbit, etc. and the first case was reported in 1972. Most common MRSA strain is found in pigs all over the world. There were three major studies in this field which involved determining prevalence of *Staphylococcus* MRSA and MR-CONS in milk. Total of 552 samples were studied from 138 cows followed by DNA fingerprinting of the samples. Samples which came out positive for *S. aureus* were 49, 24, 6, and 70% in milk, anus, other cops and cons, respectively. Human swab 1 out of 7 was found positive for *S. aureus*. US isolates were similar to Brazil isolates. Second study was about the prevalence of MRSA in swine. MRSA was detected pigs and farm workers. Third study was about passive surveillance of clinical cases. Seventy-seven percent of the samples were found positive. He concluded that MRSA is major public issue and studying role of environment and associated with selective pressure needs to be on priority.

The second presentation was given by Hua H. Wang on antibiotic-resistant communal bacteria in foods and hosts. He started the discussion with *Lactococcus lactis* conjugation system. He also stated that communal bacteria might not be just a reservoir but potential facilitators for horizontal gene transmission. Then he gave some information about AR genes and carriers especially about functionality and mobility of AR genes. A large percentage of AR genes in food isolates remain stable without the antibiotic selective pressure. Humans are constantly exposed to bacteria from daily food consumption. He explained another study of AR in human GI tract and development of AR in human gut. The summary of the presentation was that the initial AR development in human gut is dependent from the conventional food intake and the antibiotic selective pressure. Other sources like oral exposure can be a reason. Host may play an important role in AR circulation within the microbial ecosystem.

The third presentation was about waterborne pathogens associated with food animal production systems by Mark D. Sobsey. He started the presentation with some information on antimicrobials in animal production system. The water treatment requirements are based on microbial quality of human/animal wastes. He also gave information about documented pathways for waterborne pathogen contamination (run off) from food animal farms and produce affected by irrigation waste. He also discuss about BMP treatment on anaerobic lagoons and alternatives to lagoon

treatment for microbial control. Exposure assessments do suggest pathogen risks due to animal waste. Enteric levels decrease with time in stored manure stockpiles. He summarized with points such as management production need further improvements. Human/animal health based risk approach is needed. There is an impact on surface/ground water resulting from animal waste sources.

## **S21 – Integrating Epidemiology and Microbiology to Solve Complex Food Safety Problems**

Jie Wei, University of Delaware  
Di Li, Rutgers University

The first speaker, Dr. Randy Singer, presented a talk on spatial analysis and mathematical modeling in foodborne pathogens. He pointed that recognition of food safety should be considered as a priority issues. Differing standard and/or changing food safety regulations need to be considered when necessary. Food safety management can be done through several different ways such as, supply chain management, risk mitigation, food safety infrastructure management. Food safety training and education should be carried out all the time and this requires cooperation from industry, government, as well as academia. Dr. Singer said that spatial analysis and surveillance are critical in model development on food safety issues, and risk factors that are close to each other are usually more related. He stated and showed with an example that spatial variation can provide more interesting information. In a spatial system, different measurement can be use for distance, such as linear distance, which is used most often, travel times, as well as social network relationship. How food systems are structured is critical when considering using network method. In conclusion, Dr. Singer said spatial analysis has lots of advantages as in adjustment for geographic location assessment for clustering, both global and local, and creating new variables and target interventions.

The second speaker, Dr. Ian Gardner from University of California-Davis, talked about the dilemma of different results generated from PCR and culture tests and has suggested several ways to solve this problem. He pointed out that the PCR could never be more sensitive than culture test. The suggested solutions were (1) biologically performing a perfect test; (2) logically argue about greater sensitivity of PCR; and (3) not statistically assume a perfect reference test. He concluded that both PCR and culture test should not be considered as a gold standard, and the problem could be solved mathematically.

The last speaker, Dr. Lee-Ann Jaykus from North Carolina State University gave a presentation on the risk assessment of two pathogenic *Vibrio* species, *Vibrio vulnificus* and *Vibrio parahaemolyticus*, in Gulf coast oysters. In the US, 10–20% foodborne disease was caused by seafood, and most of the illness was linked to raw bivalve mollusks. *V. vulnificus* and *V. parahaemolyticus* are the two major species. A risk assessment research was conducted to improve the understanding of ecology of these two species in raw shellfish and the efficacy of representative control strategy. The short-term objective was to adjust data gaps for the risk

assessment. Their results showed that water temperature was the most important factor that influences strains density, and seasonal effect was also observed. For the *V. parahaemolyticus*, the risk assessment was in consistent, while for *V. vulnificus*, it was underestimated. Seasonal shift was found in *V. vulnificus*. The pathogenic strains were detected most often in summer while the non-pathogenic ones were most in fall and spring; and pathogenic *V. parahaemolyticus* was detected in all seasons.

## **S22 – Third Party Certification Systems: Can It Make Our Food Safer?**

Melissa K. Hughes, Texas Tech University  
Sonja T. Jones, Louisiana State University

Craig Henry (Grocery Manufacturers Association) opened the symposium by discussing the value of certified third party audit systems to food processors. GMA encourages the use of auditors employed by certification bodies, and are accredited to international standards. He suggested that wider use of third party certification/audits would reduce the risk of foodborne illnesses. Additionally, he stated that the industry and consumers could benefit if the FDA listed all FDA-recognized audits (submitted voluntarily by manufacturers) on their website. GMA offers a food supply chain handbook online, thereby improving the supplier approval process with information on pre-assessment surveys, testing, and auditing.

Rebecca Buckner (USDA, Office of Food Protection) gave an overview about changes and new approaches needed in import strategies, the Food Safety Enhancement Act of 2009, and guidance for the industry on voluntary third-party certification programs for food. She revealed that the USDA is currently conducting a pilot study on auditing systems, and may officially recognize third party certification programs in specific product areas. There is a need to develop assurance that third party certification is a credible way to ensure food protection.

Rena Pierami (Silliker, Inc.) gave a presentation on the third party auditor's perspective of certifications systems. She explained how certified audits and assessments differ from non-certified audits, the factors that contribute to successful audits, and how certification increases the confidence that a manufacturer's processes are under control. Furthermore, she defined the accreditation/certification model and the certification process.

Following the break, Frank Yiannas (Walmart) discussed the value of third party audits to the retail food industry. HACCP alone is not the final destination in regards to food industry controls, and the game has changed for the global food supply. Following the peanut outbreak, the benefits of auditing suppliers have been questioned, and audits can be redundant, confusing, and ineffective. When done correctly, third party audits provide an additional science-based hurdle of protection that enhances safety, and provides more transparency in the food system.

Catherine Francois (CIES, The Food Business Forum) concluded the symposium by providing an overview of the Global Food Safety Initiative (GFSI) auditing systems. The mission of the GFSI to improve convergence between food safety schemes, which are developed from food laws, HACCP/GMP principles, international standards, and best

practices for specific companies. GFSI provides a guidance document online, and is a unique platform for professionals to collaborate on best practices for food safety. Finally, GFSI is currently creating an advisory council that consists of three parts: best food safety practice, global markets, and communication and stakeholder engagements.

### **S23 – A Systems Approach to Minimize *Escherichia coli* O157:H7 Food Safety Hazards Associated with Fresh-cut Leafy Greens**

*Hari P. Dwivedi, North Carolina State University  
Ravirajsinh Jadeja, Louisiana State University*

The session was opened by convenors Jan Singleton and D. Ramkishan Rao of USDA/CSREES. Panelists included Robert L. Buchanan (University of Maryland), Caroline Smith DeWaal (Centre for Science in the Public Interest) and Gale Prince (consultant). Martin B. Cole (National Center for Food Safety & Technology) presented the overview on risk assessment and management approaches on safety of leafy greens. He mentioned that with consumption of 5 million bags/ day in the United States, hazard related to contamination of leafy green specifically pathogenic *E. coli* is very high and of great concern to WHO/FAO. The safety of leafy green mostly depends on the prevention of contamination which is of the weakest hazard control. He pointed out that traceability of the contamination being very tough; reforming of risk management for leafy greens is needed. He also talked about the novel hand washing procedures for the prevention of leafy green associated infection.

Marilyn C. Erickson (University of Georgia) presented research aimed at minimizing initial levels of contamination in leafy greens. Her talk focused on the conditions under which internalization and surface contamination of leafy greens by *E. coli* O157:H7 occur in field conditions. Concluding her research findings she pointed out the significance of conditions facilitating pathogen internalization and survival within leafy greens in developing pre-harvest management practices for producing a safe product.

Elliot T. Ryser of Michigan State University talked about the role and importance of *E. coli* O157:H7 transfer from product to equipment surfaces during production of fresh-cut leafy greens. He discussed about dimensionless predictive model developed using a multi-modal process involving six transfer scenarios (pairwise transfers between product, water, and equipment) to develop microbial risk assessments for fresh-cut produce. He pointed out the significance of post-harvest cross-contamination during shredding, conveying, fluming and dewatering, due to recontamination from wash water.

Mary Tortorello (National Center Food Safety and Technology, FDA) talked about her research on minimizing an increase of *E. coli* O157:H7 in fresh and fresh cut leafy greens by minimize growth of pathogens through combination of different modified atmospheric packaging and low temperature methods. Her research mainly focused on combined effect of different oxygen levels and low temperatures on *E. coli* O157:H7 behavior in packaged spinach. After testing various combinations of temperature, oxygen level

and bacterial load she concluded that high O<sub>2</sub> level with low temperature can control the growth of pathogenic *E. coli* effectively.

Dr. Martin Cole (National Center for Food Safety and Technology) also presented an overview of risk management approach to the safety of leafy greens. He talked about *E. coli* cross-contamination modeling study in processing plant and also different combinations of treatments used in decontamination process. At the end of his talk, he suggested that a more comprehensive model can be prepared by incorporating data from field studies, transportation, consumer handling and storage.

### **S24 – Emerging Chemical Hazards in Food**

*Kirsten Hirneisen, University of Delaware  
Jeremy Chenu, University of New South Wales*

This symposium showcased the emerging issues related to chemical hazards in foods that occur from farm to retail. New approaches and technologies to assess and prevent the risks associated with chemical contaminants were discussed, including the role of regulatory bodies in controlling these issues. Dr. Beverley Hale opened the session by providing an assessment of cadmium accumulation in soybeans. The primary objective of her research was to identify the soil variables which can be used to predict soybean cadmium concentration and use this data to develop a Best Management Plan. Her findings showed that soil pH played an important role in cadmium uptake and that location is a significant source of variation beyond site-specific soil chemistry characteristics.

Abu Alam from AECOM discussed the persistent organic contaminants in water. Dr. Alam focused on what are the organic compounds present and water and what are their sources and characteristics. The talk emphasized how the molecular structure and weight greatly affect the treatment necessary to remove these very small compounds and also the methods commonly used for removal. Dr. Alam briefly discussed the impact of these organic compounds in water on wildlife and their ecological impact.

Richard Stadler highlighted the mitigation of processed-induced food toxicants including acrylamide, furan, 3-MCPD esters, benzene and styrene. In doing so, he focused on the key updates of the CIAA Acrylamide Toolbox and emphasized that the application of a holistic risk-benefit modeling approach is paramount when defining priorities in food toxicant risk management.

Chemical contaminants occurring in foods due to migration from packaging materials were discussed by Forrest Bayer. His presentation separated fact from fiction in cases associated with food packaging contaminants including bisphenol A; 2-isopropylthioxanthone print ink in milk; semi-carbazide; and antimony in Canadian spring water. These examples illustrated that risk perception of food contact surfaces may differ from scientific reality.

Issues and challenges with the use of nanomaterials in food and food packaging applications was discussed by Bernadene Magnuson for Cantox Health Sciences International.

Current applications of nanotechnology include applications in all industries including foods. Her talk focused on engineered nanoparticles to improve food ingredients, food processing, packaging and food safety. Many nanomaterials can have antimicrobial affectivity such as silver which has the ability to be applied to other antimicrobials to make films which can be applied to both the food and medical industries. Consumer acceptance and environmental impact appear to be the largest hurdles for nanotechnology to overcome especially in regards to the food industry.

Nega Beru of the Center for Food Safety and Applied Nutrition of the US FDA spoke on managing chemical contaminants in foods. The focus was on how the FDA deals with chemical contaminants in foods from both processing and the environment including acrylamide, furan, perchlorate and dioxin-like compounds. Dr. Beru emphasized the importance of further understanding the mechanism of acrylamide formation in foods through cooking methods and showed data from sampling a wide variety of foods for the various chemical contaminants.

### **S25 – Food Safety Challenges for Unrefrigerated Display of Ready-to-Eat (RTE) Foods**

*Shivani Gupta, Colorado State University  
Arpan Bhagat, Perdue University*

The first presentation delivered by Kathleen A. Glass was on "Microbiological Challenges of Unrefrigerated Display on Refrigerated RTE Foods" in the United States. Guidelines for storage of potentially hazardous foods (PHF) at different temperature/time combinations are available in food code (2005). According to the pH and  $a_w$  table, the food products with pH < 4.2 and water activities below 0.88 will not support microbial growth. However, food products with higher water activities (>0.92) and pH (>5.0) will support the growth of different foodborne pathogens and impose higher risk. The pH and water activities of food products differ from in lot to lot production and changes during storage. This necessitates unified guidelines for refrigerated food products. National Advisory Committee on Microbiological Criteria for Foods (NACMCF, 2009) report. Food processor can take help from published literature, food code tables, and various predictive models and/or conduct their own challenge studies to develop time/temperature guidelines for refrigerated food products during display.

The second speaker Sharon Wood talked about the US retail food industry practices and perspectives on ambient display of RTE foods. Time is important for safety and quality of PHF. Control is essential not only to maintain microbial safety and quality of food but also to minimize changes in biochemical and physical properties of foods. Training and education of food handlers is important tools for execution of food safety practices. Some of best practices to be followed at food service level include labeling of food products with legible labels for refrigerated storage during display.

Third presenter, Christina Belperio, spoke on temperature control of displayed potentially hazardous foods in Australia. Food Standards Australia New Zealand (FSANZ)

is the national food safety standard setting authority that oversees implementation and execution of food safety within Australia and at the border. Food standard code 3.2.2 clause 8(5) requires a food business must, when displaying potentially hazardous, under controlled temperature range to minimize growth of pathogens that may be present or to prevent formation of toxins in the food. According to food handling survey (2007) report with introduction of food safety standards in manufacturing to retail level, there is significant improvement in public health and safety.

The final presentation from Dr. Roy Betts discussed about European perspectives and directives on ambient display of chilled RTE foods in retail food locations. EC regulation 2073/2005 governs chilled RTE foods for cooking or other processing effective to eliminate or reduce the microorganisms of concern to an acceptable level. With growth in chilled food market, two durability indicators imposed by EU food labeling directive 2000/13/EEC are used by date and best before date. Only preservation system in chilled foods is chilling. All dates set by entrepreneur are based on temperature from predicted models considering limited consumer abuse. If abuse for longer time, then shelf life decreases and product becomes unacceptable before marked date and sometime compliant enforcement action taken to remove that product from commerce.

### **S26 – Shigatoxin *Escherichia coli*: The Bad, the Worse, and the Pathogenic**

*Hari Prakash Dwivedi, North Carolina State University  
Sarah Dierschke, University of Wisconsin*

Mohamed Karmali of Public Health Agency of Canada presented the first talk of the session on comparative genomics as an aid to identify the pathogenic STEC. He talked about the clinical features and public health significance of STEC. He also discussed about the comparative genomics of non-O157 STEC. He elaborated on the approaches to develop assays based on pathogen evolution and various markers specific for STEC. Later on, he discussed about the classification of STEC/VTEC serotypes into seropathotypes. At the end, he talked about different *E. coli* O157:H7 strains implicated in various outbreaks and their detection using advanced strain typing and diagnostic methods including techniques such as molecular serotyping and in-silico genomic analysis.

Peter Gerner-Smith (CDC, Atlanta) spoke on road map to the investigation of pathogenic STEC outbreaks and about Pulse Net-USA program and its role in molecular investigation of outbreaks. Pulse Net program includes the molecular typing of STEC by PFGE. He discussed about the O157 and non-O157 STEC submitted to Pulse Net in 2008. According to him, non-O157 STEC serogroups O26, O111, O103, O45, O121, and O145 have been reported to Pulse Net in 2008. He figured out that serotype is not independently associated with virulence. He also discussed about various STEC outbreaks and associated vehicles. He concluded that STEC is still a problem while not much is known about non-O157 stains. Although different produce related outbreaks have increased in number, beef still remains an important vehicle for STEC outbreaks. He emphasized on

virulence characterization and refining techniques to identify particular strain type.

Jenny Scott of Grocery Manufacturers Association presented the perspective of the United States food industries on the emerging threat of STEC. She talked about the concern of industries about non-*STEC* serogroups which have been related to several illnesses in the United States. She emphasized that non-*STECs* are a significant risk and needed to be addressed while designing HACCP programs. She also raised the issues as which *STECs* are of concern? How to detect non-O157 *STECs*? She further pointed out that interventions are needed for effective control of non-O157 strains. At the end of her talk, she concluded that besides the presence of dangerous *E. coli* O157, non-O157 *STECs* are emerging and rapid detection methods are needed for their early detection.

Peter Feng (FDA) was the last speaker of the session and he talked on the perspective and need of analytical methods for *STECs*. He pointed at the increase in the number of infections related to non O157:H7 *STEC* through 2001 to 2006. He emphasized on the variants of shiga toxins and their significance in detection of the pathogen. He talked about the complexity of shiga toxin-producing bacteria including *STEC*. Later on, he discussed various aspects of *Stx* (toxin) and *STEC* detection in contaminated foods. His conclusion focused on various strategies for confirming *STEC* based on detection of *Stx* toxin and/or *stx* gene with help of microbiological techniques, serology and DNA amplification technology.

### **S27 – Focusing Our Efforts: Vulnerability Assessment and Mitigations Research in Food Processing and Handle Default**

*Vanija Kallur, Alabama A&M University  
Anne Vercammen, K.U. Leuven, Belgium*

*FDA's Food Defense Program: Vulnerabilities and Mitigations (Lee-Anne Jackson, Ph.D.)*

Food defense is the protection of food products from intentional adulteration by biological, chemical, physical or radiological agents. It should be everyone's concern, as no specific targeting information indicating attack on food supply is imminent and the use of biological or chemical weapons against food supply could cause mass casualties. Therefore, a vulnerability assessment which focuses on a limited number of foods and agents that are of great concern and allows targeting resources of different areas is needed. As such, the CARVER plus Shock method was designed for food sector vulnerability assessments. This method breaks the food system down into the smallest pieces in the farm-to-table continuum via a flow diagram. There are 7 factors that affect the desirability of a target: Criticality, Accessibility, Recuperability, Vulnerability, Effort, Recognizability and Shock. In addition, a Strategic Partnership Program in Agro terrorism (SPPA) was developed. This is a collaboration between the FDA, DHS, USDA and FBI with the state and industry volunteers. The overarching observations are that the industry can influence the vulnerabilities and accessibility the most and mitigation strategies are sensitive. In addition, the nation's awareness for terrorism has been increasing and there is a growing focus on

protecting the nation's food supply. FDA and their partners will keep sharing alert messages and help to raise food defence awareness.

*Food Defense 2009 (Gale Prince)*

There is change in the tactics of enemies which include local people and lone wolf operations. Threats to poison food are received through letters, calls and emails where the agent is chemical. Recalls of pet foods, the consumers ask questions regarding human food. Thus, product safety challenges in 2009 can be met by taking food safety seriously, by understanding the product and their operations, looking for hazard, designing control measures, auditing the system and focusing on microbes, chemicals, etc. The three 'P's in food defense can be property, people and product. The risk management should include looking for operations, identifying products, identifying nodes and processing control. Food at high risk include large batch size, short shelf life and food with uniform mixing of contaminant.

*Mitigations Research (Shaun Kennedy)*

Strategy of food defense includes supply sufficiency, system reliability, system resiliency and protection. The aggressor of food defense may be disgruntled/compromised/covert insider or suppliers with objectives of system disruption, mass morbidity/mortality, brand damage or trade disruption. Food safety strategies should be detected and diagnosed. Food defense solutions include sensitive detection of bioluminescent marine bacteria, microfluid in line detectors using threat agent specific membrane barrier. Carver+shock helps in identifying nodes that are most likely targets for terrorist attack by applying analysis to each node. It considers 7 factors-criticality, assessability, recuperability, vulnerability, effect, recognizability and shock. Its Version 2 coming in 2009. It will have increased usability and will focus on accessibility and vulnerability. New tools are coming but zero risk is unachievable, all we can do is to reduce the risk.

### **S28 – CSI: Beverage Plant: On the Trail of Hot- and Cold-fill Spoilers**

*Jeremy Chenu, University of New South Wales  
Ch.V. R. Kumar Tammineedi, University of Georgia*

Resembling a Crime Scene Investigation theme, this symposium focused on the detection, investigation and prevention of spoilage incidents in hot- and cold-fill beverages. Emilia Rico-Munoz commenced the session by outlining the challenges and methodologies encountered during the investigation of spoilage in heat-processed beverages. The major challenge presented is that contamination may occur "without a trace" and investigation is often expensive and time-consuming. Heat resistant moulds produce ascospores that survive the pasteurization process and are activated by heat-shock. Rico-Munoz emphasized this principle in the investigation process and the need for beverage manufacturers to use their own product when performing heat-resistance studies.

Gordon Hayburn from The Tetley Group LTD, explained about Tea, the nature of spoilage of tea, spoilage prevention strategies and corrective action plans. The flow

chart of Ready-to-Drink (RTD) Tea manufacturing process is explained. The important steps to consider in this process are pasteurization, filling, capping and cooling. Microbial spoilage of RTD tea is mainly attributed to heat-resistant and slow growing molds. Sources of contamination of RTD tea are soil, tea, other ingredients like water and liquid sugar, packaging and processing environment. A wide variety of microorganisms, including heat resistant molds, have been isolated from the above sources. The spoilage of RTD tea is mostly occurred due to the survival of heat-resistant molds. These aerospores can get inside the bottles before the filler and cause problems. A strategic plan should be developed to detect the spoilage of product and to Investigate and analyze the cause and source of spoilage.

Wilfredo Ocasio from The National Food Laboratory Inc., talked about aseptic filling, advantages of aseptic processing and also the drawbacks like the complexity of processing. He gave an overview on a case study of spoilage of a smoothie type high protein beverage. The beverage is aseptically filled in 16 oz. PET bottles with pressure seal and no head space flush. No preservatives are added to the product. The spoilage of the product is that the pH is slightly decreased and there is little or no gas. The complexity of aseptic systems makes investigations very difficult. Investigation requires multidisciplinary teams. More importantly it requires time and commitment.

Kathleen Lawlor from PepsiCo presented a case study of spoiled hot-fill orange juice in PET bottles in two manufacturing facilities. The spoiled product was characterized by bloating, leakage, separation and increased acidity, with a defect rate of 1–8%. Initial results from a root-cause investigation confirmed a 40-fold increase in lactic acid bacteria in swollen products. In addition, severe sealing-surface package defects including bottle finish dents and abrasions and liner delamination fractures were observed. These findings lead to a cooling water study, which found *Lactobacillus fermentum* in the cooling water and spoiled product. A root-cause analysis by bottle/closure vendors implicated bottle descrambling equipment as the source of deep sealing surface finish dents. Liner wrinkling lead to microchannel formation, suggesting that watertightness does not necessarily indicate hermeticity. Short- and long-term corrective actions were implemented to mitigate a repeat of such spoilage. Ultimately, it is important to anticipate or prevent conditions that can lead to a perfect storm.

### **S29 – Food Safety Programs across an Integrated Poultry Industry**

R.D.C. Pardeepinder Kaur Brar, University of Florida  
Aikansh Singh, University of Nebraska-Lincoln

Dr. Paula J. Fedorka-Cray, bacterial epidemiology and antimicrobial resistance research unit, Athens, GA, delivered a lecture on Antimicrobial Resistance in Poultry Processing Environment. She emphasized that intensive livestock production create ideal state for infection and clinical illness to manifest. She discussed various factors that effect *Salmonella* bacteria in poultry like age, health, diet and medication of chicken. She talked about one study and concluded that *Salmonella* serotype Thompson is most frequent in poultry

environment and second is Senftenberg. Most bacteria are resistant to Gentamicin, Streptomycin and Sulfanoxazole. She also put forth multiple antimicrobial resistance by *Salmonella* serotype like 7.7% of Brandenburg is resistant to 10 antimicrobial and 50% of Typhimurium is resistant to 5 antimicrobial. Human *Salmonella* has 80% susceptibility to antimicrobial. She showed the data to illustrate that resistance among turkey isolates has increased over time from 1997–2008.

Dr. Billy Hargis, professor and director at the University of Arkansas, discussed Microbial Challenges and Interventions on Farm during the symposium. He said that pre-harvest testing and scheduling of flocks has been successfully used to reduce post chill *Salmonella* incidence in poultry. He mentioned various sources of flock Intervention as feed, rodents, animal vector, residual *Salmonella* on farms but *Campylobacter* sources are still in debate. According to him, feed treatment, rodent control, biosecurity, antibiotics, non-antibiotic chemicals, bacteriophages, probiotics, vaccines are various potential interventions.

The third presentation was given by Shane Calhoun on microbial interventions used in poultry processing. The speaker stated that microbial contamination exists in two primary areas external and internal. The speaker also gave stress on each step in processing and pointed out pre scald is often overlooked. Brush and pressure water application to remove macro and micro organics. There can be up to 40% reduction in microbial load from brushing. Chlorine can be added to the picking rails for reducing microbial load. Online processing can be made more effective by cabinet rinse with acid and stream. Chilling (< 36°F) can be most effective step in controlling microbial proliferation and final chiller should maintain pH of 2 or below. Also if we have more positive samples for presence of pathogens then check microbial load consistency of antimicrobials, chiller, etc.

The last talk was about managing food safety across a vertically integrated company by Scott Stillwell. He pointed out raw materials to be a critical factor in controlling the microbial load in the final product. Each step in the flow chart of product preparation should be given equal importance as any step can introduce contaminant to the final product. Physical contaminants include bones, wires, stainless steel screws, glass, etc. The chemical contaminant includes pesticides, heavy metals, mycotoxins, hydrocarbons, etc. He also gave stress on chilling the animals for a lower risk of food poisoning. Special importance should be given for critical control elements of animal health and welfare. He concluded stating *Salmonella* presence was decreased in broilers and increased in humans.

### **Special – The War on Water: Cleaning for Processors of Low $a_w$ Food**

Reshani Nisansala Senevirathne, Louisiana State University  
Sonja T. Jones, Louisiana State University

Jeff Kornacki (Kornacki Microbiology Solutions) started the session with "Do's and Don'ts of Evicting Unwanted Residents Getting Rid of *Salmonella*, *Listeria* and Other Bad Characters from Dry Clean Environment." He mentioned in his talk there were 76 million cases, 325,000 hospitalizations and 5,000 deaths occurred due to foodborne illnesses. He used a chocolate company as an example and explained



the mode of contaminations of *Listeria*. *Listeria* can be introduced by people with improper sanitation, through dry whey or non fat dry milk. Microbial growth can be reduced by reducing proximity niches to the product stream and the number of niches. Improper sanitary equipments such as brooms can spread the bacteria by splashing; keeping mops upside down can increase contamination by dripping down the bacteria, and wet drains. Hence contamination can be reduced using proper sanitary equipment with dry clean environment in the working area.

The second speaker, Joe Stout, Kraft Foods, spoke about the "Validation of Allergen Removal." In his talk, he mentioned the main allergen contamination methods are carryover and cross-contamination. The best method to overcome this problem is following the proper HACCP plan for allergen control and validates a process start with a cleaning plan. Phil Wolfe (USDA) presented, "Dry Cleaning of Powders Products," which primarily centered on cleaning of dairy equipment. He suggested that the drying chamber and separation equipment should be wet washed and packaging equipment should be dry cleaned; however, alcohol and vacuum cleaning can be performed as well.

Suzanne Tortorelli (Campbell's Soup) and Kelly Stevens (General Mills) talked about "Dry Cleaning in Bakeries and Cereal Processing," which focused on bakery and cereal platform cleaning challenges (i.e., sanitary design principles). They used a case study (Bread Pudding O's) to expound the decision path of the cleaning process. Moreover, the total productive maintenance (TPM) model was discussed in depth in its relationship to sanitation. This model suggest being proactive vs. reactive; should include total employment involvement; sanitation is built in the process; integration into daily work; design equipment right the first time; and zero losses.

Lastly, Linda Harris (University of California, Davis) discussed "Dry Cleaning in Peanut/Nut Operations," where almonds were used as the example product. It was mentioned that almonds led recognition of *Salmonella* contamination in nuts and prior to 2001 farmers were not practicing good agricultural practices (GAP). Coincidentally, Huller/Shellers (intermediate packers) were not registered as food processing facilities which did not follow GMPs resulting in contamination issues. Interestingly, *Salmonella* persisted in facilities eight months after isolation detected in samples. Presently, there are ways to dry clean/sanitation and control *Salmonella*—control dust; avoid air blowing; and avoid the use of water. Recommendations for the future were much better sanitation designs of equipment and validation of cleaning/sanitation protocols.

#### **Student Debate – Pros and Cons of Zero-tolerance Policy for Pathogens in Food**

Jeremy M. Adler, Colorado State University

Dr. Caroline Smith-DeWaal, from the Center for Science in the Public Interest, indicated that zero-tolerances are an enforcement tool applied to hazards signaling the highest level of public health protection. It is terminology that the public can understand. Zero-tolerance is a goal that industry can aspire to and is necessary to assure food safety. However, as currently implemented the policy has not been very effective in meeting the Healthy People 2010 goals for the reduction of foodborne illness. She also mentioned

that as sampling and testing strategies evolve the definition of "zero" will change because there is a detection limit associated with each. An acceptable replacement for a zero-tolerance policy would be the development of government mandated performance standards which would also allow for innovation to help improve food safety.

Dr. Robert Buchanan, from the University of Maryland, stated that zero-tolerance emerged as a result of the inability to establish attainable microbiological criterion that may be used as benchmarks to establish the safety of food. Statistically speaking, zero-tolerance is unachievable unless 100% of the product is tested. Also, he pointed out that the presence/absence determination is based on the detection limit, which is a microbiological criterion, of the testing method used. Setting microbiological criterion will allow for the separation of residual risk, the risk associated with sporadic cases of illness, and a production system that is out of control, a system associated with outbreaks of illness. The differentiating between the two causes of illness will allow for a better communication of risk to the public and identification of areas within a process for improvement to improve food safety.

Dr. Dan Englejohn presented the USDA-FSIS perspective concerning a zero-tolerance policy. For the agency, zero-tolerance is a practical means to identify acceptable and unacceptable lots of food that is to enter into commerce. However, as it applies to industry, the identification of an unacceptable lot indicates a food safety system failure. From this perspective, zero-tolerance policy has yet to control pathogen in ready-to-eat meats produced at the retail level and raw meat products. Dr. Englejohn mentioned that the agency is interested in establishing a framework to discern between sporadic and systemic failures in NRTE products and developing control trends in NRTE and RTE products. This information would help the agency identify areas of food safety concern within industry.

Dr. Russell Flowers from Silliker, stated that the practical implication of zero-tolerance is to assure the absence of pathogen. However, it is impossible to assure the absence of pathogen in a non-sterile product. When there is no tolerance for knowing the pathogen could be present, it encourages companies not to test for the pathogen to avoid product loss and recalls. Instead, it would be much better to establish Food Safety Objectives and Performance Objectives based on risk assessments. These would acknowledge the presence of pathogen and encourage the testing for its presence in food. The testing data would be essential to reducing the level and incidence of pathogen in the food chain.

#### **Closing Session – John H. Silliker Lecture: The 2008 Irish Dioxin Crisis: A Public Health, Food Safety, Economic, Legal, or a Risk Communication Challenge?**

Aikansh Singh, University of Nebraska – Lincoln

This lecture was given by Dr. Patrick Wall from University College Dublin, School of Public Health and Population Sciences, Belfield, Ireland. The speaker presented an overview of a recall of all Irish pork products due to the presence of dioxin in pig feed. Ireland exports a lot of meat products including beef, pork, lamb, etc. The legal limit of dioxin allowed in the pork meat is 1 picogram (pictogram =  $10^{12}$ ) per gram of meat. One French sample also came

positive for dioxin but that was originally from Belgium. This issue became famous worldwide and countries made every effort to make their customer believe. The speaker also gave an overview of Belgium crisis along with a discussion on European Union food law and EU hygiene package. He also pointed out that food can move freely among all European Union countries. The food export estimated 11.36 billion dollars in 2008. One important factor to be considered during the whole chapter of dioxin incident was the time frame which took to drive a conclusion and for necessary steps to be taken. 18–20 picograms of dioxin per gram was found in the contaminated samples. This crisis initiated the need of creating independent national food agencies in every country. Speaker also discussed about foot and mouth disease impact on UK. All this encouraged rapid alarm systems which can disseminate any problem regarding food. This outbreak showed a need of pork risk assessment and special consideration towards pork safety.

## TECHNICAL SESSIONS

### T1 – Dairy, General Microbiology and Sanitation

Amit Morey, Auburn University  
Feifei Han, Louisiana State University

Scott K. Crerar from New Zealand Food Safety Authority presented the development of a legislative framework of raw milk products in New Zealand. By defining three broad categories, this could allow more efficient and effective regulation of a range of raw milk products in New Zealand.

Kathleen A. Glass from University of Wisconsin talked about different treatment on the effect of the growth of *Listeria monocytogenes* in cold-filled cottage cheese during cooling. The result showed that certain natural microbial inhibitors would delay or prevent the growth of *L. monocytogenes* during slow cooling.

Jasdeep K. Saini from Kansas State University evaluated the potential for translocation of *L. monocytogenes* from drains to food contact surfaces. The study indicated that the closer the surface from the drain, the greater the number of bacterial cells that transfer from the drain to the surrounding surfaces.

Cristina D. Cruz from New Zealand Institute for Plant & Food Research presented that study of assess the bactericidal concentration of 24 sanitizing agents against 20 *L. monocytogenes* strains. The results showed that all sanitizers were effective against planktonic *L. monocytogenes* and biofilms are more sensitive to certain chemicals with high oxidizing power.

Amit Morey from Auburn University talked about the efficiency and optimization of UV to reduce *L. monocytogenes* on conveyor belts made of four different belting materials. The result showed that the bacteria count was significantly reduced on all the belts irrespective of energy intensities and time of exposure.

Michael T. Musgrove from USDA/ARS spoke about the Enterobacteriaceae and other related organisms isolated from egg contact and non-contact surfaces in a commercial shell egg processing facility. Enterobacteriaceae genera recovered accounted for 91.4% of identifications and the other 8.6% included *Aeromonas*, *Aquaspirillum*, *Pseudomonas*, *Vibrio*, and *Ralstonia*; this could be helpful to develop more effective sanitation programs.

Renata Jacob (Drexel University, PA) gave a presentation on the food safety risk associated with retail markets serving Asian populations in US. She found that 73% tofu samples had aerobic plate counts  $> 10^6$  CFU/g while 5% and 3% of samples had *E. coli* and *Staphylococcus aureus*, respectively.

John Holah of Campden BRI (UK) presented details on various sanitation schedules for wholerom, in-production, end of production and periodic sanitation. John Holah presented Alicaja Malinowska's paper on wholerom disinfection using ozone and hydrogen peroxide. They found that hydrogen peroxide reduced *Bacillus globigii* and *Geobacillus stearothermophilus* levels by approximately 6 logs while ozone gave a 2–3 log reduction for *E. coli*, *Pseudomonas aeruginosa* and *L. monocytogenes*.

Louise Fielding (Cardiff School of Health Sciences, UK) presented a review of current literature available to public on microbiological safety of irradiated products. She concluded that the type of food and food storage conditions influence the lethality of irradiation on microorganisms.

Dominic Bagenda from Hokkaido University (Japan) spoke on the potential application of agar to increase the pediocin production and reduce roe degradation. Application of pediocin from the semi-solid broth inhibited *Listeria monocytogenes* for 6 day as compared to 3 days from pediocin obtained from liquid broth.

Paula Fedorka-Cray from USDA presented her research on the "effect of colony numbers selected from plating media on *Salmonella* serogroups detection from naturally contaminated chicken carcasses". She found that use of different culture media can influence the growth of different *Salmonella* serogroups and that picking single colony instead of three can underestimate their diversity.

### T2 – Antimicrobial, Seafood, and Non-microbial Food Safety

Huda Neetoo, University of Delaware  
Roniele Cordeiro, University of Manitoba

Peter Taormina measured the short-term efficacy of Laurel Arginate (LAE) against *L. monocytogenes* present on various surfaces of hams. Log reductions of *L. monocytogenes* were  $> 2$ -log CFU/package on all ham types except one. Within each ham type, log reductions were not significantly different between treatment volumes spanning a 4-ml range. In his second presentation, Peter Taormina elucidated the optimal conditions of post-lethality LAE application to frankfurters destined for vacuum-packaging. All treatments resulted in reductions of  $\geq 1.68$ -log CFU/package, and many of the treatments caused  $> 2$ -log reduction within 2 days, with no further declines evident at day 8.

Alex Brandt demonstrated that the combination of acidifying antimicrobials Octanoic Acid and Acidic Calcium Sulfate produced an additive-type inhibition upon *L. monocytogenes* *in vitro*.

Rebecca Brown determined the effect of gaseous ozone on survival of surface attached *L. monocytogenes* isolated from the floor drains of a chilled ready to eat food processing plant. The reduction of *L. monocytogenes* is concentration dependent.

Paula Fedorka-Cray compared the antimicrobial resistance profiles of *Campylobacter* isolates originating from 3 different types of poultry production facilities. Resistance

to tetracycline was most common across all 3 production facilities, with 59%, 42%, and 16% for broiler breeder, broiler, and leghorn isolates, respectively.

Mohammad Obaidat determined the ability of the vapor of allyl isothiocyanate, cinnamaldehyde and carvacrol to inactivate surface-attached and tissue-infiltrated *E. coli* O157:H7 on lettuce and spinach. Overall, greater inactivation occurred on lettuce than on spinach leaves and on the leaf surfaces than within tissue.

Sarah L. Edmonds showed that a novel two-step hand hygiene solution coined "SaniTwice" had a comparable antimicrobial efficacy as a conventional non-antimicrobial handwash. Her findings thus highlighted the plausibility of using a practical hand hygiene alternative by food handlers in remote food service locations where water is scarce.

Dr. Paw Dalgaard presented his work on the development of models to predict the extent of biogenic amine formation in seafood co-inoculated with *Morganella morganii*, *M. psychrotolerans* and *Photobacterium phosphoreum* (major players in histamine production) stored at constant or dynamic storage temperatures. His research should be invaluable in predicting the chemical shelf life of seafood.

Hudaa Neetoo demonstrated the efficacy of alginate-based antimicrobial coatings incorporating lactate and diacetate to inhibit the growth of *Listeria monocytogenes* in sliced and filleted cold-smoked salmon.

Dr. O. Pete Snyder described the scientific grounds for using HACCP plans in retail food process development. Dr. Snyder demonstrated the importance of each component or term in the ICMCF equation used in process design. Overall, his study highlighted the robustness of this model widely used by large chain operations and kitchens.

Dagmar Schoeder presented her findings on the unprecedented incidence of melamine (a chemical contaminant) in milk powder and infant formula of international market brands sold on the Tanzanian market. Her investigation clearly demonstrates the gravity of the situation especially because milk powder is widely used as a food aid for millions of under-nourished infants, young children and invalids.

### T3 – Applied Laboratory Methods

Feifei Han, Louisiana State University  
Kirsten Hirneisen, University of Delaware

Mindi Russell spoke on the comparison of different pre-enrichment strategies for the recovery of *Salmonella* from internally contaminated red round tomatoes. This study concluded that alternative pre-enrichment methods of quartering and stomaching were equivalent to each other and better than current *Bacteriological Analytical Manual* (BAM) *Salmonella* culture methods.

Nathan Miller's research was about the rapid detection of *Salmonella* Typhimurium from spiked lettuce and tomatoes through the use of real-time reverse transcriptase-PCR. The assay (real-time RT-PCR after pre-enrichment) gave for more sensitive and rapid detection of *Salmonella*.

Research on the development of quantitative real-time PCR method for the detection and characterization of toxigenic *Clostridium difficile* in food animals and retail meat products was presented by Deena Bermudez. They were able to correctly identify and detect *C. difficile* using the tpi and toxB probes under multiplex conditions.

Patrice Chablain presented ISO 16140 validation of a real-time PCR method for the simultaneous detection of

*E. coli* O157:H7 and *Salmonella* spp. in beef in 10 hours. Two multiplex PCR assays were developed and combined and validated according to the ISO 16140 standard. This multiplex PCR method was AFNOR approved since results were equivalent to standard methods.

Research on the independent laboratory evaluation of a real-time RCR test for detection of *Listeria* spp. in selected foods from one single primary enrichment was presented by Leslie Thompson. The real-time PCR method was able to detect *Listeria* in deli turkey and on stainless steel.

### T4 – Education and Novel Laboratory Methods

Sarah Markland, University of Delaware  
Aikansh Singh, University of Nebraska – Lincoln

This technical session begun with a presentation from David Kerr of BioControl Systems Inc. on comparison of assurance GDS for *Listeria monocytogenes* and *Listeria* species with culture methods for detection in foods and environmental surfaces. *Listeria monocytogenes* and all other species were used on the same foods and surfaces. It was concluded that assurance DS was found to be equivalent to reference detection methods.

Abby Nutsch, from the Food Science Institute of Kansas State University, then spoke about defining areas in food safety and defense where development of curriculum is needed through the use of stakeholder input. A three day DACUM (Developing A Curriculum) workshop was developed where a panel of food safety experts came together to put together a curriculum to teach a graduate and professional level course about food safety and defense. Research and communication of food safety and defense principles were named as the two most important elements.

Rebecca Dittmar, from Texas Agrilife Extension Service, presented a study about the development of a Certified Food Manager (CFM) course in order to improve safety habits of employees in the food industry. Surveys taken by employees after the completion of the course demonstrated that there was a significant improvement in good food safety behaviors.

The next speaker, Robert Scharff from Ohio State, spoke about the economic and health costs related to foodborne illness. The costs of foodborne illness are much higher than previously described by older models and is expected to continue rising. These costs are causing cuts in federal funding of research and development including the area of food safety.

Junehee Kwon, from Kansas State University, presented about the need for food safety training in independent ethnic restaurants. Results of this study demonstrated an increased need for food safety training in these types of restaurants. It is necessary to develop culturally sensitive training for these restaurants and to incorporate ethnic food characteristics into training.

The speaker was Patrick Mester and the topic of discussion included three major parts of application as separation and concentration of target organisms in food, validation of detection and process controls at each step. The detection limit was 7.3 CFU/g. Major drawback was the non-processable characteristics of cellulose and starch. Ionic liquids are basically organic salts that have good thermal stability (over 300°C). Method was found to be time and cost effective.

The next speaker Adrian Parton discussed about immuno-magnetic separation techniques to aid the capture of pathogens from food. This has restriction on the sample size to be analyzed. Magnetic beads catch hold of microorganism and rest of sample washes out. Magnetic beads sit at the bottom in the direction of elution.

Next topic of discussion was about the evaluation of Premitest *Salmonella* for rapid serotyping of *Salmonella* strains isolated from farms in southern Brazil by Priscilla Karina v. Koerich. They made a standard of no *Salmonella* in 25 grams of food sample. The advantages included easy to use and rapid results. It was followed by a talk on PCR primers from Naoki Shinoda, PCR primers for feed inspection require specificity and sensitivity. The speaker also provided with some information on specific primers like ruminant specific primers. The last presentation in the session was about the comparison between reverse transcriptase loop mediated isothermal amplification (RT-LAMP) and RT-PCR by Chayapa Techathuvanan. The conclusion stated RT-LAMP to be significantly faster with improved detection limit and suitable for routine diagnosis of *S. Typhi*. It was possible to detect *Salmonella* in pork within 1 day.

### T5 – Produce

Gashaw Mersha Tessema, Addis Ababa University, Ethiopia  
Jessica Butler, Auburn University

Dr. Manan Sharma spoke on the internalization of *Escherichia coli* O157:H7 in spinach grown in soil and hydroponic media. They did see increased internalization ability of *E. coli* in the hydroponic media but it seemed unlikely.

Dr. Jitu Patel spoke on the ability of *Salmonella* spp. to attach to certain types of produce i.e. lettuce and cabbage. Her results showed that attachment of different *Salmonella* spp. varied as well as the medium it was attaching to.

Dr. Xiangwu Nou report on the effects of fresh produce crops on the survival of *E. coli* O157:H7 in soil determined that no significant proliferation of *E. coli* strains occurred during the 5 week biomass period. However, it was affected by the type of decaying biomass.

A report on *E. coli* O157:H7 transfer from equipment surfaces to lettuce during processing was presented by Ms. Annemarie Bucholz. She proved that *E. coli* was persistent on equipment and therefore contaminating large amounts of leafy greens and that this information is critical to developing a transfer model.

Dr. Carol D'Lima gave a presentation on the preharvest internalization of bacteria into melons from irrigation water. They found that upon a high dosage of bacteria into the water there is a risk of transfer for enteric pathogens into the melon vines.

Ryan Wist gave a presentation on the influences of irrigation methods on coliform internalization in blueberries. He reported that enforcing the best irrigation techniques is critical because the fruit tissue is susceptible to the uptake of coliforms.

Biocontrol of *Salmonella* in developing tomato fruit with a combination of lytic bacteriophages and antagonistic bacteria has been presented by Jianxiong Ye and concluded that the use of biocontrol preparation enhances the mi-

crobiological safety of tomatoes as it potentially controls *Salmonella* in the field environment.

Courtney O'Brien also presented on the efficacy of  $\text{ClO}_2$  as a post harvest disinfectant for stone fruit, indicated that  $\text{ClO}_2$  is an effective post harvest disinfectant to minimize foodborne pathogens on stone fruit without inducing quality loss and visual defects.

Bassam Annous on the other hand presented on hot water surface pasteurization vs. chlorine wash for reducing populations of *Salmonella* Poona on artificially inoculated tomatoes. The result indicated that surface pasteurization enhance the microbiological safety of tomatoes with no adverse effect on the maturation process and extended the shelf life of this commodity especially if refrigerated soon after harvesting.

Jie Wei discussed on attachment of norovirus in manure and biosolids to lettuce. With the use of confocal microscopy, murine norovirus (MNV) was observed on the surface and on the cut edge of lettuce. After attachment, guard cell is used for internalization and MNV was stable on lettuce without reduction following incubation. The incubation time of MNV in manure and biosolids did not affect attachment.

Peter Rossmannith presented research on the statistical data analysis of real-time PCR results derived from single copy amplification. The objective of this study was to evaluate a validation tool for real-time PCR assays. The results showed that an absolute validation of real-time PCR is possible and this validation tool allows on-line monitoring of real-time PCR results.

Shu Chen from University of Guelph evaluated the multiple-locus variable number of tandem repeat analysis for sub-typing *L. monocytogenes* isolates in pure cultures and in food matrices, which showed it was simple, highly discriminatory, and easy to perform with portable results.

Feifei Han from Louisiana State University used a novel DAN amplification method: loop-mediated isothermal amplification (LAMP) to quantify *Vibrio vulnificus* in oysters, which could quantitatively detect 10 CFU in the pure culture in less than one hour.

Beatriz Quinones from USDA/ARS/WRRRC presented the study of developing a novel and simple fluorescence cell-based assay for the detection of *Stx* and for identifying natural plant compounds for anti-*stx* activities, which indicated it was accurate and sensitive method to detect *stx2* activity and can be utilized to identify toxin inhibitors.

Tineke H. Jones from Agriculture and Agri-Food Canada optimized the recovery of concentrated F-RNA coliphage MS2 from Microsep 100K ultrafiltration devices, which may be applied for concentrating a wide range of other viruses.

Leslie K. Thompson from Silliker, Inc. compared the the VIDAS® *E. coli* O157:H7 Phage technology (ECPT) test to FDA BAM reference methods in lettuce, spinach, and spent irrigation water, and this rapid alternative method was found to be statistically equivalent to the reference method.

Frank R. Burns from DuPont Qualicon finalized the whole session by presenting a method to concentrate *E. coli* O157:H7 and *Salmonella* independent of the expression of surface antigen, which allowed for target concentration of pathogens in short of time.

## T6 – Meat and Poultry Epidemiology

Jeremy Chenu, University of New South Wales  
Roniele Cordeiro, University of Manitoba

Alejandro Pérez provided updated data on the food commodities associated with *Salmonella* Enteritidis outbreaks between 1998 and 2007. A total of 391 single-etiology outbreaks due to *Salmonella* Enteritidis were reported to the CDC. Of these, 132 (34%) outbreaks implicated food items that could be classified into a single commodity, with the top three being eggs (64%), poultry (17%), and fruits-nuts (5%).

Judy Greig conducted a study for exploring historical Canadian foodborne outbreak datasets for human illness attribution between 1976 and 2005. Multiple correspondence analyses showed association between *Clostridium botulinum* and wild meat and between *C. botulinum* and seafood.

Priya Kadam compared the *Campylobacter* prevalence on chickens at processing and retail. In the FoodNet study, 143 of 241 chickens analyzed yielded *Campylobacter* (range 1 to 310 CFU/mL). In the FSIS Young Chicken Baseline study, 65 of 159 chickens yielded *Campylobacter* (range 1 to 3400 CFU/mL). Priya Kadam also presented a statistical approach to assess the efficacy of the PR/HACCP program to prevent contamination of poultry by *Salmonella* in the US. The program had a positive impact on the reduction of *Salmonella* in broilers and turkeys.

Amrita Pathania determined the prevalence of *Salmonella* species on marinated chicken skin. Prevalence of *Salmonella* spp. was significantly reduced ( $P < 0.05$ ) by teriyaki marinade on all levels of inoculums, while no significant effect ( $P > 0.05$ ) was observed for the lemon pepper marinade.

The USDA FSIS routine risk-based *Listeria monocytogenes* (RLm) sampling program results from April 2006 to December 2007 was presented by Kristina Barlow. Of the 9,485 product, environmental and food contact surface samples analyzed, < 2% were positive for *L. monocytogenes*. Environmental samples yielded the highest number of positives.

Joshua Gurtler demonstrated that the proper selection of bacterial strains to be used in inactivation challenge studies is critical by screening thirty strains of *Salmonella* for thermal resistance in commercially-processed liquid whole egg (LWE). Only seven of the thirty strains were considered heat-resistant with  $D_{50}$  values ranging from 1.85 to 2.61 min.

A study comparing the thermal inactivation of *Escherichia coli* O157:H7 in non-intact beef steaks of different thickness cooked by three different methods was presented by Cangliang Shen. Increased steak thickness allowed greater inactivation of *E. coli* O157:H7. Furthermore, roasting in a kitchen oven was most effective for pathogen inactivation.

Arthur Hinton from the USDA-ARS-RRC demonstrated that hard water chemically softened by the addition of 5% w/v potassium citrate was able to reduce the load of *Campylobacter* and Enterobacteriaceae populations on broiler carcasses.

Adrian Parton from MATRIX MicroScience Ltd. described the development and validation of a re-circulating

ITS method linked to a real-time PCR, which allows the same-day detection of *E. coli* O157:H7 from large samplings (10 × 375 g) of fresh or frozen raw ground beef.

Ron Murphy concluded the session by indicating that a cocktail of six *Salmonella* serotypes or six *L. monocytogenes* surface-inoculated onto sausages could be reduced by 3 log each, after treatment with dual electromagnetic irradiation technology.

## T7– Risk Assessment, Spoilage and Beverages and Water

Visvalingam Jeyachandran, University of Manitoba, Canada  
Ch.V. R. Kumar Tammineedi, University of Georgia

Lee-Ann Jaykus delivered the opening talk on risk assessment, spoilage and beverages and water. She presented an “innovative modeling approach for food safety risk-assessment research for the farm-to-fork continuum” with special focus on *Escherichia coli* O157:H7 and romaine lettuce. According to the model, animal access to the farm and irrigation water are found to be significant contributors to contamination of romaine lettuce. Paula Freitas presented her findings on aerosol transfer of *E. coli* from composting and livestock operations. Atsushi Hasegawa talked about risk assessment of *Campylobacter* infection due to poultry meat consumption in Japan using stochastic risk assessment model. The frequency of raw poultry meat consumption was the most influential contributor of *Campylobacter* infection. Fernando Perez-Rodriguez spoke about construction and evaluation of a probabilistic model to assess the risk of *E. coli* O157:H7 cross-contamination of lettuce during processing. Mark Powell presented his finding on analyzing power and error of *Listeria monocytogenes* growth challenge studies. His findings underscored validity of current challenge study designs to provide an F-test with  $\alpha = 0.05$  and power  $\geq 0.8$  to detect a 1 log increase in mean numbers of *L. monocytogenes*. Valerie L. Darcey’s presentation demonstrated how geographic information systems can be used to identify the relationship between foodservice critical health code violations (as indicator to access safe food) and different socioeconomic status. An association of higher rates of violations were observed in areas with lowest poverty rate.

Anna Van Stelten talked about her research defining strain-specific infective doses required for the establishment of a systemic *Listeria monocytogenes* infection. The aim is to develop revised dose response models that mechanistically relate to virulence the results of the research implicate that the distribution of strains with defined virulence characteristics in food (and thus human exposure to these strains) is not uniform. Edyta Margas gave an overview about Novel Q project, a European project which involves 32 parts. The project governs novel processing methods for production and distribution. Important responsibilities of Campden BRI are hygienic design of equipment, hygienic process performance, etc. Potential high pressure processing leakage factors are microorganisms in the external environment, vessel and transmission fluid pipe wall. The conclusion of the presentation is that the microorganisms may resist pressure. G + ve bacteria shows increases loss of cell

viability with increased pressure and survives when in low pressure and attached to surface at higher pressures. Anne Vercammen presented about the inactivation of bacterial spores in tomato sauce by high hydrostatic pressure. Tomato products like sauce prepared by conventional heating will kill all the vegetative cells but heat resistant spores might survive. Non thermal processing maintains quality attributes of the product. High hydrostatic pressure can be used to inactivate spores in tomato products and can also retain the quality attributes. Dike Ukuku introduced new technologies used for the inactivation of microorganisms. He talked about using UV-light and radio frequency electric fields in the processing of apple juice. Study shows that this method is effective in killing the microorganisms. Panagiotis N. Skandamis presented about a study on microbial spoilage of four Greek appetizers. Studies shows the order of the stable products among the four products in which Garlic salad is more stable followed by eggplant, pepper, and fava beans.

### T8 – Pathogens

Gerardo Guzman-Gomez

Rachel McEgan, University of Florida

Xueyan Liu opened the session with her presentation on the antimicrobial effects of sodium hypochlorite or peroxyacetic acid and high power ultrasound (HPU) for the reduction of murine norovirus in Romaine lettuce. She demonstrated that HPU can improve the performance of the chemical sanitizers. Jeremy Adler discussed thermal inactivation of *Escherichia coli* O157:H7 at different depths of panbroiled and roasted non-intact steaks; panbroiling was more uniform, and faster to reach an internal temperature of 60°C than roasting. The different depths had a significant effect on the survival of *E. coli* O157:H7; varying from 0.3 CFU/cm<sup>2</sup> at 0 mm to 2.5 log CFU/cm<sup>2</sup> at 12 mm of inoculation depth. Angela Roberts demonstrated differences in invasion efficiency among *Listeria monocytogenes* outbreak strains and other virulence associated characteristics using qRT-PCR. Here, reduced *inlA* expression, as well as swarming could explain the variation in the ability to invade human cells among outbreak strains. Ji-Yeon Hyeon presented an improved method combining Real-time PCR and cell culture for the detection and quantification of Rotavirus from fresh produce. In her work, the ultrafiltration method was better

than the PEG method, obtaining good results in 12 hours. Paul Ebner, highlighted the importance of phage therapy for reducing lairage-induced increases in *Salmonella* colonization in market weight pigs. He demonstrated reduction of cecal *Salmonella* counts (95%) and ileal counts (90%), using phage therapy. Jiayi Zhang described compared microbiological profiles of beef from conventionally raised and grass-fed cattle. In his work, the profiles were similar for both raising cattle systems.

Jessica Corron then presented work showing *Listeria monocytogenes* epidemic clone strains were able to grow to higher levels when in a turkey matrix held at 7°C, a temperature representative of home refrigeration. Shanna Williams demonstrated the use a combined method of enrichment and PCR for the detection of *Listeria monocytogenes* and its application for the evaluation of employees trained for *L. monocytogenes* control. Bayleyeng Molla Zewde described the association of biocide use with antimicrobial resistance of *Salmonella* recovered from swine barn floors. The increase in proportion of resistant isolates might be associated with efflux systems, caused by quaternary ammonium compound, which is known to influence directly the disruption of the cellular membrane; peroxide did not increase the proportion of resistance isolates. Priya Kadam discussed the decline in *Salmonella* positive samples in six USDA-FSIS regulated product classes, and the new three-category system based on performance. Palmy Jesudhasan explained in his study, the influence of AI-2 autoinducer on global gene expression, mainly *Salmonella* Pathogenicity Island-1 (SPI-1) genes and he concluded that AI-2 autoinducer reduces *Salmonella* Typhimurium virulence and its possible use in *Salmonella* control. Wondwossen Gebreyes ended the session by discussing the prevalence of Methicillin-resistance *Staphylococcus aureus* (MRSA) in pigs and farm workers. He found a low prevalence (1/17) on farm workers, identifying them as potential source of MRSA to pigs. Methicillin-resistance coagulase negative *Staphylococcus* (MRCoNS) had high incidence (22/120) and is a concern because they have been reported as potential sources of Methicillin-resistance genes to susceptible *S. aureus*.

## ROUNDTABLES

### RT1 – Public Health Decision Making — A Character Building Exercise

Hari P. Dwivedi, North Carolina State University  
Sonja T. Jones, Louisiana State University

Michael Brodsky (Past President IAFP) opened the roundtable discussion and moderated the discussion over "Tough Decisions in a Foodborne Outbreak." The guest panelists were Linda Gaul (Texas Dept. of State Health Services); Dennis Easton (ORA/FDA); Barbara Kowalczyk (Center for Foodborne Illness Research and Prevention); Jenny Scott (Grocery Manufacturers Association); Ian Williams (CDS-NCZVED); and Ian Jenson (Meat and Livestock Australia). Each exercise consisted of a scenario related to limited epidemiological and lab findings on foodborne illnesses and outbreaks based on which possible decision path was outlined by the panel. Each scenario was dissected by interactive discussion consisting of questions from the audiences and industrial representative followed by response from regulatory agency representatives on decision making regarding risk assessment, risk management and risk communication during foodborne outbreaks. The significance of communication between the local health departments, public and epidemiologists was discussed in the case of multi-states outbreaks. The limitations of lab diagnostic facilities in local hospitals, microbial detection methods, sampling during traceability studies and shortcoming of the epidemiological and traceability studies during foodborne outbreaks were discussed while mulling over mock scenario of different situations of foodborne outbreaks. Due to time lag between the food consumption and pathogen identification, a greater need of regular and transparent communication between public (parents if children are the case during outbreak) and health departments were discussed. The significance of public warning (at what point/where/how much information going to public) in media implicating a particular food source during early stages of preliminary outbreak investigation was discussed.

After the break, the second panel consisting of: Scott Crerar (New Zealand Food Safety Authority); Sherri McGarry (FDA-CFSAN); Jenny Scott (Grocery Manufacturers Association); and Ian Williams (CDS-NCZVED) recapped "Real Foodborne Outbreaks," specifically *Salmonella* Typhi, associated with peanut butter. The recap discussed the advisory press release of the peanut butter products recall in January 2009 from Kellogg's and peanut butter manufactured by Peanut Corporation of America (PCA) and distributed under King Nut. Initially, the peanut butter paste from PCA results was positive for *Salmonella*, but later retested showed a non-detectable level of *Salmonella*. It was stated that the authorities used the Bioterrorism Act (BT Act) to retrieve records from PCA; which led to an estimated 4,000 products recalled. Why the decision to use the BT Act on PCA was asked. The panelist replied the act evokes records of access for traceability of distribution if there is a potential public threat. The act can be evoked in less than 24 h. Another panelist highlighted that utilization of these

tools "encourage" cooperation with state/federal agencies during inspection. Most importantly, it was pointed out that guaranteed lessons were learned from the *Salmonella*/peanut outbreak. Lastly, Dr. Nega Beru (Director of CFSAN-FDA) was a guest speaker who presented an overview of the current "CFSAN Activities Relating to Regulations." Dr. Beru succinctly discussed the Egg Safety Rule; cGMP modernization; personnel training; SSOPs; HR 2749—Food Safety Enhancement Act Selected Provisions; and 2005 Sanitary Food Transportation Act, a reportable food registry operational on Sept. 8, 2009.

### RT2 – Selling Food Safety to Employees: Creating a Fully Functioning Food Safety Culture in Retail Grocery and Foodservice Operations

Angela Laury, Texas Tech University  
Jeremy Adler, Colorado State University

Todd Rossow, Publix Super Markets, began the session by discussing the importance of selling food safety from the top management down. He utilizes food safety videos and images of foodborne illness victims to emphasize the need for education and training daily to management. He also believes accountability must be included in a food safety program and suggested the use of "Food Safety Score Cards" along with recall, pest control, sanitation and regulatory audits as tools. Ongoing continuous improvement measures are needed for safety throughout the years.

Linda Gilardi, Compass Group North America, followed with explaining how her company utilizes strategic planning and quality assurance manuals to ensure that management is trained. Compass Group has developed a 6-month training guide that is divided into 24 specific topics that take only 5 minutes for the manager to complete. The manager has a new topic each week and requires that to copy; identify specific week topic; highlight; and then coach team members on the topic. There is a reward and incentive plan associated with this training program, which provides employees face to face contact, active participation, and smaller sections to learn for different learning styles.

Peter Hibbard, REHS Darden Restaurants, next explained how technology can work for a company. Advantages of using technology within plants include: traceability; automation; continual monitoring with on demand information; alarms for out of range critical limits; and ease of labeling. While the disadvantages of using technology include: overconfidence; technology stops working; high initial expense; lack of interoperability; need to have manual backup. He suggests not solely using technology in all areas of your process but only when it is appropriate.

Sharon Wood, HEB, began her session by allowing the audience to "Catch the Wave of Food Safety." HEB utilizes several programs such as "Stop and Go" Program, reward & consequences program not based on performance, a voluntary facility self assessment program, food safety pocket guides, color coding for sanitation stations, and a Food Safety Executive Council to aid in assessment of companies progress.

Gina Nicholson, The Kroger Company, spoke on the topic of "Branding your Food Safety Messages", where she emphasized the need for simple, clear, concise, positive,

and clear messages from credible food safety personnel who are able to connect on an emotional level that creates a buy-in attitude and loyalty to employees and customers. Companies must utilize both internal branding and branding partners to strengthen message.

Dr. Ann McNamara, Jack in the Box, concluded the session with a food safety video by employees. Jack in the Box has changed the entire culture of the workforce to focus on food safety in every activity they perform. Their training is 70% on job training, 20% manager role modeling, and 10% computer based classroom training. Employees are taught why food safety is so important through senior management resources and scenario situations.

During the panel discussion questions were asked on employee training, language barriers, allergen concerns, the handling of internal and external audits, where should food safety start in the process, and the importance of answering the "why questions" with food safety.

### **RT3 – Measuring and Interpretation Food-handling Behavior and Its Impact on Policy**

*R.D.C. Senaka Ranadheera, University of Newcastle, Australia  
Pardeepinder Kaur Brar, University of Florida*

This roundtable discussion was organized to discuss food safety education, food hygiene and sanitation, national alliance for food safety and security. Five speakers presented their ideas and findings after the introductory remarks from organizer/convenor Dr. Christine Bruhn. Dr. Randall Phebus from Kansas State University showed his concern towards consumer cooking practices. He presented some findings from a study which designed to investigate cooking practices done by consumers and how well labels are understood using a camera system. One of the interesting findings of this study was that participants did not follow product label instructions because of ambiguous labels which are hard to read. Dr. Ben Chapman from North Carolina State University provided some background on how the food preparer

handles food affects the likelihood of foodborne illness under the topic of what happens in the food service kitchen? His findings based on video observations also revealed that poor hand hygiene is one of the most prevalent mistakes that leads to gross contamination. However, mostly it is indirect cross-contamination and food handlers do not directly cross-contaminate foods. Furthermore, he explained that there is high risk of contamination during busy times. Third presenter for this session, Dr. Amy Simone from University of Florida delivered a lecture on special challenges in Asian and Hispanic restaurants. According to her ethnic foods are foods prepared by different ethnic cultures. She emphasized that CDC reported 3–11% increase in outbreaks from 1990–2006. Mexican foods demonstrated highest number of outbreaks per year compared to Asian or other ethnic foods. Dr. Lidia Medeiros from the Ohio State University presented the wide range of information on motivating consumers to practice safe food handling. She explained how to construct a mental model to motivate consumers to practice safe food handling in details. Robert E. Brackett, senior vice president and chief science and regulatory officer from Grocery Manufacturers Association, Washington, D.C. put some light on the history of seven major outbreaks and how they have led to change in policies. Seven outbreaks include Bon Vivant Vichyssoise (1971), Jack in the Box (1993), unpasteurized fruit juice including *Salmonella* in orange juice (1995) and *E. coli* O157:H7 in apple juice (1996), luncheon meats and franks (1998), raw bagged spinach (2006), tomato/jalapeño pepper (2008), and peanut products (2009). He showed that these outbreaks lead to drastic changes in legislative and industry policies and the recent outbreaks have changed policies even more drastically. The take-home message after the discussion was to work better with multiple organizations, deliveries like chefs, contemporary culinary audience, science teachers, etc. Scientists need to be focused on risk communication as well.



# Highlights of the Executive Board Meeting

## July 10-16, 2009

### Grapevine, Texas

Following is an unofficial summary of actions from the Executive Board Meeting held in Grapevine, Texas on July 10-16, 2009:

#### Approved the following:

- Minutes of April 21–22, 2009 Executive Board Meeting
- Budget for fiscal year ending August 31, 2010
- Frozen Food Foundation Research Award
- Colombian Association of Food Science and Technology as an IAFP Affiliate

#### Discussed the following:

- E-mail votes taken since the last meeting
- Constitutional Amendment
- Committee appointments
- Committee recommendations
- Review of board schedule
- IAFP 2009 review
- Parkin and Silliker Lecturers
- International meeting updates – Berlin, China, Korea and Dubai
- Dates for 2010 European Symposium
- Location for 2010 International Symposium
- Changes for *FPT*
- Minor revision to the Policy on Document Retention and Destruction
- World secure food chain proposal of cosponsorship
- Information dissemination
- Report on APHA Compendium of Methods – update

- WHO-NGO update
- 3-A Sanitary Standards
- Non O157 *E. coli* white paper
- 100 year anniversary
- Annual Meeting future planning
- Webcasting
- Investment results for 2008
- India activity – establish Affiliate
- Rapid Response for *Salmonella* in peanut products
- Newly designed Membership materials

#### Reports received:

- *IAFP Report*
- *Food Protection Trends*
- *Journal of Food Protection*
- IAFP Web site
- Membership update
- Advertising/sponsorship update
- Financial statements
- Board Members attending Affiliate meetings
- *Affiliate View* newsletter
- Future Annual Meeting schedule
- Exhibiting (IAFP On the Road)

**Next Executive Board meeting – October 22–23, 2009.**

# MINUTES OF THE INTERNATIONAL ASSOCIATION FOR FOOD PROTECTION 2009 ANNUAL BUSINESS MEETING

President-Elect Vickie Lewandowski welcomed attendees to the Annual Business Meeting.

## Moment of Silence

President Stan Bailey asked those present to observe a moment of silence in memory of departed colleagues.

## Call to Order

The Annual Business Meeting of the International Association for Food Protection was called to order at 12:21 p.m. at the Gaylord Texan Resort in Grapevine, Texas. A quorum was present as defined by the IAFP Constitution.

With the approval of the Executive Board, President Bailey appointed Michael Brodsky as Parliamentarian for the Business Meeting.

## Minutes

Minutes from the 2008 Annual Business Meeting which were published in the November 2008 issue of *Food Protection Trends* were approved after a motion from Bob Sanders and a second from Gary Acuff.

## President's Report

President Bailey reported programs and activities of IAFP over the past year. He reported IAFP is in good shape despite the losses to investments due to the global economic downturn, the new Web site was launched with positive feedback, new program materials were developed and are in use, and that IAFP will have close to 3,500 Members by the end of July. International membership (outside North America) has grown to 13% which is up over the last year.

President Bailey reported that Annual Meeting attendance is projected to be close to last year's attendance numbers although the final tally will not be available until after the meeting. He noted this is a very good sign when compared to other group's meeting attendance during these hard economic times. He emphasized that overall the organization is very healthy and strong due to high participation from members. He commended David Tharp and the entire IAFP staff for all their hard work at the meeting and throughout the year.

President Bailey presented five Presidential Recognition Awards. The first was to Fred Reimers for his excellent work with the Local Arrangements Committee.

Fred recruited over 80 volunteers to assist with this year's meeting. The next award was presented to Randy Dags for all of his work in food safety and his support of the organization over many years. The final three awards were presented to IAFP staff members Tamara Ford, Leilani McDonald and Trinette Worthington for their efforts on behalf of the organization.

## Tellers Committee Report

Larry Cohen, Teller, reported there were 692 ballots cast, down slightly from last year. Katherine M.J. Swanson was elected as Secretary for the 2009-2010 year. A motion by Paul Hall and seconded by Kathy Glass to accept the report and destroy the ballots was approved.

Stan Bailey congratulated Katie on her success and thanked Mark Moorman for standing for election.

## JFP Management Committee Report

Scientific Editor Joseph Frank provided the report on behalf of Chairperson Mark Harrison. He indicated recommendations were made to reappoint himself for another four-year term as Scientific Editor, allow open access to articles 6 months after their publication in *JFP*, appoint a subcommittee to survey members on their attitudes about modifying subscription rates, page charges, and studying the feasibility of making *JFP* completely online while investigating the feasibility of distributing accepted *JFP* papers and/or the monthly table of contents to all IAFP members. Joe also indicated a policy on plagiarism previously reviewed by the committee will be circulated again so it can be incorporated into the Instructions for Authors. The Instructions for Authors will be modified to address deposition of microarray data and gene sequences into appropriate database catalogs and will include accession numbers in the materials and methods of submitted manuscripts. Authors will be encouraged to make available and share microorganisms in their studies to requesting parties.

## FPT Management Committee Report

Michelle Danyluk provided the report on behalf of Chairperson Julian Cox. She reported manuscript submissions had increased from 13 to 20, she had been elected as Vice Chair, and a subcommittee was formed to develop a member survey pertaining to a revitalization of *FPT*. In addition, recommendations were made to the

Executive Board to appoint a part-time managing editor to provide support for the *FPT* renovation and to approve modifying the *FPT* Instructions for Authors regarding plagiarism based on changes implemented by the *JFP* Management Committee.

#### Foundation Report

Gale Prince reported that the past year has brought the fund many challenges with the downturn on investment returns. The fund balance as of May 2009 was \$650,000. He indicated he was very encouraged by the many individual contributions that had been made over the past year and that he would again be writing a matching contribution check that will also include a \$250 stimulus check he had received from the government. Gale reminded everyone to participate in the silent auction – and to bid high on the items offered. He encouraged everyone to think about corporate foundations as a way to help build a stronger IAFP and also challenged Affiliate organizations to compete against each other in making their contributions to the Foundation. Upon conclusion of his report, the Florida Association for Food Protection asked to be recognized and then presented an animated tale that was completed with a \$1,000 contribution to the Foundation Fund.

#### Affiliate Council Report

Chairperson Roger Cook thanked everyone for their support throughout the year following his skiing accident. He announced new affiliate organizations were chartered from Arkansas, Colombia and Hungary; a new postcard-size advertisement is available to encourage affiliate participation; there were 35 affiliate reports received which reflected excellent preparation and concise reporting; and he announced and acknowledged the 2009 Affiliate Award finalists as well as the winners. He ended with a special thank you to Lani McDonald for her exceptional work with Affiliate Council administration and production of the Affiliate View, as well as her “rock solid” support through a trying year. The recommendations made to the Executive Board included providing Affiliate Networking rooms at future meetings, establish a “FAQ” section on the Affiliate Web page of the IAFP Web site, and to acknowledge David Lloyd, Affiliate Delegate from the UKAFP, as incoming Secretary of the Affiliate Council. He offered a special thanks to incoming Affiliate Council Chair Dan Erickson who had covered for him at the Executive Board meetings during his recovery.

#### Executive Director's Report

David Tharp reported the Association has been very active and productive this year. The European Symposium in Lisbon, Portugal was financially successful and very well attended. Planning continues for the next European Symposium to be held this coming October in Berlin, Germany. Beyond Europe, a Latin American meeting was held in São Paulo, Brazil and the next International Symposium will be held in Seoul, Korea in November. The Association has also contributed to food safety meetings in Dubai and Beijing, China. He noted the Association's financial stability is in excellent shape even after undertaking expense for software upgrades, the design and introduction of a new Web site and the production of the new membership materials. In spite of the investment losses, David reported that for the budget items we could control, we did very well this year. David thanked the IAFP Staff for their efforts specifically with Annual Meeting and also throughout the year.

#### Unfinished Business

There was no unfinished business.

#### New Business

Proposed changes to the Article IV of the IAFP Constitution, as made available through the *IAFP Report* and published in the June 2009 issue of *Food Protection Trends*, were presented. Changes were proposed to allow dedicated Executive Board members to continue serving on the Board after a change in employment. A motion to accept the proposed changes was made by Gale Prince and seconded by Kathleen Rajkowski.

Discussion began when Randy Daggs proposed a friendly amendment to change “categories of membership” to “professional affiliation”. Discussion followed. A motion to replace the phrase “categories of membership” with “professional affiliation” was made by Roger Cook, seconded by Fred Weber and was approved.

President Bailey then requested a vote on the revised amendment and the membership voted to approve.

#### Adjournment

The meeting was adjourned at 1:13 p.m. by President Stan Bailey.

Respectively Submitted,

Isabel Walls, Secretary

# COMMITTEE MINUTES

## STANDING COMMITTEES

### Food Protection Trends Management Committee

**Members Present:** Julian Cox (Chairperson), Michelle Danyluk (Vice Chairperson), David Golden (Scientific Editor), Mark Harrison (JFP Chairperson), Lee-Ann Jaykus (Board Liaison), Gary Acuff, Kristina Barlow, Richelle Beverly, Benjamin Chapman, Beth Ann Crozier-Dodson, Denise Eblen, Timothy Gutzmann, Montserrat Hernandez Iturriaga, Michael Musgrove, Kathleen Rajkowski, Patricia Rule and Peter Taormina.

**Outgoing Members:** Jinru Chen, LeeAnne Jackson and Maria Nazarowec-White.

**Board and Staff Present:** Stan Bailey, Vickie Lewandowski, Katie Swanson, David Tharp and Lisa Hovey.

**Visitors/Guests Present:** Stan Bailey, Larry Beuchat, Mark Carter, Kathy Glass, Dale Grinstead, Vickie Lewandowski, Susan McKnight, Amarat Simmone, John Sofos and Katie Swanson.

**Meeting Called to Order:** 2:05 p.m., Sunday, July 12, 2009.

**Introductory Items of Business:** Julian Cox welcomed everyone to the meeting and all persons in attendance at the commencement of the meeting introduced themselves, their affiliation, and their role on the committee. Thanks were given to those leaving the committee and new members of the committee were welcomed.

**Selection of a Vice Chairperson:** A call was made from the Chair for nominations for this position. Only one nomination was forthcoming, leaving Michelle Danyluk elected unopposed.

**Recording Secretary of Minutes:** Richelle Beverly and Julian Cox.

**Additions/Modifications to the Agenda and Approval:** Julian Cox added an item under "Matters from the JFP Management Committee". The Agenda was then approved by the Committee.

**Minutes from the 2008 Committee Meeting:** The 2008 Minutes were approved by the Committee without amendment or correction.

**Executive Board Report:** Stan Bailey delivered this report.

- IAFP continues to develop its international activities. The 4th European Symposium, in Lisbon, Portugal, was very well attended, with the 5th European Symposium scheduled for October in Berlin. Beyond Europe, a Latin American meeting has been held in São Paulo, Brazil and the next meeting will be held in Seoul, Korea in November. IAFP has also contributed to food safety meetings in Dubai and Beijing, China.
- Membership is currently around 3,500, with international membership continuing to grow, from approximately 8% to 13%. Growth in membership is considered due, at least in part, to the restructuring of membership fees.
- JFP is performing well, though there has been some drop in submission rates. Open Access is to be brought in and on-line access to the Table of Contents will be expanded.
- IAFP Web site renovation is complete, with much positive feedback.

- Three new affiliates have been approved – Arkansas, Colombia and Hungary.
- IAFP has partnered with Springer to form IAFP Press. This will provide for greater accessibility to IAFP publications and a 25% discount to IAFP Press publications for members.
- The Foundation has been impacted negatively by the global economic downturn, and may not reach its goal of \$1 million by 2010.
- Annual Meeting registration may reach 1,900.
- Short meetings such as the Timely Topics and Rapid Response symposia have been well received and attended and highlight the responsiveness of the Association to hot topics.

**Executive Director Report:** This was delivered by David Tharp.

- David indicated that most issues he was to have raised were covered by Stan Bailey.
- Donna Bahun was injured today and is unable to attend this meeting.
- The Association budget has, like the Foundation, been impacted negatively by the global economic downturn. While the IAFP operating budget is on-track, loss through investments is likely to see a \$90,000 loss for the current fiscal year.

**Scientific Editor Report:** This was delivered by David Golden.

Against the decrease in submissions during the previous year, submissions for the current year were quite healthy and *FPT* is likely to meet its target of publishing 2 articles per issue. David provided a breakdown of demographics of authorship and indicated the nature of articles submitted. Some laboratory-based research articles continue to flow in, though the majority continues to relate to food personnel and consumer behaviors and public perceptions of food safety issues.

### Old Business:

The status of 2008 recommendations to the Executive Board was discussed, led by David Golden.

1. Advertise *FPT* in Affiliate newsletters to increase submission of applied journal articles and increase Affiliate involvement. It was clear from discussions at various PDG meetings that engagement with *FPT* was needed.
2. Appoint a subcommittee to develop a plan to continually recruit manuscripts. The membership is LeeAnne Jackson (Chair), George Baker and Patricia Rule. A report appears below.
3. Instructions to Authors have been reviewed and revised. Executive approval is needed to publish these Instructions. Approval has been given and these are being published, though further amendments are necessary (see below).
4. Eliminate the position of Scientific News Editor, and thus the Science News section of the Journal. This has been done, though the status of the section may need to be reviewed as part of the follow-up of the *FPT* Analysis, below.
5. Rapidly move towards an electronic version of *FPT*. A click-through version of *FPT* is now available to members

across the web, though the document is downloadable only in its complete form; individual articles cannot be printed or downloaded. The IAFP staff will look into changing the format to enable this functionality.

**Subcommittee report.** This was provided by LeeAnne Jackson. A subcommittee had been formed to develop a plan to recruit manuscripts. Due to personal and professional circumstances, LeeAnne had not been able to drive this process. However, David Golden indicated that he had been able to solicit papers based on poster presentations at the previous Annual Meeting.

#### **New Business:**

**FPT Analysis Report.** Discussion of this item was led from the Chair.

It is clear that *FPT* continues to suffer from an 'identity crisis' and concerns continue with respect to the number of submissions of articles. Extensive discussion, based on a report from a consultant with extensive editorial experience in member and trade publications, revolved around the structure and format of *FPT*, particularly with respect to the nature and mix of articles submitted and published. It was agreed that change is necessary, though the committee was not in a position to recommend the nature and extent of those changes. There was consensus that more review articles should be published, drawn particularly from reviews prepared by graduate students, developed from posters, and from presentations given at the international meetings involving IAFP. Collectively, these were viewed as conduits for communication of activities that might not otherwise be seen by the membership-at-large. It was agreed that the Committee support the Board in considering the potential changes advocated in the consultant's report. Further, the management meeting should form a subcommittee to develop a survey, to be administered online, to gather the thoughts of the membership-at-large on renovation of *FPT*. After a call for nominations, the members of the committee were Julian Cox (Chair), Kristina Barlow, Richelle Beverly, Benjamin Chapman, Beth Ann Crozier-Dodson, Michelle Danyluk, and Michael Musgrove. The Management Committee also agreed that the Board should consider employing a part-time 'managing editor', to implement changes deriving from the survey of the membership, and to assist in recruitment and preparation of articles for publication in *FPT*.

**Plagiarism.** Julian Cox reported that discussion at the *JFP* Management Committee meeting highlighted a number of changes to be made to Instructions to Authors. Of those, the only change relevant to *FPT* related to plagiarism. The *JFP* Management Committee is to prepare an amendment to the *JFP* Instructions, including a clear explanation of plagiarism and penalties to be imposed upon authors found guilty of plagiarism.

#### **Recommendations to the Executive Board**

1. Appoint a subcommittee to develop a survey determining directions for *FPT*, for distribution to the IAFP membership. Members of the Subcommittee are Julian Cox (Chair), Kristina Barlow, Rochelle Beverly, Benjamin Chapman, Beth Ann Crozier-Dodson, Michelle Danyluk and Michael Musgrove.
2. Appoint a part-time 'managing editor' to provide support for renovation of *FPT* and to drive provision of a range of articles, assisting with their preparation, for publication in *FPT*.
3. Modify the Instructions to Authors for *FPT* to make explicit the nature of plagiarism and penalties for cases of plagiarism, consistent with such modifications made to the Instructions for *JFP*.
4. Michelle Danyluk was elected as Vice Chairperson of the Committee.

**Next Meeting Date:** August 1, 2010.

**Meeting Adjourned:** 3:50 p.m.

**Chairperson:** Julian Cox.

### **Journal of Food Protection Management Committee**

**Members Present:** Mark Harrison (Chair), Margaret Hardin (Vice Chair), Julian Cox (*FPT* Chairperson), John Bassett, Byron Brehm-Stecher, Michael Cassidy, Tong-Jen Fu, Santos Garcia, Leon Gorris, Kendra Nightingale, Mangesh Palekar and Manan Sharma.

**Editors Present:** Michael Davidson, Joseph Frank, Elliot Ryser and John Sofos.

**Board and Staff Present:** Stan Bailey, Vickie Lewandowski, Lee-Ann Jaykus, David Tharp, Tamara Ford and Didi Loynachan.

**Visitors/Guests Present:** Jinru Chen, Gary Dykes, Judy Greig and Joseph Odumeru.

**Meeting Called to Order:** 10:05 a.m., Saturday, July 12, 2009.

**Recording Secretary of Minutes:** Manan Sharma.

**Old Business:** The agenda was reviewed and approved. The minutes of the 2008 meeting were reviewed and approved.

**Report from IAFP President:** The recent focus on international activities (outside the US) has increased. In 2008, the 4th Annual European Symposium was held in Lisbon Portugal. Other international meetings were held in São Paulo, Brazil and Seoul, South Korea (IAFP-sponsored). Other meetings IAFP was affiliated with took place in Dubai, UAE (1,000 attendees) and Beijing, China (250 attendees). One "timely topics" seminar was held on raw milk (Washington, D.C.), and another Rapid Response symposium was held on *Salmonella* in peanut butter in Washington, D.C. Currently, 13% of IAFP members reside outside the US, and total membership is approaching 3,500. There are 101 Sustaining members, 15 Gold, and 11 Silver. Three new affiliates have been introduced: Colombia, Hungary, and Arkansas. The IAFP Foundation currently has close to \$650,000 in its account. The Student Luncheon is in its 10th year; the Job Fair in its 9th year. A new agreement has been reached with Springer, Inc. to publish the Food Microbiology/ Food Safety series of books under "IAFP Press". IAFP members will get a 25% discount on books in this series.

**Report from IAFP Office:** David Tharp thanked the four editors and the committee members. IAFP operated within budget this year. IAFP's Web site and software were upgraded. In addition, abstracts for the annual meeting presentations were distributed on thumbdrives with meeting registration materials.

**Report from the Journal of Food Protection Scientific Editors:** (The complete report for Vol 71 can be found in the January issue of the *JFP*.) Briefly, Vol. 71 of *JFP* contained 2,636 pages and 369 articles (356 research papers), compared to 2,983 pages and 404 articles in Vol. 70. So far, Vol. 72 (2009) contains 1,592 pages and 194 papers, compared to 1,540 pages and 246 papers in Vol. 71. So far 39 fewer manuscripts have been submitted in 2009 than in 2008. The journal had excellent international (outside the US) contributions, with 56.3% of authors in Vol. 71 from outside the US. The editorial board in 2008 consisted of 150 members. Individuals interested in becoming a reviewer should submit a letter to the editors to show their interest. A discussion ensued concerning the rejection rate of the journal. Dr. Frank stated that the rejection rate has been consistent over the last 10 years. Although page

charges are considered expensive, it was agreed that publishing in *JFP* gives higher visibility to authors' work. Stan Bailey stated that considerable revenue would need to be accounted for if page charges were eliminated. This issue will continue to be monitored.

**New Business:** A motion for the Executive Board to reappoint Joseph Frank as scientific editor for another four-year term was approved.

There was a lengthy discussion about impact factors and online access to *Journal of Food Protection*. This subject was brought up in response to the fact that the impact factor of the journal has decreased in the Biotechnology/Applied Microbiology category. LeeAnn Jaykus inquired if *JFP* was batched with other journal when libraries and institutions to subscribe to them. Currently it is not. The editors mentioned that the impact factor of the journal had decreased because of the large number of submissions they receive. The impact factor could be increased if the journal published less papers but contained more review papers. However, strengthening the impact factor may not fulfill the mission of the journal, which is to provide information to wide variety of professionals. Some of these individuals may use the information for industrial or regulatory purposes but may not cite it in formal publications that are used to calculate impact factors (because they are not publishing original research). *JFP* does not fit into a specific category (completely microbiology, biotechnology, etc.), so the category impact factors that are used may not be appropriate for ranking the true impact of the journal.

Leon Gorris and Kendra Nightingale summarized the subcommittee report on open access to *JFP* (Kathryn Boor was also on the committee). NIH requires that publications resulting from NIH-funded work must be openly accessible within 12 months. This may cause authors to choose not to submit work to *JFP* because its current limited access (subscription only), would prevent readers from seeing a full study and relying on the abstract only to interpret findings. Other journals provide open access 12 months or sooner; however, *JFP* will incur significant costs in making this transition. The report from the subcommittee was presented to the IAFFP Executive Board earlier this year. The Board approved the concept and that IAFFP would cover the costs to make *JFP* articles available through PubMed and Ingenta (current online publisher). The Management Committee suggested that 6 months should be time after an article is published in *JFP* to make it open access.

There was also a discussion about making accepted, but not published papers, available online. It was thought that this might help increase the impact factors by providing more access to articles. The issue of open access was again addressed, with some wondering if using an 'open access' model would decrease the incentive to become a member of IAFFP and subscribe to *JFP*. Leon Gorris suggested that pre-publication of papers may increase the number of papers received by *JFP* and may actually encourage more authors to submit. However, the question of accepting a publication but not receiving payment for the page charges was raised.

Several people brought up the issue of what would make *JFP* go completely online in the coming years. There were 141 less members (611) and 65 less institutional subscribers (598) receiving the hard copy of the journal last year, but there were 100 more online subscribers in 2009. It was also suggested that money that is currently spent to print hard copies of the journal could be used to support pre-publication and open access.

It was brought up that the table of contents of each month's issue could be sent to IAFFP members with a direct link to the article (similar to other journals). A subscriber would have direct access to the article, but non-subscribers would view only the abstract.

The policy on plagiarism was discussed because of several situations the editors dealt with this year. It was decided that this

policy should be re-circulated among the Committee for comment before being incorporated into the Instruction for Authors in fall 2009. This is a matter that possibly will increase with more online material available. A discussion about the copyright of downloaded PDF files of journal articles concluded that the distribution of these files should be limited and for educational purposes.

The submission of microarray data, gene sequence data, and strains of microorganisms used in studies was discussed. The raw data from microarray studies and gene sequences should be deposited in the appropriate database, and guidance to authors to state this in the Materials and Methods section of papers will be issued. A checkbox on the submission form or added language to the instructions to authors will be used. Also, authors will be strongly encouraged to make strains available to other investigators.

A sub-committee was appointed (pending Executive Board approval) to examine membership attitudes about modifying subscription rates, page charges, and feasibility of making *JFP* completely online. This sub-committee, if approved, will consist of Mark Harrison, Kendra Nightingale and John Bassett.

#### Recommendations to Executive Board:

1. Reappoint Joseph Frank as Scientific Editor for another four-year term.
2. In implementing the "open access" policy recently approved by the Board, the Committee recommends that access be allowed 6 months after publication in *Journal of Food Protection*.
3. Appoint a subcommittee to survey members on their attitudes about modifying subscription rates, page charges, and feasibility of making *JFP* completely online. The sub-committee will consist of Mark Harrison, Kendra Nightingale and John Bassett.
4. The feasibility of distributing papers accepted for publication in *JFP* and/or the monthly table of contents to all IAFFP members (not just subscribers) should be investigated. If feasible, then it is recommended the Board approve this recommendation for implementation.

#### Information Items to the Board:

1. The policy on plagiarism reviewed by the Committee in spring 2009 will be circulated again to the Committee so by early fall 2009 it can be incorporated into the Instructions to Authors.
2. Instructions to authors will be modified to address the following issues: a) deposition of microarray data and gene sequences into appropriate database catalogs, and to include accession numbers in the materials and methods of submitted manuscripts, b) authors will be encouraged to make available and share microorganisms in their studies to requesting parties.

**Next Meeting Date:** August 1, 2010.

**Meeting Adjourned:** 12:05 p.m.

**Chairperson:** Mark Harrison.

## SPECIAL COMMITTEES

### 3-A Committee on Sanitary Procedures

**Members Present:** Ron Schmidt, Steve Sims and Philip Wolff

**Visitors/Guests Present:** Zhinong Yan, John Bruhn, Bob Sanders, Dennis Gaalswyk, Allen Sayler and Dan Erickson.

**Meeting Called to Order:** 10:03 a.m., Sunday, July 12, 2009.

**Recording Secretary of Minutes:** Philip Wolff.

**Old Business:** No old business.

**New Business:** Bob Sanders asked what 3-A SSI was doing to promote the use of the 3-A Sanitary Standards and 3-A Accepted Practices. As a former member of the 3-A Symbol Council, he would like to know if advertisements were being placed in national magazines that would be read by people who may not be aware of the 3-A program. Discussion on how the symbol was being promoted followed. We did note a press release in *Food Protection Trends* and monetary assistance provided to members of CSP so they could attend the 2009 May Meeting in Milwaukee. Suggestions were made to reproduce and update articles like "What is 3-A" for national publications like *Food Protection Trends*, *Food Quality* and *Food Safety* magazines.

There was also a suggestion that *Food Protection Trends* should provide notification when a 3-A Sanitary Standard or Accepted Practice was newly issued or revised. The title, scope, effective date, and a method of obtaining the revision should be included in the notification.

CSP would also like to see a section or area of the 3-A SSI web page that contained a data base of upcoming votes, the due date, a summary of the action, and a list of people eligible in each stake holders group. The data base should be able to track the votes in real time so that reminders could be sent to members as the due date approached.

The rest of the meeting we discussed symposium and workshops for next year's Annual Meeting. Suggestions included:

#### Symposium

- International Food Equipment Sanitary Standards: Effective, Competitive or Conflicting.  
This could include representatives from 3-A, EHEDG, FDA, USDA, GMA, NSF, AMI, the National Restaurant Assoc., etc.

#### Workshops

- Mechanics and Accrediting of Automated Cleaning Systems.  
This could include section of farm equipment, juice equipment, hard to clean equipment, equipment used for I.V. fluids, records, and allergens.

#### Recommendations to Executive Board:

1. Follow-up on promotion activities undertaken by 3-A SSI.
2. Consider printing a summary of new or revised 3-A Sanitary Standards and 3-A Accepted Practices. The title, scope, effective date, and a method of obtaining the revision should be included in the notification.
3. Investigate the possibility of a data base for 3-A that could be used assessed by members of the Working Groups only and that could track upcoming ballots and eligible voters in real time.

**Next Meeting Date:** Milwaukee, May 2010.

**Meeting Adjourned:** 11:50 a.m.

**Acting Chairperson:** Philip Wolff for Don Wilding.

#### Audiovisual Library Committee

**Members Present:** Bennett Armstrong, Dorothy Wrigley, Bob Sanders and Judy Harrison.

**Board and Staff Present:** Vickie Lewandowski and Leilani McDonald.

**Meeting Called to Order:** 1:00 p.m., Sunday, July 12, 2009.

**Recording Secretary of Minutes:** Judy Harrison.

**Old Business:** The committee reviewed usage from last year. A total of 353 check-outs were completed this year. Usage is still going down. We reviewed the 2008 agenda and incorporated the unfinished items into this year's agenda.

**New Business:** To bolster the declining trend of usage, we should search for DVDs on timely topics. These would include viruses, produce safety, GAPs, GMPs, HACCP, raw milk, nut safety, allergens, recalls and traceback, SOPs, and cleaning and sanitizing. To expand the resources on Web site, look at how IAFF could subscribe to online databases in food safety that sustaining member companies could maybe fund.

#### Recommendations to Executive Board:

1. To partner with IFT, NEHA, ASM, etc. to acquire DVDs for member usage.
2. To look at putting DVDs and international meetings and symposia on flash drives to send out to members through the library.
3. Have a contest for membership to submit material to AV Library. Give a prize of \$100 for each item accepted for inclusion in the library.
4. Compare shipping charges for Post Office, UPS, and FED EX to see which is most cost effective for sending out materials.
5. Make the order form more readable and user friendly.
6. Check on site licenses. Do we have a site license for the training materials purchased for the library?
7. Review criteria for acceptance into the AV Library.
8. To consider access to public health databases for members.
9. Does our Web site have the capacity to host webinars, podcast, etc.?
10. Question for the Board. Can library borrow money from Membership Committee to upgrade library and advertise it as a member benefit?

**Next Meeting Date:** IAFF 2010, Anaheim, California.

**Meeting Adjourned:** 3:00 p.m.

**Chairperson:** Bennett Armstrong.

#### Committee for Control of Foodborne Illness

**Members Present:** Ewen Todd (Chair), Judy Greig (Vice Chair), Gary Acuff (Board Liaison), Kristina Barlow, Moshe Dreyfuss, Christopher Griffith, Jack Guzewish, Marilyn Lee, Sharry McGarry, Maria Nazarowec-White, Gale Prince, Juliana Ruzante and Agnes Tan.

**New Members:** Guodong Zhang, Andrew Maccabe, Brian Sheldon, Pat Curtis, Fritz Lembke, Tom Schwarz, Amanda Tian, Christina Tirado, David Baker, Rajesh Nayak, Bennett Armstrong and Michael Cassidy.

**Meeting Called to Order:** 8:10 a.m., Sunday, July 12, 2009.

**Recording Secretary of Minutes:** Judy Greig.

#### Old Business:

1. **Procedures to Investigate Foodborne Illness:** Springer Publishing already has the body of the text – work on the keys almost completed. The new edition will be the 6th. Kristin Delea from the CDC has contributed as well.
2. **Diseases Transmitted by Foods:** This CDC document is very dated – 1982 last edition. An Access database version was suggested and could even be developed for

a Ph.D. student possibly with the help of a grant. Funds could be given for this from grants like CSREES.

3. **Foodworker Papers:** Work continues on three more: #7 – Barriers to Reduce Contamination of Food by Workers, #8 – Soaps and Sanitizers Used to Reduce Hand Contamination and #9 – Hand Hygiene and Its Effectiveness in Reducing Pathogen Contamination. Contributions from CCFRA (Chipping Campden) through Debra Brown and John Holah. Comment from Tom Swartz concerning the value of the papers for his clients. Ewen has been approached for a European paper summarizing the complete set of worker papers. When the final paper, e.g., paper 9, is typeset for JFP, IAFF will have the complete set bound and available through IAFF for sale.
4. Frank Bryan completed a history of this Committee in 1999 (believed to have started in 1914). Frank requested that the Committee add to this for a 100 year history in 2014.
5. All the symposia submitted by the Committee were reviewed for this year's conference, as well as poster presentations and talks given by members. Members were encouraged to attend.
6. The submission process for new symposia was changed for 2010. We need to submit them in complete form electronically by October. We will have a conference call to discuss these submission ideas in August and e-mail communications about instructions and final drafts for the Committee to review.

#### New Business:

##### Ideas for Other Publications from the Committee:

- Presentation: How to respond to a foodborne disease crisis. Coordinate with Brian Sheldon, Executive Director of the National Alliance for Food Safety and Security (NAFSS), an alliance of 21 universities with 100 plus scientists for research in food safety and defense. There are a number of manual or guidelines on how to communicate risk during a crisis – number of templates available – collect info and data into a manual to assist a company during a crisis. However, these are specific to the companies involved. There is a manual that is 4 years old from the Association of Food and Drug Officials with Joe Corby who can be contacted at his booth. Also Grocery Manufacturers Association has an industry approach that could be accessed. Pat Curtis, outgoing Chair of the NAFSS Board will follow up with a conference call after input from IAFF Board.

##### Ideas for New Symposia for 2010:

- Ethnic foods that pose a food safety risk: sausages, cheeses, spicy foods (black pepper, spices, mixed ingredient foods – epi challenges).
- Developing counties – ex. *B. cereus* deaths – Australia had a massive outbreak in a Mosque – rice dish. Also two deaths in Dubai from eating rice.
- Zoonotic risks to food handlers/slaughter-house workers/farm families and workers – e.g., Hepatitis E, Hepatitis A, *E. coli*.
- Joint symposium on norovirus at retail. It is a broad industry and presents special problems when controlling an outbreak. Viral and Parasitic PDG could contribute and also material from the Food Handler papers could be used. Cruise ship industry may have practices that others could learn from. Excellent work on prevention/control

of norovirus for the winter Olympics in British Columbia. Need for effective communication. Special considerations: elder care facilities, restaurant hotel/sporting events/ and cruise ships. Consider food handler bringing it in or visitor. Is the profile of norovirus outbreaks changing? Retail group is planning a similar topic. Thailand's military has done some norovirus work. A roundtable format would work well and we could involve other PDGs.

- Listeriosis at retail – international perspective. Codex has provided guidance and inter-esting to see how different countries are implementing this – harmonization of regulations internationally. Consider how retail handles this issue for deli meat – practical aspects. Maple Leaf could be an example of a response to an outbreak.
- Repeat the Public Health decision-making exercise for next year.
- Talks based on the 9 food worker papers.
- Detecting outbreaks earlier, identifying sporadic cases and new approaches to respond.
  - Novel methods for investigating foodborne outbreaks including syndromic surveillance, advancement of molecular epi.
  - Investigations do not always follow a linear approach (e.g., peanut butter).
  - Changing the culture in industry and government. Regulatory action may have to take place before we have an implicated vehicle.
  - Innovation at the local level – real drivers. Is there an outbreak response working group?
  - What is the experience on other continents? UK? OZFoodNet – active surveillance and its use in early epidemiological investigation.
  - CIFOR has industry workgroup. Feedback from industry members who attend this meeting stating they need an explanation of epidemiological statistical association (industry used to testing not epi). Case stories showing process or epi 101 for industry. Ian Williams suggested speaker. Andrew MacCabe suggests we start with this topic – Epi for CEOs and attorneys.
  - Sherri – fundamentals followed by novel approaches.
  - Sherri – Novel approaches can cover epi, food, and industry.
  - Cristina – Sounds like this might be a good training course.
  - Jack – a roundtable might best meet the need more.
  - PDG member suggested including the legal aspects of epidemiology.
  - Agnes – Risk analysis is considering epi and when to communicate risk.

PDG member suggestion: Explore *Listeria* in Europe, special diseases for pregnant woman not food related; need to get together with different groups since there's misinformation – could be related to infant formula, urban legends, maybe not next year. Risk communication group?

##### Additional topics:

1. Attribution and recall – Canada, CDC maybe? How to speed up recalls? GMA, FMI, getting message out/ getting of the market: manufacture to retail then retail to consumers.
2. Migrant food miles – immigrant food handlers.

All new participants were actively involved with the discussion.



**Attendance at CCFI Activities at IAFF 2009 Annual Meeting.** RT1 – Public health decision-making – a character-building exercise, Part 1, 75; Part 2, 46; 58 – Climate Change, 83; 59 – Tracking and Tracing, 113; and P-2-74 – Barriers to contamination by food workers, 65 enquiries, many actively using the food worker papers for training.

**Recommendations to Executive Board:**

1. *Procedures to Investigate Foodborne Illness* to be completed by December 31, 2009.
2. *CDC Diseases Transmitted by Foods* will be revised and suggested that it be used in an Access database format for ease of searching. We recommend that funds be available for a student to prepare a draft for the Committee and CDC experts to review and approve.
3. Three more foodworker papers in final draft form will be published in *JFP*. When the final paper, e.g., paper 9, is typeset for *JFP*, IAFF will have the complete set bound and available through IAFF for sale.
4. *Procedures to Investigate Waterborne Illness* will be initiated by the Committee in combination with the Water safety and Quality PDG.
5. All manuals in draft form should be available for work in electronic format.
6. Frank Bryan completed a history of this Committee in 1999. Frank requested that the Committee add to this for a 100 year history in 2014. Committee agreed that this should be done with additions from current and future CCFI activities. The completed history should be published in *Food Protection Trends*.
7. Recommendation from NAFSS to create a document or manual on "How to respond to a foodborne disease crisis." The Committee agreed for NAFSS to draft an outline and explore other manuals to see what format would be useful. Recommend that the Board approve the potential collaboration with NAFSS.
8. A number of symposia are being submitted electronically after a conference call in mid-August for approval by the Program Committee.
9. Recommend that there be a space on the IAFF Web site for CCFI activities including posting of presentations, symposia ppts/abstracts and educational and training materials derived from CCFI activities and publications.

**Next Meeting Date:** August 1, 2010, Anaheim, California.

**Meeting Adjourned:** 5:00 p.m.

**Chairperson:** Ewen Todd.

**Constitution and Bylaws Committee**

**Members Present:** Steven Murphy, Zeb Blanton, Michael Brodsky, Randall Dags, Ann Draughon, Kathleen Glass, Robert Sanders, Jenny Scott and Katherine Swanson (Board Liaison).

**New Members Present:** None.

**Visitors/Guests Present:** None.

**Meeting Called to Order:** 11:07 a.m., Sunday, July 12, 2009.

**Recording Secretary of Minutes:** Zeb Blanton.

**Old Business:**

- a. The published minutes of the 2008 meeting were discussed. A motion was made by Michael Brodsky and seconded by Randy Dags to accept the minutes as written and distributed. Motion passed.

- b. The committee discussed the proposed amendment to Article IV of the Constitution as distributed to the membership. Randy Dags suggested proposing a friendly amendment to change the phrase "category/categories of membership" (used three times in the proposed amendment) to avoid confusion with "categories of membership" as described in the Bylaws (Section I.A.). After extensive discussion, the committee agreed that "professional affiliation" would be a suitable substitution. Randy Dags will present this to the membership and the board as a friendly amendment during the 2009 business meeting for their approval.

**New Business:** None presented.

**Recommendations to Executive Board:** None.

**Next Meeting Date:** August 1, 2010, Anaheim, CA.

**Meeting Adjourned:** 11:50 a.m.

**Chairperson:** Steven C. Murphy.

**Foundation Committee**

**Members Present:** Gale Prince (Chair), Don Zink (Vice Chair), Stan Bailey (Board Liaison), Lisa Hovey (Staff Liaison), Larry Cohen, Jeffrey Farber, Kathleen Glass, Robert Gravani, LeeAnne Jackson, Lee-Ann Jaykus, Vickie Lewandowski, Donald Schaffner, Fred Weber and Wilbur Feagan.

**Visitors/Guests Present:** Zeb Blanton, Peter Hibbard and Isabel Walls.

**Meeting Called to Order:** 3:10 p.m., Sunday, July 12, 2009.

**Recording Secretary of Minutes:** Don Zink.

**Old Business:** Reviewed the income/expense statement, noting investment losses due to market conditions. The committee discussed the increase in student travel costs that were approved last year. The committee discussed the Audiovisual Library and changing trends in audiovisual material usage and delivery. The committee concluded that they are interested in supporting innovative approaches to delivering training/education materials or opportunities. The committee looks to the Audiovisual Library Committee to provide direction in this regard. The committee discussed prior years' ideas for fundraising. There has not been any action on this initiative and the committee remains interested in this opportunity. The committee discussed what types of presentation materials might be needed to make effective presentations to charitable lenders.

**New Business:** The committee voted to form an investment sub-committee to advise on investment policy and strategy. The Association already receives quarterly reports from its investment fund managers (Wells Fargo) and the sub-committee could interact with the association and its fund managers at those times by teleconference. Sub-committee volunteers: Don Zink, Fred Weber and Don Shaffner.

The committee directed staff to investigate the possibility of a tiered recognition system for individual foundation giving.

**Recommendations to Executive Board:** None.

**Next Meeting Date:** August 1, 2010.

**Meeting Adjourned:** 4:30 p.m.

**Chairperson:** Gale Prince.

## Membership Committee

**Members Present:** Gordon Hayburn (Chair), Donald Schaffner (Vice Chair), Vickie Lewandowski (Board Liaison), Lisa Hovey (Staff Liaison), Zeb Blanton, Jr., John Bruhn, Susan McKnight, Crispin Philpott and Edward Wellmeyer.

**New Members Present:** None.

**Visitors/Guests Present:** None.

**Meeting Called to Order:** 3:00 p.m., Saturday, July 11, 2009.

**Recording Secretary of Minutes:** Crispin Philpott.

### Action Items:

- Contact all current Membership Committee members and assess their continued interest in participating in the Committee.
- Establish a Committee Task Force to identify optimal new Committee members and solicit their participation.
- Committee members Donald Schaffner, John Bruhn, et al. to attend Sunday morning (7/12/09) Affiliate Delegate Meeting to pose questions regarding affiliate membership in IAFP: how can we deliver greater value to the affiliate membership; what can we do to promote IAFP membership?

### Recommendations to Executive Board:

1. Two options on requiring IAFP membership of exhibitor booth attendees currently attending for free:
  - a. \$50 required IAFP membership for all exhibitor booth attendees, payable upon registration;
  - b. Grant exhibitors 3 free IAFP memberships; recoup membership cost through increased booth fee.  
The committee requests that the staff review the options to determine the most effective way to move this forward and identify any issues that would make this option inappropriate.
2. Board to recognize the following Membership Committee organization changes to begin their terms at IAFP 2010:  
New Chairperson: Donald Schaffner.  
New Vice Chair: Crispin Philpott.
3. Two options for soliciting greater IAFP participation by Exhibitors:
  - a. Board to establish an Exhibitors Committee to participate in meeting planning process.
  - b. Membership Committee to establish an Exhibitors' Subcommittee, or invite exhibitor participation on the Membership Committee, to promote dialogue.
4. The Membership Committee wishes to recognize the significant contributions of the IAFP in facilitating the effectiveness of the Committee.

**Next Meeting Date:** 2010 IAFP Annual Meeting.

**Meeting Adjourned:** 4:30 p.m.

**Chairperson:** Gordon Hayburn.

## Nominating Committee

**Meeting Called to Order:** 3:35 p.m., July 12, 2009.

**Recording Secretary of Minutes:** David Golden.

**Old Business:** None.

**New Business:** Welcomed the new 2009 Nominating Committee members and discussed the process and timelines we will use for selecting nominees for the 2010 Secretary election. A few names were offered as nominations for the position, and members were asked to continue thinking of other nominees. David Golden asked members to send names of nominees to him by e-mail. David Tharp also explained the general charge of the committee.

**Recommendations to Executive Board:** None.

**Next Meeting Date:** IAFP will schedule a conference call after the close of nominations, sometime in early November.

**Meeting Adjourned:** 4:00 p.m.

**Chairperson:** David Golden.

## Past Presidents Committee

**Members Present:** Gary Acuff (Vice Chair), Kathy Glass, Paul Hall, Jenny Scott, Jack Guzewich, Michael Brodsky, Ann Draughon, Bob Sanders and Henry Atherton.

**Board and Staff Liaisons Present:** Stan Bailey and David Tharp.

**New Members Present:** None.

**Visitors/Guests Present:** None.

**Meeting Called to Order:** 3:09 p.m., Saturday, July 11, 2009.

**Recording Secretary of Minutes:** Kathy Glass.

**Old Business:** Agenda approved. Minutes were approved with the note to carry over a 2008 recommendation to Executive Board.

**Report from President:** Stan Bailey provided a report summarizing activities and progress over the past year. The Association has had another successful year, particularly when considered in context of the poor global economy. International growth continues to be strong. In addition to the annual European food safety symposium, programming has been expanded to include an annual international food safety conference with the 2008 conference held in Brazil and in Korea for 2009. IAFP will continue to co-sponsor international conferences in Dubai and China. New international affiliates will include Hungary and Columbia. Both a "Timely Topics" on raw milk and a "Rapid Response" conference on *Salmonella* in peanut products were profitable. Membership is strong; current membership is approximately 3,500, with approximately 13% of IAFP members from outside North America. The retention rate has increased to 75% and recent dues restructuring is cited as contributing to the rate improvement. Sustaining membership has increased to 101 members, with 15 Gold and 11 Silver members. In addition to the two new international affiliates, Arkansas will be issued a charter in 2009. The Student PDG continues to be active with their annual luncheon, mixer, and job fair. Annual Meeting attendance for 2009 is expected to be similar to 2008, while exhibits and sponsorship are slightly down from 2008 levels. The Foundation and General Funds were negatively impacted by the economic downturn and loss in investments. Adjustments have been made in the investment portfolio to maximize returns when the economy recovers. *Food Protection Trends* needs additional submissions of applied research

and general interest papers. *Journal of Food Protection* Online readership continues to increase and the manuscript submissions will be monitored to ensure the journal remains competitive as norms for scientific publications change. IAFP launched a new Web site, with features to improve membership service, and has entered into an agreement with Springer to provide IAFP Press for food safety publications.

**New Business:** Brief discussion about the 2011 100<sup>th</sup> anniversary of the Association's first meeting in Milwaukee, WI; special historical events will be considered. The entire IAFP Staff was commended for the continued excellence in overall administration of the Association affairs and particularly for the choice of venue and hosting the 2009 meeting at the Gaylord Texan Resort. Web site improvements and searchable annual meeting program are extremely useful features to the membership.

#### Recommendations to Executive Board:

1. Change meeting time to be conducted from 4:00 p.m. to 5:00 p.m. (on Saturday).

**Next Meeting Date:** July 31, 2010.

**Meeting Adjourned:** 4:19 p.m.

**Chairperson:** Gary Acuff, Presiding.

## PROFESSIONAL DEVELOPMENT GROUPS

### Applied Laboratory Methods PDG

**Members Present:** Christine Aleski, Patrice Arbault, Reginald Bennett, Michael Brodsky, Yvonne Chan, Alessandra Chiareli, Stefano Colombo, Julian Cox, Kristen Dixon, Ruth Eden, Elena Enache, David Evanson, Narjol Gonzalez-Escalona, Joshua Gurtler, Sun Kim, Jeffrey Kornacki, Keith Lampel, Y. Jennifer Lee, Yanbin Li, Pat Mach, Molly Mills, Xiangwa Nou, Beatriz Quinones, Patricia Rule, Thierry Sofia, Leslie Thompson, Mary L. Tortorello, Edral Tuncan, Pamela Wilger, Tamara Wood, Charles Young, Guodong Zhang and Vanessa Cranford.

**New Members Present:** Alvin Lee, Gabriela Stancanelli, Sandra Tallent, Julie Kase, Jeff Farber, Larry Cohen, Randall Phebus, Harshardhan Thippareddi, Michele Smoot, Bassam Annous, Wendy McMahon, Peter Taormina, Thomas Graham, William Northeimer, Jinru Chen, Hong Wang, Alvin Lee, Patrick Mester, Stephen Grove, Doris D'Souza, Diana Casas and Sunita Patel.

**Board Liaison Present:** Isabel Walls.

**Meeting Called to Order:** 1:00 p.m., Sunday, July 12, 2009.

**Recording Secretary of Minutes:** Leslie Thompson.

**Old Business:** The PDG held three educational sessions this past year which were successful. On Dec. 2, 2008, a webinar presentation on Different Molecular Techniques for subtyping *Campylobacter* spp. was given by Robert Miller from Auburn University. There were 17 participants on the call. On Jan. 29, 2009, the topic was Equipment Validation and Liquid Sterilization with two guest webinar presenters, Guy Snelling from InterCal and Russ Nyberg from Ravenlabs. There were 20 participants on this call. On June 24, 2009, the format of the call was an interactive discussion panel. The guest speakers were Dr. Donald Schaffner – Rutgers University, Dr. Katherine Swanson – Ecolab Inc., and Dr. Bassam Annous – USDA Food Safety Intervention Technologies Research. There were 30 participants who attended the call. The expert panel overview included the important components to consider in performing a produce validation. The primary purpose of antimicrobial used in produce washing and monitoring their effectiveness in the system via verification. Conventional

washing technologies were discussed as well as novel methods for sanitation treatments. The discussion portion of the call was interactive between the panel and PDG members questioning the challenges and issues observed in produce washing. The Sample Prep Working Group worked on a white paper that has been accepted for publishing out of the *Journal of Food Protection*. The subcommittee of the sample prep working group is still in progress and needs to determine the approach for breaking into specific commodities. The logo presented at the IAFP meeting last year was decided in November 2008 to be a flask with blue background and no bubbles and has been in use since the recommendation.

**New Business:** The Board Representative, Dr. Isabel Walls, informed the PDG of the symposia submission date of October 19. Also, that the process had changes and the proposals would not be presented in person to the program committee.

#### 2010 IAFP Applied Lab Methods Program Proposals:

##### Symposia

- Novel methods for non-pathogenic *E. coli* and non-*E. coli* O157:H7 detection (Michael Brodsky).
- Bacterial toxins: *Staphylococcus aureus*, *Clostridium botulinum* and *Bacillus cereus* (Patrice Arbault).
- Toxigenic mold and food safety (Michael Brodsky) – It was recommended that ISL N.A held a symposium on this topic in the past and the topic should be investigated to build on the topic.
- Less recognized and presumptive pathogens (Purnendu Vasavada).
- Economic adulteration – threat agent detection for food (Pam Wilger).
- Test considerations in light of changing regulations (Jeff Kornacki).

##### Workshop

- Virus detection methods (Mary Lou Tortello) – It was suggested that this could be a joint effort with the Viral PDG.
- Mold workshop repeated that had great success in 2008.

The PDG also discussed 2010 topics of interest for webinars or panel discussion educational ideas.

- Issues with emerging food commodities (peanut butter, cookie dough).
- Lab accreditation.
- USDA or FDA program on sampling and guidelines.
- Using Six Sigma to improve your lab's efficiency.
- Statistical trending and data analysis.

It was discussed that the PDG should continue coming up with ideas and thinking of symposia and workshops for 2010. This year is a unique scenario where ideas can be processed after attending the conference for building on symposia topics. It was also suggested that the final list of symposia topics should be shared with the other PDGs to determine if any of their members had an interest in participating on that topic.

#### Recommendations to the Executive Board:

1. Recommend the approval of Leslie Thompson as Vice Chair.
2. Recommend that the Board support webinars and educational sessions with adding features for multiple presenters, international call-in numbers, recordable features and attendance/roll of participants.
3. Recommend that the Board reserve a one-day meeting room on Saturday at the 2010 IAFP Annual Meeting for purpose of the Sample Prep Working Group.

**Next Meeting Date:** September 25, 2009 to discuss final list of 2010 symposia and workshop ideas.

**Closing Remarks:** Thank you to the PDG members for your hard work and dedication to the PDG. Thank you to Pat Rule and bioMérieux for supporting our webinars.

**Meeting Adjourned:** 2:10 p.m.

**Chairperson:** Vanessa Cranford.

### Beverage PDG

**Members Present:** Frank Burns (Chair), Jacquelyn Miles, Joe Shebuski, Julie Kuruc, Kenneth Janes, Mangesh Palekar, Peter Kennedy, Kathleen Lawlor, Mickey Parish and Larry Beuchat.

**New Members Present:** Hisato Ikemoto, Dean Davidson, Chuck Czuprynski, Eric Amann and Suresh Pillai.

**Board Liaison Present:** Isabel Walls.

**Meeting Called to Order:** 2:00 p.m., Sunday, July 12, 2009.

**Recording Secretary of Minutes:** Frank Burns.

**Old Business:** No old business was discussed.

**New Business:** Members were welcomed and anti-trust "do nots" were read from the committee meeting handbook.

The impact of the new FDA bottled water rule and the impact on regulation of flavored and fortified waters, as well as sports drinks, was presented as a potential topic for a symposium for 2010 and supported by the committee.

-Kathy Lawlor will work to attempt coordination with Food Law PDG to see if they would like to partner on this symposium.

The resubmission of the wet work shop for yeast and mold identification for 2010 was discussed.

The workshop had been fully subscribed in 2008. It was discussed that a more beverage spoilage-directed inclusion of lactics and *Alicyclobacillus* be added. The committee felt that keeping the work shop as is, and providing a webinar on *Alicyclobacillus* methods would be a better option.

Frank Burns will determine if laboratory facilities are available (Perhaps Chapman College) Mangesh Palekar, Jackie Miles and Julie Kuruc will organize the workshop if lab space can be identified.

Joe Shebuski and Frank Burns will organize the *Alicyclobacillus* webinar.

Interest in presentation of issues regarding botulinum toxin in beverages was discussed, it was considered that this might fit into chemical hazards, and that it should be discussed with that PDG.

Frank Burns will contact Chemical Hazards PDG to see if there is common interest.

Interest in a workshop addressing microbial issues with minimally-processed juices and more complex beverages, including low acid and vegetable juices, was discussed.

A symposium "packaging, sustainability and food safety" looking at the intersection of these elements was discussed and supported by the committee.

Frank Burns and Kathy Lawlor will work on fleshing out this proposal.

Committee chair will send monthly updates to committee members on the status of these proposals until actual submission date in October.

### Recommendations to Executive Board:

1. Give weight to the availability of convenient laboratory space for potential wet work shops in decision for future meeting locations.
2. Kathy Lawlor was elected Vice Chair.

**Next Meeting Date:** August 1, 2010.

**Meeting Adjourned:** 3:30 p.m.

**Chairperson:** Frank Burns.

### Dairy Quality and Safety PDG

**Members Present:** Allen Saylor (Chair), Joseph Odumeru (Vice Chair), David Blomquist, Dennis Bogart, Don Breiner, Yvonne Chan, Warren Clark, Jr., Randall Daggs, Dan Erickson, Eugene Frey, Dennis Gaalswyk, Loralyn Ledenbach, Thomas McCaskey, Lindsey McDonnell, Steven Murphy, Gary Pruitt, Amanda Rife, Sherry Roberts, Ronald Schmidt, Steven Sims, Gry Dawn Terrell, Purnendu Vasavada and Phillip Wolff.

**New Members Present:** Patrice Arbault, Phyllis Posy, Brian Thane, Bob Koeritzer, Larry Cohen, Nurliza Buyong, Heather Craven, Niteen Sawant, William Northeimer, Thomas Graham, Christophe Dufour, Ravinder Reddy, Christina Belperio, Sharon Wilson, Fred Weber, Linda Leake, Fritz Lembke, Gene Wright, Nancy Silvester, Arlette Shazer, David Laird and Jeff Farrar.

**Board Liaison Present:** Vickie Lewandowski.

**Meeting Called to Order:** 2:00 p.m., July 12, 2009.

**Recording Secretary of Minutes:** Joseph Odumeru.

1. Welcome and Role Call of Attendance: Chair Allen Saylor led with 45 members and visitors present. Each meeting participant present was asked to give a brief introduction about themselves and their employer. Vickie Lewandowski, President Elect and Dairy PDG Liaison spoke about changes to symposia proposals' submission. Symposia proposals are due on October 19 and no longer due during the IAFP Annual Meeting. This is to give program committee time to adequately review the proposals. Program committee will evaluate the meeting proposals and the submitters will be notified regarding acceptance of their proposal for further development by Nov 4. Program committee will meet early January to review proposals and provide notification of acceptance by Feb 3rd. Initial submissions are to be done online. She also indicated that the PDG meetings are for discussions of relevant issues in their field and also provide opportunities for networking. Vickie also indicated that there will be discussions on the future of the *Food Protection Trends (FPT)* publication. The content of the publication need to be more applied technical articles. She suggested having each PDG submit at least 2 applied technical articles per year and Chair Saylor encouraged PDG members to recommend ideas for submission to him or directly to *FPT*.
2. Past Chair's comments: Lori thanked the group for the support she received as Chair for the past couple of years and encouraged the group to provide the same support to the new chair.
3. Chair Saylor indicated that there will be a conference call during the month of August to discuss Dairy PDG proposals for submission to the IAFP program committee in October. The minutes of the last face-to-face meeting held on August 3, 2008, and conference calls held October 27, 2008, January 22, 2009 and April 6, 2009 were reviewed and David Blomquist moved for adoption and seconded by Amanda Rife.
4. Dr. Ewen Todd spoke about the planning for the upcoming conference on Risk Assessment – Pros and Cons of Raw Milk Products. No agenda committee had been

formed yet but he requested volunteers from the PDG and ideas for potential speakers. A list was circulated requesting volunteers.

- Chair Saylor summarized the 2009 IAFP program presentations and posters with a dairy focus and encouraged members to participate in each. He also reviewed various Dairy Quality & Safety PDG programs submitted and accepted by the Program Committee. These include the *Listeria monocytogenes* Controls by Yvonne Chan Kraft Foods; War on Water Cleaning for Low  $a_w$  Food, Dale Grinstead, Johnson Diversey coordinated with Food Safety PDG; Storage and Unrefrigerated Display of RTE Foods, Allen Saylor, IDFA coordinated with the Retail Food PDG and Third Party Certification: Does This Improve Food Safety, Dennis Gaalswyk and Allen Saylor.

#### Old Business:

##### A. Raw Milk Subcommittee:

- Dr. Ron Schmidt, Chair of the Raw Milk Subcommittee summarized the successful Raw Milk, Emerging Public Health Threat Timely Topic organized by PDG members in February 2009 and some of the take-aways. He also reviewed current and upcoming programs and indicated that the subcommittee is making inroads on communicating the risk associated with consumption of raw milk. Dr. Schmidt thanked Amanda Rife and Nancy Eggink for development of a Raw Milk Committee task table that is being used to direct the subcommittee focus and direction. There is a need for more participants in the subcommittee.
- The role of IAFP in providing testimonial documents in support of food safety issues was discussed, with some concern by members on IAFP's position of not allowing the organization to be represented on letters to state legislatures opposing the expansion of raw milk laws and regulations. The organization need to be more responsive in addressing state raw milk legislation as well as media coverage glamorizing the life style of raw milk advocates without address the food safety risks. Chair Saylor agreed to raise this issue with Mr. Tharp and the IAFP Board of Directors.
- There were comments that unpasteurized milk are not allowed for sale in Canada and Australia.
- Dr. P. C. Vasavada noted that NEHA has a policy paper pointing out the dangers of raw milk consumption and that AVMA was hosting a half-day symposium at their meeting in Seattle at the same time as the 2009 IAFP meeting.
- Chair Saylor challenged the Raw Milk Subcommittee to establish goals and priorities for the next year, schedule a set of conference calls for the next year, finalize a model letter to be sent to state legislatures that includes organizations willing to sign on to the letter, develop a raw milk webpage that contains the facts and risks related to raw milk consumption by humans, develop a mechanism for tracking raw milk state legislation during the December 2009 – May 2010 period, and identify lists of regional and national dairy safety expert teams that include nutritionists, medical doctors, dairy processors, dairy producers, dairy microbiologist, state and federal dairy regulators and parents of children that became ill from the consumption of raw milk. These expert teams should be organized in a way so they are available to testify or speak on the issue of raw milk consumption

by humans for any group interested, particularly at state legislative hearings. Dairy PDG members are to send names to Ron for compilation.

- It was suggested by PDG members that the Raw Milk Subcommittee should develop Fact Sheets on Raw Milk Quality and Safety Issues. Need catchy names to encourage readership.
  - PDG members pointed out that there was a need to use the social networking sites like Facebook, Twitter, etc. to also get the message out about the risks of raw milk consumption.
  - Dr. Schmidt agrees to continue as chair of the raw milk subcommittee. Names of PDG members interested in the development of the Web site are to be sent to him.
- B. Update the IAFP Dairy Quality & Safety PDG Webpage. Outgoing Chair Lori Ledenbach volunteered to work on this as it does not contain very much information at the present time. Dairy related information for the Web site can be sent to Lori including dates and times of dairy-related meetings.
- C. *Listeria* Control Brochure. Dr. Lisbeth Godik's two summaries of her Food Protection article were combined by Dawn Terrell and will be distributed to Dr. Godik and PDG members for final comments, then published by IAFP. In addition, when completed, Dawn Terrell will start working on a poster version by August 15. Robert Salter and P. C. Vasavada volunteered to assist.

#### New Business:

##### A. Possible Projects:

- Chair Saylor suggested PDG members consider establishing a working group for improvement and organization of an IDFA document submitted to FDA that compiled all of the questions and answers from the FDA memos for the National Conference on Interstate Milk Shippers Grade A milk program. Currently, this valuable information exists in many separate documents, some not even available electronically. IDFA staff had compiled all of these into one large Word document and forwarded it to FDA, but did not organize it by subject matter. Steve Sims, FDA, was not aware of the document, but agreed it could be a helpful tool to the US dairy industry. Phil Wolff, USDA; Steve Sims, FDA; Sherry Roberts, Texas Dept. of Health Services; Dr. Ron Schmidt, U. of Florida and Dennis Gaalswyk agreed to serve on such a working group responsible for organizing the Q & As into subject areas hyperlinked from a Table of Contents. Mr. Sims (US FDA) agreed to lead this group.
- There was a discussion on the compilation of State Dairy Labs Testing Capabilities. Dr. Tom Graham pointed out this was already done and recorded in the NCIMS Listing Manual that is updated frequently. Chair Saylor pointed out that most state dairy labs have testing capabilities beyond what is included in the NCIMS listing. There was concern about the effort to keep such a compilation current. Because of the PDG workload, this idea was tabled for the present.
- Another idea that might be of helpful was to compile individual state requirements/criteria for hiring and promoting dairy farm and plant inspectors. PDG members were undecided as to the specific value of this effort and agreed to set it aside for future discussion.
- Three other ideas including drafting a "Product Recall Guideline", a compilation of animal drug acceptable for use in dairy cattle, and a comparison of the Global Food Safety Initiative (GFSI) schemes were all discussed, but tabled for later review.

5. Bob Salter suggested that it would be very helpful to develop a compilation and trend analysis of the Third Party Drug Database issues annually by FDA. He suggested that the FDA contractor might be able to do this work. Bob, Steve Sims and Chair Saylor agreed to work on this idea and provide the PDG with information at a future meeting or conference call.
- B. 2010 Symposium Ideas: Chair Saylor and outgoing Chair Ledenbach 2010 reviewed ideas submitted to them. PDG members strongly encouraged more dairy-specific topics or maybe a separate dairy tract on Monday of the Annual Meeting. PDG members views are captured below.
1. National Food & Water Safety Regulatory Program Updates – USDA, FDA (NCIMS), EU, ANZED, CFIA, etc. – supported.
  2. Better Process Cheese Workshop – supported since had been successfully given 2 years ago and was a federal requirement for processed cheese plants.
  3. International, National and Private Food Equipment Standards – Effective, Competitive or Conflicting (3-A, AMI, EHEG, DIN, NSP, ANSI, FDA, USDA, NRA, GMA, etc.) – supported.
  4. FDA Core Dairy Training Workshop (Dairy Plant Inspection, Dairy Farm Inspection, Special Problems, Advanced Training, Pasteurization Controls, etc.) – must be scheduled and coordinate with FDA's State Training Branch and the State of California Department of Agriculture no later than September 2009 in order to have the week prior to the 2010 IAFP Annual Meeting in Anaheim. Will be 3.5 – 5 days in length. Intent to get more state dairy regulatory staff to attend IAFP Annual Meetings – supported. Chair Saylor and Steve Sims will work on details to determine whether all parties can work out scheduling challenges.
  5. Technical Requirements for Milk Heating Process – UHT, ESL, etc. – supported.
  6. Single Food Agency – Pros & Cons – use speakers from CFIA, EFSA, FDA, USDA, ANZED, etc. – mild support.
  7. Things That Keep Me Up at Night – Dreaming of Food Safety Nightmares) Lori Ledenbach's idea) – supported.
  8. Keys to Effective Employee Food Safety Training – Dennis Bogart's idea – supported and will need to coordinate with the Education PDG.
  9. Chemical Hazards Including Melamine – Where are We Now? – mild support.
  10. Applications of Pathogen Risk Assessment in Low Moisture Dairy Product – Yuhaun Chen presented a topic – supported.
  11. Effective Traceability Programs – supported.
  12. Workshop on Predictive Microbial Modeling for Dry Food Products – supported.
  13. Insurance and Financial Risk Protection for Food Processing Plants – supported.
  14. Mechanics and Accreditation of Automated Cleaning Systems – proposed by CSP asking for DQS PDG support – supported.
- Develop a mechanism for tracking raw milk state legislation from December 2009 – May 2010.
  - Identify lists of regional and national dairy safety expert teams that include nutritionists, medical doctors, dairy processors, dairy producers, dairy microbiologist, state and federal dairy regulators and parents of children that became ill from the consumption of raw milk.
  - Draft and finalize a laminated one-page factsheet on Raw Milk Quality and Safety for IAFP publication.
  - Coordinate with AVMA to develop a website containing factual and scientific information about the risks of raw milk consumption to offset the large number of websites containing mis-information that misleads consumers. Funding will be obtained from private sources.
3. Support updating the IAFP Dairy Quality & Safety PDG Web page by outgoing Chair Lori Ledenbach to include factual information on the dairy industry, more details on PDG minutes, meetings, conference calls, and activities, an international dairy meetings and events calendar, etc.
  4. Agree to publish a *Listeria* Control brochure (when completed), based on a summary of Dr. Lisbeth Godik's *Food Protection Trends* article from 2008.
  5. Support further development of the following possible 2010 Program ideas:
    - National Food & Water Safety Regulatory Program Updates.
    - Better Process Cheese Workshop.
    - International, National and Private Food Equipment Standards.
    - FDA Core Dairy Training Workshop (Dairy Plant Inspection, Dairy Farm Inspection, Special Problems, Advanced Training, Pasteurization Controls, etc.) – must be scheduled and coordinate with FDA's State Training Branch and the State of California Department of Agriculture.
    - Technical Requirements for Milk Heating Process – Pasteurization, UHT, ESL, etc.
    - Single Food Agency – Pros & Cons – use speakers from CFIA, EFSA, FDA, USDA, ANZED, etc.
    - Things That Keep Me Up at Night – Preventing Food Safety Nightmares.
    - Keys to Effective Employee Food Safety Training.
    - Chemical Hazards Including Melamine – Where are We Now?
    - Applications of Pathogen Risk Assessment in Low Moisture Dairy Product.
    - Effective Food Product, Ingredient and Packaging Traceability Programs.
    - Workshop on Predictive Microbial Modeling for Dry Food Products.
    - Insurance and Financial Risk Protection for Food Processing Plants.
    - Mechanics and Accreditation of Automated Cleaning Systems.

#### Recommendations to Executive Board:

1. It is widely recognized that IAFP is an internationally-recognized food safety organization and as such, we are asking the Board to authorize Mr. David Tharp, as IAFP's primary representative, to sign onto letters intended to be sent to State Legislative committees during the December 2009 – June 2010 timeframe identifying risks related to the consumption of raw milk by humans.
2. Support ongoing efforts by the Raw Milk Subcommittee to:

**Next Meeting Date:** A conference call is planned for mid August 2009 to flesh out the ideas and present a choice to IAFP meeting program committee by October 19, 2009.

**Meeting Adjourned:** 4:30 p.m.

**Chairperson:** Allen Saylor.

## Food Chemical Hazards and Food Allergy PDG

**Members Present:** Peter Slade (Chair), Linda Leake (Vice Chair), Richelle Beverly, Ken Davenport, Tong-Jen Fu, Gale Prince, Thomas Schwarz and Pamela Wilger.

**New Members Present:** Susanne Keller, Tony Flood, Craig Henry, Dojin Ryu, Patrice Arbault, Chuck Czuprynski, Vanessa Teter and Maria Christina Tirado.

**Visitors/Guests Present:** Yvonne Chan, Charles Papa and Annette Langenbacher.

**Board Liaison Present:** Isabel Walls.

**Meeting Called to Order:** 9:00 a.m., July 12, 2009.

**Recording Secretary of Minutes:** Linda Leake.

**Old Business:** Following welcome to all by Peter Slade, self introductions of all present, and a brief review of the minutes of the 2008 PDG meeting, a discussion was conducted regarding the outcome of symposia proposals generated by this PDG at the 2008 annual meeting. Tong-Jen Fu reported that the proposals she had developed with others had been accepted and scheduled either as proposed or in a modified version. These 2009 symposia are S13 - Best Practices for Cleaning and Validation, S18 - Looking for Thresholds: A Multi-disciplinary Key Events Approach and S24 - Emerging Chemical Hazards in Food. Linda Leake stated the proposal on diacetyl as an inhalant chemical hazard had not been accepted.

Isabel Walls was asked if the board had made any decisions about developing a packaging PDG, which had been recommended by this PDG in 2008, and she promised to follow up and report the outcome to us.

A brief discussion was conducted on how to reinstate recent previous efforts to get toxicologists, especially members of the Society of Toxicology, to join iAFP, attend the annual meeting and get involved with this PDG. Possibly using again a flyer developed in 2007 by this PDG was discussed, as was the plan to keep this general recruiting effort in the loop of ongoing activities.

**New Business:** Board Liaison Isabel Walls provided an update on the new deadline for submitting symposium proposals, which is October 19. Notification of the program committee's decision about acceptance or rejection of proposals will be December 4, and final outlines of accepted proposals will be due February 3, 2010. Dr. Walls encouraged the PDG to consider creating articles for *Food Protection Trends* and stated that articles from symposium speakers based on their presentations would be welcome and encouraged by the board. She mentioned iAFP would financially support conference calls conducted by PDG members to discuss PDG activities and issues.

Extensive and lively discussion was conducted by the group about hot topics of interest relative to food allergens and food chemical hazards, and how best to proceed with programs to address them, including possible symposia, round table discussions, workshops, webinars, etc.

It was a consensus that, relative to any specific topic, it would be of greatest appeal to the general iAFP membership to address global ramifications, and where appropriate, a farm to fork approach, including production, processing, retail, laboratory, regulatory and scientific/research/academic components and inputs.

Moreover, discussion included the possibilities of approaching and engaging various other PDGs to collaborate in the development of symposia and other potential programs and

activities of mutual interest. Members that volunteered to approach other PDGs, especially Fruit and Vegetable Safety and Quality, Food Hygiene and Sanitation, Applied Laboratory Methods and Dairy Quality and Safety, included Tong Gen Fu, Susanne Keller, Ken Davenport, Pam Wilger and Yvonne Chan.

Volunteer teams were formed to pursue development of several specific topics: (1) Susanne Keller proposed a symposium devoted to nuts, potentially including, but not limited to, an overview of the nut industry, mycotoxin contamination/new testing methods, sanitation issues, allergen control issues and new legislation. She will assume leadership, and Linda Leake will assist; (2) Representing herself and Arun Bhunia (not present) as co-developers and potential co-convenors, Linda Leake outlined the details of a symposium proposal well underway relative to advances in testing technologies for chemicals to address food safety and food defense needs; (3) Chemical hazards relative to packaging, including nanotechnology for detection will be developed by Tony Flood and Linda Leake; (4) Craig Henry and Gale Prince will follow regulatory developments relative to BPA and viable alternatives to BPA in packaging. If approval of the iAFP Board can be procured, they will pursue development of a possible iAFP symposium and perhaps a one-day meeting in the Washington, D.C. area for key stakeholders, which might be held in early 2010; (5) Tony Flood, Patrice Arbault, Vanessa Teter and Linda Leake will pursue differentiating wheat allergy and gluten issues and the global picture of celiac disease; (6) Christina Tirado will develop a proposal on benefit analysis and methodologies regarding the effect of environmental contaminants on various food production systems, including trade-offs of various practices and (7) Yvonne Chan will spearhead a farm to fork overview of melamine issues and updates.

Linda Leake briefly shared highlights of a memo from a Canadian food safety consultant to Mark Moorman (not present) asking for input on the availability of food allergen icons for such specific products as shellfish and sulphite. Prior to the PDG meeting, Mark had emailed Peter Slade and Linda Leake asking if this PDG might be willing assume leadership for clarifying/updating/creating an allergen icon specific to crustaceans, as the Canadian consultant had expressed concern about confusion of defining and recognizing fin fish, shell fish and crustaceans individually. Linda volunteered to contact both the Canadian consultant and Mark Moorman after the iAFP meeting to discuss how best for the PDG to proceed with this project. She will then share details with the group, at which time a consensus can be determined as to if and how we should proceed with such a project.

### Recommendations to Executive Board:

1. Pamela Wilger suggested this PDG ask the board about what specific financial support would be available for any webinars and recording of webinars and other programs. Also, she was interested in knowing to what extent the board would support the PDG asking industry for financial support of our PDG programs, such as webinars, etc.

**Next Meeting Date:** August 1, 2010.

**Meeting Adjourned:** 10:59 a.m.

**Chairperson:** Peter Slade.

## Food Hygiene and Sanitation PDG

**Members Present:** Todd Rossow, Dennis Bogart, Dale Grinstead, Jill Kuzo, Fred Reimers, Thomas Schwarz, O. Pete Snyder, Sharon Wood, Rocelle Clavero, Ken Davenport, Kenneth Janes, Jeffery Kornacki, Donald Lane, Yale Lary, Zeb Blanton, Charles Glambrone and Y. Jennifer Lee.

**New Members Present:** William Huntley, Phyllis Posy, Heather Craven, Abdulaziz Alsheikh, Mangesh Palekar, Keith Warriner, Zhinong Yan, Joseph Stout, Thomas McCaskey, Cristina Tirado, John Allan, David Rasmussen, Susanne Keller, John Duke, Jack Guzewich, Jeffery Brown, Ian Jenson, Amy Simonne, Peter Slade and Tong-Jen Fu.

**Meeting Called to Order:** 1:00 p.m., Sunday, July 12, 2009.

**Recording Secretary of Minutes:** Todd Rossow.

- Introductions.
- Todd read the prepared Antitrust Statement.
- Lee-Ann Jaykus reviewed the new process for submitting ideas for the annual conference. Same form, but submissions are due to IAFP by Oct 19th. By Nov 4th IAFP will contact the PDG with their decision. By Feb 3rd all final symposia, etc. Will be due to IAFP. She added that the Board was encouraging each PDG to submit a paper for publication in the *Food Protection Trends* magazine. There was discussion if submissions would be presented before the Program Committee on July 14th. Lee-Ann confirmed that there would be no committee meeting.

#### Old Business:

- Special thanks to Dale Grinstead for his commitment and leadership with the PDG over the last 4 years.
- We briefly discussed the minutes from the 2008 meeting that were sent to the members prior to this year's meeting. Dale Grinstead motioned that the notes be accepted and Dennis Bogart seconded. All approved.
- Rocelle Clavero and Yale Lary were recognized for their organization and contributions to the 2009 Workshop. Cleaning by Design – What Can Go Right: Rocelle gave special recognition to Dale Grinstead for his leadership.
- Dale reviewed the 3 symposia that are on the agenda for this week.
- Sterilant Gas Decontamination of Food and Environments and Emerging Technology – Organizers/Conveners: Joshua Gurtler, Jeffery Kornacki and Yale Lary.
- The War on Water: Cleaning for Processors of Low a<sub>w</sub> Food Organizer/Convener Dale Grinstead.
- Best Practice for Cleaning and Validation – Organizers: Ken Davenport, T.J. Fu and Lauren Jackson, Conveners: Christopher Griffin and P.C. Vasavada. Discussion around improvement ideas for the workshop.
- The workshop did not have the number of attendees that we had hoped. Twelve registered.
- We need to define better ways to advertise the event.
- There is a need for better guidelines to ensure a more successful event. Possibly put together these guidelines and share with the Board.
- Some would like to do it again, but feel we need to come up with a lessons learned.
- Also investigate ways to reduce the cost. It was mentioned that this is not a money maker for IAFP.

#### New Business:

2010 Symposia ideas:

1. The group discussed ways we could take the approach with ideas from the workshop and provide something targeted and effective. The discussion resulted in the ideas around the development of:

- defining and hosting a series of webinars targeting various aspects of cleaning and sanitation between now and the next conference,
- publishing a paper in *FPT* around sanitation and sanitary design to help stimulate the 2010 conference roundtable and workshop,
- putting together a roundtable and
- hosting a half-day workshop before the conference.

A core group involving Rocelle, Yale, Dale, P.C., Keith Warriner and Jill Kuso along with other members of the PDG will develop over the next several weeks – Fundamentals on Sanitation, Sanitary Design, Dry Cleaning Challenges, etc.

2. Jeff Kornacki suggested a half-day symposia around Emerging Disinfectant Technologies. Jeff will work on this proposal and share with the group.
  3. Purnendu (P.C.) Vasavada suggested aligning with the Applied Methods and Dairy PDGs and develop a symposium or workshop around sampling. This could be a Part II to the very well attended sampling workshop (sold out) from this past Saturday. Possibly design a case study involving peanut butter.
  4. There was discussion that the Chemical & Allergen and Fruits & Vegetable PDGs may want support from our PDG on a symposium related to nuts. No action is needed on this item.
- The group had 2 nominations for Vice Chair of the PDG – Rocelle Clavero was nominated by P.C. Vasavada and Jeff Kornacki by Dale Grinstead. Based on 9 out of 13 members voting Jeff was selected as the next Vice Chair.

#### Recommendations to Executive Board:

1. The PDG would like to submit Jeff Kornacki as the Vice Chair for the Food Hygiene and Sanitation PDG.

**Next Meeting Date:** August 1, 2010.

**Meeting Adjourned:** 3:00 p.m. Todd motioned to adjourn the meeting and Zeb seconded. All agreed.

**Chairperson:** Todd Rossow.

### Food Law PDG

**Members Present:** Caroline Smith DeWaal (Chair), Jenny Scott (Vice Chair), Lee-Ann Jaykus (Board Liaison), John Allan, DeAnn Benesh, Scott Crerar, Carl Custer, Emilio Estaban, Craig Harris, Mickey Parish, Thomas Schwartz, Gloria Swick-Brown, Kevin Webster and Christina Wilson.

**New Members Present:** Amanda Tian, Gina Nicholson, Andrew MacCabe, Pat Curtis, Rachel Teoh, Yale Lary and Jeff Kornacki.

**Visitors/Guests Present:** Maria Cristina Tirado and Beilei Ge.

**Meeting Called to Order:** 2:10 p.m., Sunday, July 12, 2009.

**Recording Secretary of Minutes:** Christina Wilson.

Welcome and news from the IAFP Board presented by Lee-Ann Jaykus.

After a welcome and introductions, the committee discussed what IAFP desires from the Food Law PDG – more sharing of information between committee members; increasing the international perspectives on food law issues; written materials for IAFP, like booklets and white papers; as well as the development of



cutting edge symposia or workshops. As part of the introduction, the committee discussed the change in the deadline for submission of symposium and the need to meet periodically between meetings

**Old Business:** The Vice Chair, Jenny Scott, gave highlights of last year's meeting from last fall's *Food Protection Trends*. Last year, one of two symposia proposed by Food Law PDG was accepted thanks to Deon Mahoney (Food Safety Challenges Impacting Global Food Trade) and the PDG contributed to an additional one as well, thanks to Craig Harris (Round Up Your Pathogen Plan). There was a motion to accept the minutes by Carl Custer, seconded by Tom Schwartz and approved by the Committee.

Next there was discussion of this year's meeting and symposium of interest to Food Law PDG members.

**New Business:** The committee discussed national activities in the US and FDA legislation. Legislation has been introduced in both houses of Congress. The House bill, entitled the Food Safety Enhancement Act of 2009, has made most progress. This bill is sponsored by leaders in the House Energy and Commerce Committee, including Congressman John Dingell and Chairman Henry Waxman, and it recently passed both the subcommittee and full committee without opposition. The legislation is built on a HACCP framework and includes performance standards, strong enforcement provisions, mandatory recalls, mandatory inspection frequencies, registration structure and fees.

All process control provisions and standards in legislation will apply to both domestic and foreign facilities that sell food or food ingredients in the United States. The food law committee discussed the legislative structure of the international oversight of food safety, especially the nation-to-nation certification system included in both bills, and third party certification. The committee discussed the President's Food Safety Working Group briefing from earlier in the week, with an announcement that included Vice President Joe Biden.

The committee then had reports on national law changes in other countries. Scott Crerar reported that New Zealand has proposed requirements for raw milk products (cheeses) but their Domestic Food Review (HACCP-based legislation) is stalled. Kevin Webster reported from Canada that they were considering mandatory traceback on livestock and poultry by 2011.

Emilio Esteban reported on the recent Codex Alimentarius Commission meeting, with 600 delegates from all over the world, which had a discussion on the issue of private versus public food safety standards. The Commission also approved a *Listeria* standard for foods that do not support growth.

Finally, the committee agreed to a conference call around December 15.

Symposia topics:

- 1. ARE NATIONAL STANDARDS AND PRIVATE STANDARDS COMPETITIVE OR COMPLEMENTARY?**  
Planners: Kevin Webster, John Allen, Andy McCabe, Craig Harris and Caroline Smith DeWaal.  
The committee recommended that the planners try to incorporate a discussion of regulation vs. guidelines on national standards and have panelists describe how the different standards can work together. International speakers might include a representative of the European retailers and Chinese producers.
- 2. CRITERIA AND TOOLS FOR COMPARING NATIONAL FOOD SAFETY PROGRAMS**  
Planners: Caroline Smith DeWaal, Emilio Esteban, DeAnn Benesh and Carl Custer.

The committee advised that the planners should look at tools available through PAHO, WHO and FAO, as well as the European system of auditing national governments, and systems for determining equivalency.

- 3. INGREDIENT-BASED OUTBREAKS: WHO IS RESPONSIBLE (OR LIABLE) WHEN PATHOGENS ARE SPREAD THROUGH IMPORTED INGREDIENTS**

Planners: Christina Wilson, Gloria Swick-Brown, Yale Lary and Caroline Smith DeWaal.

The committee advised that outbreaks illustrative of this problem include sprouts and grain or milk powder contaminated with melamine.

**Recommendations to the Board:** None.

**Next Meeting Date:** Conference call on December 15.

**Meeting Adjourned:** 4:00 p.m.

**Chairperson:** Caroline Smith DeWaal.

### Food Safety Education PDG

**Members Present:** Renee Boyer (Chair), Gary Acuff (Board Liaison), Andrew Benson, Christine Bruhn, Benjamin Chapman, Julian Cox, Patricia Curtis, Timothy Gregg, Matthew Jenkins, Sandra McCurdy, Amarat Simonne and Brian Turner.

**New Members Present:** Rachel Teoh, Adrienne Shearer, Anne Wilcock, Brita Ball, Juliana Ruzante, Kerri Harris and Jennifer Quinlan.

**Visitors/Guests Present:** Annette Lanenbacher and Brian Sheldon.

**Meeting Called to Order:** 9:05 a.m., Sunday, July 12, 2009.

**Recording Secretary of Minutes:** Renee Boyer.

**Upcoming Symposium:** Wednesday morning: "Measuring and interpreting food handling behavior and its impact on policy".

#### Wikipedia Project:

##### Discussion:

This project would consist of editing current Wikipedia posts regarding food safety information in order to make sure that the information which consumers are reading about is accurate.

- Develop a working list of primary topics we would like to make a priority.
- Make sure that we include international topics to the list.

**Question to the Executive Board:** How should we use nomenclature for individuals that add edits/content in a Wikipedia topic area?

- Ex: Everyone has a individual user name, w/ IAFP added at the end of the user name so that everyone knows that the information is from a valid source (Ex: Renee Boyer - IAFP).
- Does the Executive Board feel that this is appropriate?
- We developed a subcommittee to work on the Wikipedia project: Ben Chapman, Sandy McCurdy, Christine Bruhn, Amy Simone and Andy Benson.

Goal: To hold a conference call in 1-2 months to discuss topics and assign work, approach to get work done.

#### Update on Workshop Submission from Last Year:

Susan Sumner took the pre-meeting workshop forward to the Executive Board. It was titled: Factors on Risk Communication. It

was submitted to program committee. It was perceived very highly, but was not selected as a workshop for 2009.

Members felt that this should be re-submitted as a workshop for 2010.

Suggested outside collaborators: National Alliance for food safety, FAS and APEC.

**Format:** Two-day risk communication workshop with a fee – revenue would go to IAFF as well as Alliance (group that involved many Universities that pull research). We could have it in several different locations across the country w/one location being as a pre-meeting workshop for IAFF members.

PDG should apply for a grant from the USDA (which offers up to 50,000.00 for a grant for conferences and workshops). There is no deadline for this grant program...you just submit whenever you wish and if there is money, then they may accept or not.

Potential PDG collaborators: Microbial Modelling and Risk Analysis PDG.

Sub-committee: Andy, Benson Tony Flood, Pat Curtiss, Renee Boyer and Amy Simone.

#### **New Business:**

**Election of New Vice Chair:** Ben Chapman, all in favor. Ben accepted the position; we will bring this to the Board on Monday morning.

Gary Acuff: There will be changes to FPT in the future. Looking to the PDGs for input in review articles.

#### **Potential Symposium Topics for 2010:**

1. Using technology for teaching: sharing teaching tools that have been identified so that no one is re-inventing the wheel.
  - a. Target audience: trainers and higher level individuals that would then come back and
  - b. Topic Ideas:
    1. Needs to address knowledge gaps... why is training needed? (should bring in someone that evaluates, not necessarily a food microbiologist or food safety professional).
    2. Nancy Franz.
    3. David Diehl.
    4. Traditional tools.
    5. Innovations: gaming, second life, virtual – streak a plate, different tools (virtual grocery store). How effective is something like Facebook or Twitter? CSA international –ask the expert
    6. Identifying effective technologies in the classroom.
    7. Identifying effective technologies on the front line – taking the tools to the front lines.
    8. Group in terms of application.
    9. Retail PDG may want to co-sponsor the symposium.
2. An idea for next year... marketing, instructions on food products, what makes consumers more likely to change their behavior.

#### **Recommendations to Executive Board:**

1. We wish for the Board to appoint Ben Chapman as PDG Vice Chairperson.
2. Wikipedia project: We would like to request participation from other PDGs to assist with their content areas. We would like for each committee chair to ask if one or two people from that PDG would be willing to serve as a liaison for the wiki project... really a subcommittee. These individuals will be involved in the conference call that we would set up in a couple of months.

3. We wish to suggest to the Board that whenever a rapid response symposium is developed, the organizers try to incorporate some sort of educational opportunities into the program.
4. Workshop: We wish the Board's input on our idea to develop the Risk Communication Workshop into a grant proposal for the USDA Workshop/meetings grant program. It would be co-sponsored by IAFF to make it a stronger workshop. IAFF may be subcontracted to handle the organizational portion of the workshop?

**Next Meeting Date:** August 1, 2010, Anaheim California.

**Meeting Adjourned:** 11:00 a.m.

**Chairperson:** Renee R. Boyer.

### **Fruit and Vegetable Safety and Quality PDG**

**Members Present:** Alex Castillo, Jack Guzewish, Stan Bailey, LeeAnn Jaykus, Bassam Annous, Elizabeth Bihn, Phillip Blagoyevich, Fred Breidt, Michael Cooley, Willette Crawford, Carol D'Lima, Michelle Danyluk, Phillip Elliott, Robert Elliott, Thomas Schwarz, Manan Sharma, Michelle Smith, Trevor Suslow, Agnes Tan, Thomas Taylor, George Tice, Mary Tortorello, Alvin Lee, Humberto Maldonado, Karl Matthews, Sherri McGarry, Maria Nazarowec-White, Xiangwu Nou, Jitu Patel, Suresh Pillai, Jena Roberts, Ofelia Rodriguez-Garcia, David Rodriguez-Lazaro, Jeffrey Farber, Montserrat Iturriaga, Larry Kohl, Keith Lampel and Guodong Zhang.

**New Members Present:** Andrew Maccabe, Katija Morley, Mayra Marquez-Gonzalez, Paula Freitas, Todd Rossow, Amanda Tian, Bob Koeritzer, William Huntley, Lawrence Goodridge, Elena Enache, Laura Strawn and Julia Perez.

**Visitors/Guests Present:** Paudepinder Bras and Rachel McEgan.

**Meeting Called to Order:** 9:02 a.m., Sunday, July 12, 2009.

**Recording Secretary of Minutes:** Sherri McGarry.

**Old Business:** Sign-in sheets were passed around and then the agenda was read and subject to approval. The committee voted to approve the Agenda.

Lee-Ann Jaykus spoke on behalf of IAFF Executive Board and staff, thanked the PDG for their efforts and support and notified about the changes in symposium guidelines. Deadline for submitting symposia is Oct. 19, 2009 and can be uploaded onto the IAFF Web site.

The antitrust guidelines for committee meetings were reviewed and then the meeting advanced to new business.

**New Business:** As every year, Jack Guzewish gave a report on outbreaks linked to produce between IAFF 2008 and IAFF 2009. He reported that 10 outbreaks had occurred as follows: 4 outbreaks of *Salmonella* illness linked to sprouts, 3 of *E. coli* O157:H7 linked to lettuce (2) and spinach (1), 1 of *Salmonella* Carrau linked to cut melons, 1 of *Salmonella* Rissen linked to white pepper, and 1 of *Cyclospora* linked to raspberries and blackberries.

Next item in the agenda was Regulatory Updates. Michelle Smith indicated that sprouts were an important commodity from a regulatory view point. Linked to many outbreak over the years. Because of the number of outbreaks and their unique process, sprouts are fresh produce but a unique category. FDA asked the Sprout Association to have a technical day focused on food safety issues during their meeting; FDA presented observations on implementation of sprout guidance. A number of firms do not follow the guidance appropriately. A new task force may be forming and will cover research but also review of how implementation can be encouraged, what the challenges are and what changes should

be made. Questions were made during this discussion related to seed certification, how this might be part of the regulation.

Another topic within produce regulation was the White House Food Safety Workgroup, there's much focus on preventive food safety and possible new regulations. There will be opportunity for comments. Also, FDA is working with the industry with regards to food safety of nuts, particularly regarding sanitation.

Next item was related to how the PDG could remain active and in contact during the year. IAFF can provide support for conference calls and webinars. The importance of having a sort of communication during the year that was of real benefit for participants was brought up. Not just meet to feel like we are meeting but to have a real benefit. Developing standard methodology for horticultural products (protocols, more standard access) was suggested as a topic for a conference call, webinar or e-mail exchange and was welcome by the committee. Also, discussions about FDA guidance was suggested as another topic.

Next item was about developing symposia for IAFF 2010. The topics that were more strongly supported were food safety of nuts, industry's success stories resulting from an outbreak, water quality issues, particularly irrigation/production side. Also, a symposium beyond commodities was suggested, such as food safety initiatives and conflict with water conservation issues, and defining food safety standards, metrics, differences with industry versus government guidance, and science gaps. Another non-commodity oriented symposium proposed was Product Tracing. In the end, the discussion was narrowed down to food safety standards including water, nuts, which was recommended to be organized jointly with other PDGs. Also, a round table was suggested on water. Sue (last name not recorded) was in charge of contacting the chemical PDG and co-organize the symposium on nuts, and Trevor Suslow and Betsy Bihn were in charge of organizing the symposium and round table on standards and water.

#### Recommendations to the Executive Board:

1. Given these economic times, the recommendation was to try to find ways of reducing the cost of attendance to the meeting, since this year was especially difficult to bring students who greatly benefit from this meeting.

**Next Meeting Date:** IAFF 2010.

**Meeting Adjourned:** 10:50 a.m.

#### International Food Protection Issues PDG

**Members Present:** Jeff Farber (Chair), Isabel Walls (Board Liaison), Andy Benson, Bob Buchanan, Leon Gorris, Jack Guzewich, Craig Harris, Ian Jensen, Kathy Lawlor, Linda Leake, Jenny Scott, Cindy Stewart and Ewen Todd.

**New Members:** Cristina Tirado, Judy Greig and Amanda Tian.

**Visitors/Guests Present:** Mike Cassidy, David Rasmussen, Craig Henry, John Allan, Lee-Ann Jaykus and Marilyn Lee.

**Meeting Called to Order:** 2:10 p.m., Saturday, July 11, 2009.

**Recording Secretary of Minutes:** Isabel Walls.

**Old Business:** None.

**New Business:** PDG agreed to write framework document based on 3 presentations. Symposia will be developed based on framework document. Future symposia could include role of food safety in food security (GB recommendations), role of private standards vs Codex standards, risk communication, monitoring and review of compliance with food safety control systems, and impact of cultural and socio-economic issues on food safety.

#### Recommendations to Executive Board:

1. Leon Gorris was elected Vice Chair.
2. Support for conference calls, webinars or other forms of communication with global members.
3. Support for a white paper or a framework document on "Components of an Effective Food Safety System" – for FPT and other outlets. (There may be different versions for different audiences.)

**Next Meeting Date:** Conference call in September 2009.

**Meeting Adjourned:** 5:00 p.m.

**Chairperson:** Jeff Farber.

#### Meat and Poultry Safety and Quality PDG

**Members Present:** Timothy Freier (Chair), Todd Bacon, David Baker, Safa Birbari, Peter Bodnaruk, Dennis Burson, John Butts, Roger Cook, Paula Fedorka-Cray, Laura Fenton, Kathleen Glass, Joshua Gurtler, Margaret Hardin, Craig Henry, Randy Huffman, Ian Jenson, Vijay Juneja, Yale Lary, Linda Leake, Yanbin Lee, John Marcy, Lynn McMullen, Marin Pavlic, Mark Pratt, Justin Ransom, Biran Sheldon, John Sofos, Harshavardhan Thippareddi and Patricia Wester.

**New Members Present:** Yuhuan Chen, Jim Dickson, Sun Kim, Elena Enache, Tami Wood, John Duke, Randy Huffman, Takateru Ishimori, Naoki Shinoda, Zhinong Yan, Kerri Harris, Robert Salter, Hong Wang, Jena Roberts, Rajesh Nayak, Maria Teresa Destro, Rudy Mendoza and Randall Phebus.

**Visitors/Guests Present:** John Bassett and Steve Tracy.

**Meeting Called to Order:** 2:00 p.m., Saturday, July 12, 2009.

**Recording Secretary of Minutes:** Craig Henry.

**Old Business:** Discussed symposia that were proposed and accepted at the last meeting.

**New Business:** The Chair asked for volunteers for the Vice Chairperson position. Craig Henry from GMA volunteered and the committee accepted. The committee agreed that webinars should be utilized and supported by IAFF.

Recommended Topics for 2010 Symposia and/or Webinars:

1. Sodium reduction – Kathy Glass.
  - a. Consider the new dietary guidelines and any reduction strategies proposed made by local, state or federal authorities as well as industry or consumer advocates.
  - b. The symposia/webinar should focus on the risk and benefits associated with a reduction strategy relevant to food safety.
  - c. Could also include new developments with sulfites and nitrites. It was noted that nitrites were addressed in a 2008 IAFF symposia.
2. New *Listeria monocytogenes* research – John Sofos and Harshavardhan Thippareddi.
  - a. Focused on risk assessments and interventions applicable at processing, retail and at point of consumption.
  - b. Discuss with the Retail PDG for collaborative effort and support.
  - c. This would be an overview of the outcomes of a multi-university CSREES grant.
3. New pathogen subtypes emerging in the supply chain and their relationship to ecological changes/interventions – Paula Fedorka-Cray.

- a. Consider pre-harvest control of *Salmonella* and other selected pathogens and ecological aspects. How does the environment and interventions select for more or less virulent strains.
4. Impact of COOL and pre-harvest control programs adopted by foreign suppliers exporting to the US – Linda Leake.
  - a. Global accountability, impact of 3rd party audits, etc.
5. Humane slaughter – impact on consumer perception and product quality.
  - a. Christine Bruhn – suggested speaker.
6. International expert panel review of the practicality of zero tolerance for *Salmonella* in poultry – Isabel Wall.
  - a. Ask Mike Doyle to present his findings from the international expert panel review of the practicality of zero tolerance for *Salmonella* in poultry.
  - b. Could also get the Codex perspective.
  - c. Consider how methods industry can employ to obtain zero *Salmonella* on par-cooked Not-Ready-to-Eat chicken products. New developments with *Clostridium difficile*.
7. Update on the new FSIS Public Health Based Inspection System (PHBIS).
  - a. Once the new Undersecretary for Food Safety is named and the National Advisory Committee on Meat and Poultry Inspection is named, consider public recommendations on managing PBHIS.
  - b. Consider the impact of pending legislation on Capital Hill potentially mandating new pathogen reduction performance standards.
  - c. *Campylobacter* is definitely on the list under PHBIS.

*Food Protection Trends* – Suggested.

1. Consider recent literature reviews conducted by Ph.D. candidates.
2. Consider giving an award for the best review.

**ACTION ITEM:** The Chair requested symposia/webinar/workshop organizers submit a title and brief abstract by the end of August 2009 and emailed to Tim Freier, Chair (tim\_freier@cargill.com) and Craig Henry, Vice Chair (chenry@maonline.org). The abstracts will be sent to the committee before a September 2009 conference call. The call will allow final decisions to be made on the committee's recommendations to IAFP for 2010 symposia/webinars/workshops.

**Recommendations to Executive Board:**

1. M&P PDG recommends that IAFP provide logistical support for conducting webinars. A participant fee could be charged to recover associated costs. Webex was noted as an efficient webinar provider and should be considered by IAFP especially when international participation and a recording are desired.
2. Election of Craig Henry, GMA, as Vice Chair.

**Next Meeting Date:** Conference call will occur in September, 2009.

**Meeting Adjourned:** 3:00 p.m.

**Chairperson:** Tim Freier.

**Microbial Modelling and Risk Analysis PDG**

**Members Present:** Mickey Parish (Co-Chair), David Baker, John Bassett, Yuhuan Chen, Vanessa Cranford, Paw Dalgaard, Kristen Dixon, Jeffrey Farber, Leon Gorris, Kenneth Janes, Vijay Juneja, Fumiko Kasuga, Tom Ross, Panagiotis Skandamis, Peter Snyder, John Sofos, Cindy Stewart, Katherine Swanson (Board Liaison), Ewen Todd, Erdal Tuncan, Richard Whiting and Marcel Zwietering.

**New Members Present:** Robert Buchanan, Juliana Ruzante, Aaron Uesugi, Scott Crerar, Bradley Marks, Naoki Shinoda, Fritz Lembke, William Northeimer, Patricia Rule, Niteen Sawant, Jim Dickson and Allen Saylor.

**Visitors/Guests Present:** Shirin Abd, Heather Craven, Atsushi Hasegawa and Hisato Ikemoto.

**Meeting Called to Order:** 9:02 a.m., Sunday, July 12, 2009.

**Recording Secretary of Minutes:** Leon Gorris.

Mickey Parish welcomed all attendees to the PDG meeting and passed on apologies of Co-Chair George-John Nychas and Vice Chair Deon Mahoney.

Katherine Swanson welcomed the participants on behalf of the IAFP Executive Board and reminded participants of the possibility to call on IAFP staff for support with teleconferences, webinars, PDG mailing/correspondence and issuing booklets/pamphlets from the PDG. The PDG members were encouraged to consider publications from the PDG in *Food Protection Trends*. It was noted that online submission for symposia and workshops will commence several weeks after the annual meeting with the following deadlines:

- 19 October, submission of symposia and workshops (ideally, all speakers identified and contacted).
- Mid-November, meeting of Program Committee.
- December, feedback from Program Committee regarding pre-selected symposia and workshops.
- February, submission of pre-selected symposia and workshops in final form.

**Old Business:**

- Minutes 2008 PDG Meeting. The meeting adopted the minutes as written.

**New Business:** Mickey Parish reminded attendees of various events of potential interest to the PDG:

- S1: ICMSF Symposium on International Developments in Food Safety.
- S10: International Food Protection Issues: Overview and Global Commodity Trade.
- S18: Looking for Thresholds: A Multi-disciplinary Key Events Approach.
- S21: Integrating Epidemiology and Microbiology to Solve Complex Food Safety Problems.
- S23: Systems Approach to Minimize *Escherichia coli* O157:H7 Food Safety Hazards Associated with Fresh and Fresh-cut Leafy Greens.
- S27: Focusing Our Efforts: Vulnerability Assessment and Mitigations Research in Food Processing and Handling Default.
- P2: Risk Assessment, Novel Laboratory Methods, Toxicology, Beverages and Water, Sanitation, and Microbial Spoilage Poster Session.
- RT1: Public Health Decision Making.
- RT3: Measuring and Interpreting Food-handling Behavior and Its Impact on Policy.
- T7: Risk Assessment, Spoilage and Beverages and Water Technical Session

The following future symposia are noteworthy for the PDG:

- 6th International Conference on Predictive Modeling in Foods – September 8th through 12th, 2009, Washington, D.C., USA. Web site: <http://www.6icpmf.org/>.
- IAFP 5th European Symposium, Oct. 7–9, 2009 in Berlin (7 Oct.: Combase workshop).
- IAFP Asia Pacific Symposium, Nov. 11–13, 2009 in Seoul.

The PDG will be informed of possible offers from contenders for hosting 7th ICPMF: Dublin, Copenhagen (contact: Paw Dalgaard), Budapest (contact: Jozsef Baranyi). More discussion on this at 6th ICPMF.

Leon Gorris suggested that IAFP staff may be able to support communication from PDG members to the PDG community, i.e. on future ICPMF meetings or ideas for symposia and workshops. Certainly when symposia and workshops would involve other PDGs, such support would make communication more effective for members and involve a larger group of people.

Discussion regarding ideas for symposia, workshops and other PDG activities:

- John Bassett raised the need to team up with other PDGs to blend in risk-analysis approaches in managing food safety aspects in scope of other PDGs. Pete Snyder suggested that the Retail Food Safety & Quality PDG might be interested in an opportunity to collaborate.
- Fumiko Kasuga suggested that she and Aamir Fazil could develop a symposium to inform IAFP members of the activities of the WHO group FERG (Food Epidemiology Reference Group) and that such a symposium could be a means for FERG to get input from food safety professionals on their work. The work involves burden of foodborne illness modelling.
- Leon Gorris put forward the idea to bring together a symposium on Bayesian Belief Modelling meant to paint the state of the art in science and application. Panagiotis Skandamis suggested featuring work from the TRACER project in this.
- Jeff Farber suggested a symposium on international aspects of food safety decision making. Katie Swanson suggested including Risk Communication in this. This could be a topic to develop with the International Issues PDG. It could possibly involve "instant decision making" on risk assessments as put forth by John Bassett.
- Niteen Sawant offered the idea to develop a symposium on "acceptable risk". Leon Gorris proposed that this would not focus on answers, but rather on the processes possibly followed and experiences in establishing acceptable risks.
- Yuhuan Chen raised the possibility of staging a symposium on predictive modelling related to low moisture matrix foods. Allen Tayler suggested that the Dairy PDG might be interested in this as well.
- Allen Saylor asked for the possibility for symposium or workshop giving an update on international developments in food safety management. John Bassett suggested that this could include work of ILSI Europe on this topic. A workshop was held at IAFP 2008 and there could be a repeat of that in future (involved: Tom Ross, Ewen Todd, Dick Whiting and Leon Gorris).

Patricia Rule suggested that a webinar could be held at some point in between annual meetings. Vanessa Cranford suggested Predictive Modelling and Microbiological Risk assessment as general awareness topics. Experts could address topics in ~15 min each and answer questions. Aimed at a relatively lay audience.

#### Recommendations to Executive Board:

1. To provide immediate guidance on the process for online submission of symposia and workshops (via bulletin? conference call?) to the IAFP membership (not just PDGs).
2. To support the PDG staging a webinar (possibly spring 2010). Topics selected to provide awareness of IAFP membership on Predictive Modelling and Microbiological Risk Assessment.

**Next Meeting Date:** August 1, 2010, Anaheim, California.

**Meeting Adjourned:** 10:00 a.m.

**Chairperson:** Mickey Parish.

#### Retail Food Safety and Quality PDG

**Members Present:** Veneranda Gapud (Chair), Ann Marie McNamara (Vice Chair), Philip Blagoyevich, Zeb Blanton, Jr., Margaret Burton, Jinru Chen, Rocelle Clavero, Carl Custer, Ken Davenport, Alfred Fain, Thomas Ford, Theresa Graham, Vijay Juneja, Larry Kohl, Bobby Krishna, John Marcy, Paul Marra, Eric Martin, Thomas McCaskey, Brian Nummer, Kathleen O'Donnell, Suresh Pillai, Kathleen Rajokowski, Fred Reimers, Jena Roberts, Todd Rossow, Mary Sandford, Amarat Simonne, O. Pete Snyder, Gloria Swick-Brown, Steve Tracey and Sharon Wood.

**New Members Present:** Peter Hibbard, Patricia Wester, Don Schaffner, Yanbin Li, David Rasmussen, David Baker, Christina Wilson, Kathleen O'Donnell, Brian Turner, Tori Stivers, Yuhuan Chen, Elena Enache, Don Lane, Rebecca Vigue, Stelios Viazis, Matthew Jenkins, Tim Gregg, Aaron Uesugi, Shirin Abd, Nurliza Buyong, Amanda Tian, Takateru Ishimori, Linda Gilardi, Rudy Mendoza and Kristin Boncaro.

**Visitors/Guest Present:** None.

**Board Liaison Present:** Katie Swanson.

**Meeting Called to Order:** 10:03 a.m., Sunday, July 12, 2009.

**Recording Secretary of Minutes:** Ann Marie McNamara.

**Old Business:** Chairperson Veny Gapud called the meeting to order and welcomed new and old members to the Retail Food Safety and Quality PDG. The individuals present stated their names and affiliations. Veny read the anti-trust guidelines to attendees and urged them to strictly comply. Veny read the minutes of the last meeting and the minutes were approved as written by PDG members. Veny reminded PDG members of the 3 roundtables/symposia being presented and urged members to attend. Ann Marie McNamara, Vice-Chair, recognized and thanked IAFP for providing free, temporary badges to associates participating in the roundtable.

**New Business:** Katie Swanson welcomed the members on behalf of the Executive Board and praised the work of the PDG. She listed some key services offered to PDG members, such as mailings, booklets, pamphlets and webinars. She encouraged submissions to *Food Protection Trends* based on the symposia being offered. Both Veny and Katie discussed the changes to the deadlines for symposia submission. Veny stated that since members were already present we would discuss and preliminarily develop symposia for next year. Pete Snyder updated us on his idea for a research clearinghouse of IFT/IAFP members. Don Schaffner also proposed a similar topic for a symposium entitled: Prioritizing research needs in retail/ food service food safety. Sharon Wood proposed a symposium called: Contemporary issues in retail, food service and grocery: Best practices and practical models. A third symposium was suggested

by Larry Kohl based on recent outbreaks, but was tabled when members could not work out the logistics of such a presentation. A fourth symposium entitled: "Science based retail process HACCP validation" was proposed by Pete Snyder.

#### Recommendations to the Executive Board:

1. Ann Marie McNamara raised the issue of rotating the PDG meeting times among PDGs from Sunday morning, noon, and afternoon to be equitable to all parties. For example, the Retail PDG always has the morning time slot necessitating extra hotel and meal expenses for Saturday travel that other PDGs do not incur if they can fly in Sunday morning. Rotating time slots provides fairness for all.
2. Carl Custer asked that the page charges for *Journal of Food Protection* be dropped to encourage submissions.
3. Sharon Wood praised the work of Tamara Ford in assisting with the logistics of the roundtable.
4. Sharon Wood was elected Vice-Chair for 2010 and 2011.
5. Ann Marie McNamara was introduced as Chair for 2010 and 2011.

**Next Meeting Date:** July 31, 2010 in Anaheim, CA.

**Meeting Adjourned:** 12:05 p.m.

**Chairperson:** Veny Gapud.

### Seafood Safety and Quality PDG

**Members Present:** Kathleen T. Rajkowski (Chair), Katherine Swanson (Board Liaison), Barbara Blakistone, Angelo DePaola, Alfred Fain, Veneranda Gapud, Beilei Ge, Peter Hibbard, Marlene Janes, William Schwartz, Tori Stivers and Pamela Tom.

**New Members:** Amanda Tian, Kevin Edwards, Kristin Boncaro, Robert Salter and Jamie Morrison.

**Visitors/Guests Present:** Nicole Hazard, Eric Martin, Peter Kennedy and Dean Davidson.

**Meeting Called to Order:** 1:03 p.m., July 12, 2009.

**Recording Secretary of Minutes:** Pam Thomas.

Call to order and introductions

- Called to order by Kathleen Rajkowski.
- Katie Swanson was introduced, welcomed the attendees and discussed the new symposium submission timeline for PDGs. 1,800 attendance is expected for 2009 IAFP meeting.

Welcome new committee members and visitors.

Chair introduced Chairs of other PDGs interested in Seafood quality:

- Veny Gapud, Chair of Retail PDG
- Dean Davidson, Chair of Water Quality PDG
- Peter Kennedy, Vice-Chair of Water Quality PDG

Check sign-in sheet for current members circulate

New member/visitor sign-in sheet circulated.

Appointment of recording secretary – Pamela Tom.

Selection of Vice Chairperson – Veny Gapud – Popeyes Chicken.

#### Old Business:

Andy – our lab methods workshop proposal was not accepted for the 2009 meeting. Kathleen we will resubmit and it will be stronger and more succinct: Water, soil, transportation, finfish (catfish), fish feed, and retail applications.

Andy – this is the one venue that could take on internationally seafood. Instead of going to the same old speakers, try to involve people who are not IAFP members. Not a critical mass of seafood

here. Could IAFP link with other organizations so that they could help introduce each other's meetings? Ultimately, need to bring in stronger programs. Seafood cross-cuts into water.

Kathleen, no one knows about contamination, regulatory, research that has and has not been done for imported seafood (finfish and crustaceans).

Minutes from 2008 Committee meeting – Correction – Time of adjournment was 2:30 p.m. Motion made by Marlene Janes, seconded by Al Fain. Corrected minutes unanimously approved.

#### New Business:

Kathleen – Open to the floor for suggestions, feedback, discussion as follows:

Attendees discussed the format of the workshop and there were many suggestions as how to proceed with development of the workshop. Points covered: may need a lab for the workshop is sample prep not done beforehand; have more interactions among the groups and content that you can bring home; include other PDG for input to workshop – methods for chemical residues and method for water safety; advertise workshop to academia, industry and government – try for the global audience.

#### Conclusion of Discussion:

Workshop Rewrite –

1. Andy – will talk to people to see if there is still interest
2. Marlane – rework the methods workshop
3. Tim
4. Bei Le
5. Kathleen

Roundtable – possibly two.

6. Auditing
7. Imported Seafood – short symposium with a roundtable
  - a. Barbara
  - b. Veny
8. Kevin Edwards – wants someone from Thailand to speak

#### Recommendations to Executive Board:

1. Elected as Vice-Chair: Veny Gapud of Popeyes Chicken.
2. Better communication with students to attend PDG meetings.

**Next Meeting Date:** Conference call scheduled for August and September, 2009.

**Meeting Adjourned:** 2:55 p.m.

**Chairperson:** Kathleen Rajkowski.

### Student PDG

#### Luncheon Meeting:

**Members Present:** Kirsten Hirneisen (Chair), Laura Strawn (Vice Chair), Lenese Grant (Secretary), Rachel McEgan (Treasurer), Stephen Grove, Reshani Senevirathne, Aaron Uesugi, Amrita Pathania, Alejandro Echeverry, Provene Sunkara, Jeremy Adler, Brita Ball and Hudaa Neetoo.

**New Members Present:** Gashaw Mersha, Chayapa Techathuvanan, Linda Ho, Senaka Ranadheera, Emeta Monu, Sonja Jones, Jamie Morrison, Ho Phang, Susaune Keller, Roxanne Vontayson, Tom Kuntz, Govindaraj Dev Kumar, Amit Morey, Boon-Fei Tan, Simmon Hofstetter, Minto Michael, Vaibhav Ahirrao, Ansen Pond, Evan Chaney, Andrea Dow, Yen Te Liao, Dominic Bagenda, Alex Brandt, Patrick Mester, Stelios Viazis, Adrienne Shearer, Mythili Kotapalli, Kinga Szlachta, Xueyan Liu, Liao Wang, Lei Wang, Jeremy Chenu, Anne Wilcock and Pardeepinder Brar.

**Visitors/Guests Present:** Atul Meuta, Peter Slade, Richelle Beverly, Manan Sharma, Bennett Armstrong, Linda Leake, Ben Chapman, Renee Boyer, Michelle Danyluk, Gordon Hayburn, Cangliang Shen and Sarah Markland.

**Board Members Present:** Stan Bailey, Katie Swanson, Roger Cook and Lee-Ann Jaykus.

**Meeting Called to Order:** 12:16 p.m., Sunday, July 12, 2009.

**Recording Secretary of Minutes:** Lenese Grant.

**Old Business:** Introduction of outgoing officers, Chair: Hudaa Neetoo, Secretary: Jessica Butler, Treasurer: Diego Paiva.

**New Business:** Kirsten did a brief outline of student luncheon. Introduction of incoming officers, Chair: Kirsten Hirneisen, Vice Chair: Laura Strawn, Secretary: Lenese Grant, Treasurer: Rachael McEgan. The 2009 SPDG t-shirts were presented. Kirsten also spoke briefly about job postings, session monitoring, the student mixer, Tuesday, July 14, 2009, 7:00 p.m. – 9:00 p.m. and the student symposium, Wednesday, July 15, 2009, 1:30 p.m. – 3:30 p.m.

President Stan Bailey welcomed everyone to the luncheon and introduced the Executive Board of IAFF. The speaker was Stephen F. Grove, Ph.D. The topic of his talk was "Maybe I should do a Ph.D. after all."

**Recommendations to Executive Board:** None.

**Next Meeting Date:** August 2010.

**Meeting Adjourned:** 1:32 p.m.

**Chairperson:** Kirsten Hirneisen

#### **Business Meeting:**

**Members Present:** Kirsten Hirneisen (Chair), Laura Strawn (Vice Chair), Lenese Grant (Secretary), Rachel McEgan (Treasurer), Jeremy Adler, Resham Seneviratne, Angela Laury, Ravi Jadeja, Jie Wei, Hudaa Neetoo, Amrita Pathania, Diego Paiva and Jessica Butler.

**New Members Present:** Senaka Ranadheera, Pardeepinder Brar, Armitra Jackson, Sonja Jones, Danielle Perkin, Cangliang Shen, Amit Morey, Roxanne VonTayson and Govindaraj Dev Kumar.

**Visitor Present:** Sarah Markland.

**Meeting Called to Order:** 1:34 p.m., Saturday, July 12, 2009.

**Recording Secretary of Minutes:** Lenese Grant.

**Old Business:** None.

**New Business:** Dr. Jaykus spoke briefly about new guidelines that govern the development of a symposium. The guidelines include the following: (1) Forms are online and are due October 19, 2009; (2) Identify topic and describe it well, (3) Identify type of speech and speakers, (4) December 4, 2009 receive notification on proposal, (5) Final copy is due February 3, 2010. The types of symposia include the following: (1) Full: 6 persons, 25 minutes each, (2) Abbreviated: 3 persons, 25 minutes each, (3) Roundtable. Another idea included a "mock outbreak."

Dr. Jaykus opened the floor for discussion of symposia ideas. The first idea was primarily about third party certification including the new certification program Walmart has implemented known as SQF (safe quality food). This would be a roundtable discussion and may include a person from the USDA, the European Union, a large food company, a small food company, a person from a academic extension and a person who works for a third party certification system.

The second idea primarily included consumer education and how to combat the inaccuracy of food safety issues associated with the media. This talk may include persons from PETA or FSIS. Other topics that were raised included the following: (1) Sustainable agriculture and what it has to do with food safety, (2) International trade, (3) Organic vs. Non-Organic. Students divided into two groups and discussed topics more in-depth.

#### **Recommendations to Executive Board:**

1. The executive board was advised to execute an idea as soon as possible because planning a symposium can be tedious.

**Next Meeting Date:** August 2010.

**Meeting Adjourned:** 2:30 p.m.

**Chairperson:** Kirsten Hirneisen.

### **Viral and Parasitic Foodborne Disease PDG**

**Members Present:** Doris D'Souza (chairing session), Lee-Ann Jaykus (Board Liaison), Trinetta Worthington (Staff Liaison), Stephen Grove, Efstathia Papafragkou, Julie Jean, Judy Greig and Suresh Pillai.

**New Members Present:** Marlene Janes, Larry Cohen, Jie Wei, Jennifer Cannon, Julie Kase and Rebecca Vigue.

**Visitors/Guests Present:** Marilyn Lee and Diane Stewart.

**Meeting Called to Order:** 9:10 a.m., Sunday, July 12, 2009.

**Recording Secretary of Minutes:** Stephen Grove.

**Old Business:** The PDG members and visitors were welcomed to the meeting and introduced. Each member and visitor signed the rosters. The attendees were reminded about attending the symposium organized by the PDG on Monday morning at 10:30 a.m. in Grapevine 1-2 entitled "Epidemiological Trends of Noroviruses". Previous year's foodborne virus associated events were discussed such as the COST929 Symposium held in Pisa, Italy, October 2008 and the 2008 European IAFF Symposium held in Lisbon, Portugal.

**New Business:** Current year's foodborne virus-related events including the 2009 European IAFF Symposium to be held in Berlin, Germany and the Asia Pacific Symposium to be held in Seoul, Korea, 2009 were discussed. Lee-Ann Jaykus (Board Liaison) encouraged the PDG to submit symposia and also updated the PDG about the new deadlines for symposia and workshop submission that is October 19, 2009. She encouraged members to actively participate in the PDG and submit manuscripts to *Food Protection Trends*. Symposia ideas were brainstormed and discussed. A symposium idea was put forth by Marlene Janes, Larry Cohen and Stephen Grove entitled "Sanitation Approaches from the Farm to Fork for Foodborne Viral Control" to include updates on sanitation measures used at the farm, at the producer level, at retail and foodservice, and at the household and consumer levels. Various issues regarding regulation of sanitizer use and antiviral claims were also discussed. Lee-Ann Jaykus also suggested a short symposium topic "Food Attribution of Noroviruses" to include speakers from the USA, Europe and Canada. Marlene Janes, Larry Cohen, Stephen Grove, and Doris D'Souza will help organize these symposia. Suggested speakers and their presentation topics were discussed. Conference calls will be organized by Mid-August, and in Mid-September, and Mid-October to finalize the symposia proposal and abstract preparation. A white paper on our PDG's previous

IAFP 2008 and IAFP 2009 Symposium will be worked on as a collaborative effort within our PDG. Another paper suggested by Jennifer Cannon and Stephen Grove included the effectiveness of current inactivation methods by sanitizers that could be developed by our PDG as a collaborative project between various labs. Jennifer Cannon also suggested and will help update the website with a food-tube to share challenges associated with developmental methods or other research issues. She also discussed worker contamination issues at the farm level versus in food-service establishments. Other issues discussed included the challenges faced in detection technology from food samples for human enteric viruses. Suresh Pillai discussed the ability to detect bacteriophages from food samples at retail but the inability to detect human enteric viruses from these samples. Detection sensitivity issues and issues related to viral outbreaks were discussed. Larry Cohen discussed addressing issues with virus control in HACCP plans and validation of kill-step methods in the processing plants. Marlene Janes was nominated as the incoming vice-chair for the PDG and this recommendation will be put forth to the Board. New membership to IAFP and our PDG was encouraged.

**Recommendations to Executive Board:**

1. To elect Marlene Janes as the Vice Chair.

**Next Meeting Date:** August 1, 2010.

**Meeting Adjourned:** 10:45 a.m.

**Chairperson:** Doris D'Souza, Past Chair.

**Water Safety and Quality PDG**

**Members Present:** Dean Davidson (Chair), Vickie Lewandowski (Board Liaison), Trinetta Worthington (Staff Liaison), Michael H. Brodsky, Larry Cohen, Louise M. Fielding, Peter Kennedy, Susan McKnight, Suresh D. Pillai and Kathleen Rajkowski.

**New Members Present:** Robert Salter, DeAnn Benesh, Robert Donofrio, Dorothy Wrigley, Joseph Odumeru, William Northeimer and Phyllis Posy.

**Visitors/Guests Present:** Patrick Mach and Charles Young.

**Meeting Called to Order:** 9:00 a.m., Sunday, July 12, 2009.

**Recording Secretary of Minutes:** Dean Davidson.

**Old Business:** Reviewed the June 2009 conference call.

**New Business:** PDG discussed several topics for symposia and roundtable discussions. Because water safety and quality is a cross cutting issue among many other PDGs we would conduct outreach prior to submitting symposia and roundtables. We agreed to work with the Seafood Safety PDG on a workshop planned for 2010. We would participate in the revision of the Procedures to Investigate Waterborne Illness. We responded affirmatively to the Board request to submit articles for *Food Protection Trends*. After the Chairman's PDG conference call we agreed to a follow up conference call to refine the proposed symposia and roundtable topics discussed during the meeting in late August or early September 2009.

**Recommendations to Executive Board:**

1. Susan McKnight was elected Vice Chair.
2. Support for conference calls, webinars or other forms of communication with global members.

**Next Meeting Date:** Conference call September 2009.

**Meeting Adjourned:** 11:00 a.m.

**Chairperson:** Dean C. Davidson.

# ***Congratulations...***

At IAFP 2009, we offered a drawing for a one-year membership with our Association. We are pleased to announce the following winner of the drawing.

**IAFP Membership**

Lauren Jung  
Victoria, British Columbia, Canada



# AFFILIATE COUNCIL MINUTES

IAFP 2009 – Sunday, July 12, 2009

Grapevine, Texas

## AFFILIATES PRESENT:

### North America

Arkansas	Steve Ricke
Alabama	Tom McCaskey
Alberta	Lynn McMullen
Associated Illinois	Dennis Gaalswyk
Carolina	Steve Tracey
California	John Bruhn
Capital Area	Jenny Scott
Florida	Peter Hibbard
Georgia	Tori Stivers
Indiana	Helene Uhlman
Metropolitan	Don Schaffner
Michigan	Lynne Madison
New York	Steve Murphy
Ohio	Gloria Swick-Brown
Ontario	Michael Cassidy
Pennsylvania	Eugene Frey
Southern California	Margaret Burton
Texas	Fred Reimers
Upper Midwest	Dan Erickson
Washington	Stephanie Olmsted
Wisconsin	Randy Daggs

### International

Australia	Ian Jenson (with apologies from Deon Mahoney)
Brazil	Maria Teresa Destro
Colombia	Jairo Romero
Dubai	Bobby Krishna
New Zealand	Roger Cook
Portugal	Laurentina Pedrosa
United Kingdom	David Lloyd

**Board Members and IAFP Staff Present:** Gary Acuff, Stan Bailey, Vickie Lewandowski, Lee-Ann Jaykus, Isabel Walls, Katie Swanson, David Tharp, Lisa Hovey and Leilani McDonald.

**Visitors/Guests Present:** Elaine De Martinis, Brazil; Christina Wilson, Ohio; Judy Greig, Ontario; Eric Martin, Zeb Blanton, and Kristin Boncaro, Florida; Joseph Odumeru, Ontario; Bruce Steege, Minnesota and Carl Custer, Capital Area.

**Meeting Called to Order:** 7:08 a.m., Sunday, July 12, 2009.

**Recording Secretary of Minutes:** Dan Erickson.

**Call to Order:** The meeting was called to order at 7:08 a.m. by Affiliate Council Chair Roger Cook. There were 48 members and guests present. The agenda was approved with two items added to new business. (So moved and seconded.)

**Report from Affiliate Council Chairperson:** Roger Cook announced and acknowledged the 2009 Affiliate Award winners, and announced new Affiliates from Arkansas, Colombia and Hungary. He individually acknowledged those Affiliates whose accomplishments earned them high rankings in the selection process, noting that the jury choice was difficult due to the overall high caliber of submissions. He noted the receipt of 35 Annual Reports for 2008 and congratulated Affiliates for their extensive preparation and concise reporting. He thanked Leilani McDonald, Affiliate Staff Liaison, for her exceptional work with Affiliate Council administration and the *Affiliate View*, and expressed gratitude for her "rock solid" support through a trying year. Roger also expressed gratitude to Dan Erickson, Affiliate Council Secretary, for standing in for missed Executive Board meetings due to injuries suffered in a terrible ski accident late last year; and to the Affiliates for their support and fellowship during his recovery.

**Report from IAFP President:** Stan Bailey presented the 2009 President's report highlighting the IAFP activities of the past year, and was thanked for his detailed report. Affiliate Council members were invited to ask questions concerning activities of Board actions and details involved with the launch of the IAFP Press.

**Report from the IAFP Office:** David Tharp, Executive Director, presented the 2009 Office report.

**Report from the IAFP Affiliate Liaison Staff:** Leilani McDonald also thanked Affiliates for their Annual Reports, noting that she had received 35 for 43 Affiliates (81%). Leilani pointed to many activities regarding IAFP's support of Affiliates:

1. **Affiliate Membership Promotion.** Affiliate Membership is being encouraged through advertising in *FPT*. A special postcard-size advertisement, available at the Affiliate booth, is also now provided as an insert in the IAFP Membership marketing brochure. The Executive Director's article in July 2009 *FPT* also encouraged Affiliate membership.
2. **Monday "Speed Meeting."** Tables have been designated for Affiliate discussions to take place during the Monday lunch break in the Exhibit Hall.
3. **Affiliate Annual Reports to IAFP.** The Annual Report deadline is for those Affiliates wishing to be considered for one of the five Affiliate Awards. The Reports, which are a requirement of affiliation, may also be filed past the deadline. When submitting the Report, please be reminded to provide the original and three copies for jury review. If filing electronically, IAFP will copy for the jury a maximum of 10 pages of photos/attachments beyond the base report pages. Affiliates seeking the highest quality visual presentation should send four bound copies by mail (one is retained by the IAFP office). In the spirit of "going green," simple yet thorough submissions are encouraged.
4. **Affiliate Meeting Support from IAFP.** IAFP's provision of support materials for Affiliate meetings will be simplified. When offering the materials, Leilani and the meeting contact will determine the type and quantity

to be provided. Note that IAFP's journals, Membership brochures, Annual Meeting brochures, and the Membership certificate are standard provisions. Affiliates will also be offered the IAFP PowerPoint slide show used by the Executive Board Speaker program. This slide show is updated yearly following the IAFP Annual Meeting.

**Election of the Affiliate Council Secretary:** Roger Cook announced that David Lloyd of the United Kingdom Association for Food Protection received the sole nomination for Affiliate Council Secretary. (So moved and seconded.) David Lloyd was voted by acclamation.

**New Business:**

1. **Affiliate Networking Events.** Discussion included this year's "Speed Meeting" during Monday lunch and a proposed "Affiliate networking room" for IAFP 2010 and beyond. Provision of a networking room would encourage large Affiliate gatherings and technical presentations on business tools, etc.
2. **FAQs for Affiliates.** A frequently asked question (FAQ) section is to be developed for the Affiliate Web pages on the IAFP Web site. Leilani will work with the Chair, Secretary, Past Chair and willing Delegates to coordinate this task.
3. **Table Themes for the Awards Banquet.** Affiliates are encouraged to develop themes for their tables at the annual Awards Banquet, but this would be an informal project.
4. **Status of Established Affiliate Organizations.** New Affiliates from Arkansas, Hungary, and Colombia were welcomed. The Tennessee and Mississippi Affiliates have

been removed from the list of recognized Affiliates during IAFP Board action earlier in the year, due to lapsed activity and communication with their representatives.

5. **Affiliate Educational Symposium.** A discussion of future educational symposia was discussed with no action taken. Sharing information through the *Affiliate View*, speed-meeting tables and proposed networking room were considered sufficient given the tight time schedule at the conference.

**Affiliate Reports:** Delegates offered a summary of their Affiliate's activities and accomplishments in the past year.

**Recommendations to the Executive Board:**

1. That the Board support provision of an Affiliate Networking room at future meetings in which Affiliates can meet to discuss and formally present technical information and business management tools to assist with Affiliate development or expansion.
2. Establish a "FAQ" section on Affiliate Web page of the IAFP Web site.
3. Acknowledge the election of David Lloyd, Affiliate Delegate from the UKAFP, as incoming Secretary of the Affiliate Council.

**Passing of the Gavel:** Chairperson Roger Cook passed the gavel to Dan Erickson, signifying the beginning of his term as Affiliate Council Chair.

**Next Meeting Date:** 7:00 a.m., Sunday, August 1, 2010, in Anaheim, California.

**Meeting Adjourned:** 9:48 a.m.

**Chairperson:** Roger Cook.

# RECOMMENDATIONS TO EXECUTIVE BOARD AS TAKEN FROM COMMITTEE MINUTES OF MEETINGS HELD IN GRAPEVINE, TEXAS

## Executive Board Response as Discussed at the Executive Board Meeting on July 16, 2009

### STANDING COMMITTEES

#### Food Protection Trends Management Committee

##### Recommendations to Executive Board:

1. Appoint a subcommittee to develop a survey determining directions for *FPT*, for distribution to the IAFF membership. Members of the Subcommittee are Julian Cox (Chair), Kristina Barlow, Richelle Beverly, Benjamin Chapman, Beth Ann Crozier-Dodson, Michelle Danyluk and Michael Musgrove.  
**Board Response:** Agreed and encourage quick work in this area.
2. Appoint a part-time "managing editor" to provide support for renovation of *FPT* and to drive provision of a range of articles, assisting with their preparation, for publication in *FPT*.  
**Board Response:** Staff will investigate budget considerations pending survey results mentioned in #1.
3. Modify the Instructions for Authors for *FPT* to make explicit the nature of plagiarism and penalties for cases of plagiarism, consistent with such modification made to the Instructions for *JFP*.  
**Board Response:** Agreed.
4. Michelle Danyluk was elected as Vice Chairperson of the Committee.  
**Board Response:** Agreed.

#### Journal of Food Protection Management Committee

##### Recommendations to Executive Board:

1. Reappoint Joseph Frank as Scientific Editor for another four-year term.  
**Board Response:** Agreed.
2. In implementing the "open access" policy recently approved by the Board, the Committee recommends that access be allowed 6 months after publication in *Journal of Food Protection*.  
**Board Response:** Agreed.
3. Appoint a subcommittee to survey members on their attitudes about modifying subscription rates, page charges, and feasibility of making *JFP* completely online. The sub-committee will consist of Mark Harrison, Kendra Nightingale and John Bassett.  
**Board Response:** Agreed and encourages quick work in this area.

4. The feasibility of distributing papers accepted for publication in *JFP* and/or the monthly table of contents to all IAFF members (not just subscribers) should be investigated. If feasible, then it is recommended the Board approve this recommendation for implementation.  
**Board Response:** Agreed.

### SPECIAL COMMITTEES

#### 3-A Committee on Sanitary Procedures

##### Recommendations to Executive Board:

1. Follow-up on promotion activities undertaken by 3-A SSI.  
**Board Response:** Agreed. Board requests that 3-A provide information suitable for publication so IAFF can further promote 3-A.
2. Consider printing a summary of new or revised 3-A Sanitary Standards and 3-A Accepted Practices. The title, scope, effective date, and a method of obtaining the revision should be included in the notification.  
**Board Response:** Agreed. IAFF will look to 3-A to supply this summary and is then willing to print in *FPT*.
3. Investigate the possibility of a data base for 3-A that could be used assessed by members of the Working Groups only and that could track upcoming ballots and eligible voters in real time.  
**Board Response:** This appears to better fit under the efforts of 3-A.

#### Audiovisual Library Committee

##### Recommendations to Executive Board:

1. To partner with IFT, NEHA, ASM, etc. to acquire DVDs for member usage.  
**Board Response:** Audiovisual Committee can consider adding DVDs from any source to the Audiovisual Library.
2. To look at putting DVDs and international meetings and symposia on flash drives to send out to members through the library.  
**Board Response:** Agreed. IAFF is considering adding limited presentations to its Web site for distribution in this manner.
3. Have a contest for membership to submit material to AV Library. Give a prize of \$100 for each item accepted for inclusion in the library.  
**Board Response:** The Board encourages new materials for inclusion in the Audiovisual Library but does not believe a contest will improve the submission rate.

4. Compare shipping charges for Post Office, UPS, and FED EX to see which is most cost effective for sending out materials.  
**Board Response:** Staff does this on each item sent.
5. Make the order form more readable and user friendly.  
**Board Response:** Staff will work to redesign the order form.
6. Check on site licenses. Do we have a site license for the training materials purchased for the library?  
**Board Response:** Staff will investigate this issue.
7. Review criteria for acceptance into the AV Library.  
**Board Response:** Agreed. This is a function of the Audiovisual Library Committee.
8. To consider access to public health databases for members.  
**Board Response:** Agreed. This is a function of the Audiovisual Library Committee.
9. Does our Web site have the capacity to host webinars, podcast, etc.?  
**Board Response:** Yes.
10. Question for the Board. Can library borrow money from membership committee to upgrade library and advertise it as a member benefit?  
**Board Response:** There are monies available to the Audiovisual Library (made available from the IAFF Foundation) for purchase of new materials.

#### Committee on Control of Foodborne Illness

##### Recommendations to Executive Board:

1. Procedures to Investigate Foodborne Illness to be completed by December 31, 2009.  
**Board Response:** Agreed.
2. CDC Diseases Transmitted by Foods will be revised and suggested that it be used in an Access database format for ease of searching. We recommend that funds be available for a student to prepare a draft for the Committee and CDC experts to review and approve.  
**Board Response:** Agreed. Before final approval, a proposed budget of total expenditure should be submitted for approval.
3. Three more foodworker papers in final draft form will be published in *JFP*. When the final paper, e.g., paper 9, is typeset for *JFP*, IAFF will have the complete set bound and available through IAFF for sale.  
**Board Response:** Agreed.
4. *Procedures to Investigate Waterborne Illness* will be initiated by the Committee in combination with the Water Safety and Quality PDG.  
**Board Response:** Agreed and encourage the revision of this manual.
5. All manuals in draft form should be available for work in electronic format.  
**Board Response:** Agreed. Staff is working to provide manuals in electronic format.
6. Frank Bryan completed a history of this Committee in 1999. Frank requested that the Committee add to this for a 100 year history in 2014. Committee agreed that this should be done with additions from current and future CCFI activities. The completed history should be published in *Food Protection Trends*.  
**Board Response:** Agreed. The Committee should work towards this goal of providing a 100 year Committee history.

7. Recommendation from NAFSS to create a document or manual on "How to respond to a foodborne disease crisis." The Committee agreed for NAFSS to draft an outline and explore other manuals to see what format would be useful. Recommend that the Board approve the potential collaboration with NAFSS.  
**Board Response:** Agreed. The Board approves working with NAFSS on this manual.
8. A number of symposia are being submitted electronically after a conference call in mid-August for approval by the Program Committee.  
**Board Response:** Agreed. The Program Committee will review submissions and reply directly to the submitter.
9. Recommend that there be a space on the IAFF Web site for CCFI activities including posting of presentations, symposia ppts/abstracts and educational and training materials derived from CCFI activities and publications.  
**Board Response:** Agreed. Each Committee holds a Web page on the IAFF Web site. Contact the IAFF office for posting of materials.

#### Constitution and Bylaws Committee

Recommendations to Executive Board: None.

#### Foundation Committee

Recommendations to Executive Board: None.

#### Membership Committee

##### Recommendations to Executive Board:

1. Two options on requiring IAFF membership of exhibitor booth attendees currently attending for free:
  - A. \$50 required IAFF membership for all exhibitor booth attendees, payable upon registration.
  - B. Grant exhibitors 3 free IAFF memberships; recoup membership cost through increased booth fee.

The committee requests that the staff review the options to determine the most effective way to move this forward and identify any issues that would make this option inappropriate.  
**Board Response:** The Board does not believe Membership should be "forced" on anyone (as in "A" above). Staff will investigate the possibility of adding Membership to those exhibitors not currently paying for Membership.
2. Board to recognize the following Membership Committee organization changes to begin their terms at IAFF 2010:  
New Chairperson: Donald Schaffner  
New Vice-Chair: Crispin Philpott  
**Board Response:** Agreed.
3. Two options for soliciting greater IAFF participation by Exhibitors:
  - A. Board to establish an Exhibitors' Committee to participate in meeting planning process
  - B. Membership Committee to establish an Exhibitors Subcommittee, or invite exhibitor participation on the membership committee, to promote dialogue.  
**Board Response:** The Board encourages exhibitor participation on the Membership Committee and on all Committee and PDGs.

4. The Membership Committee wishes to recognize the significant contributions of the IAFP Staff in facilitating the effectiveness of the Committee.

**Board Response:** Agreed.

### Nominating Committee

**Recommendations to Executive Board:** None.

### Past Presidents Committee

**Recommendations to Executive Board:**

1. Change meeting time to be conducted from 4:00 p.m. to 5:00 p.m. (on Saturday).

**Board Response:** Agreed.

## PROFESSIONAL DEVELOPMENT GROUPS

### Applied Laboratory Methods PDG

**Recommendations to Executive Board:**

1. Recommend the approval of Leslie Thompson as Vice Chair.  
**Board Response:** Agreed.
2. Recommend that the Board support webinars and educational sessions with adding features for multiple presenters, international call-in numbers, recordable features and attendance/roll of participants.  
**Board Response:** Agreed.
3. Recommend that the Board reserve a one-day meeting room on Saturday at the 2010 IAFP Annual Meeting for purpose of the Sample Prep Working Group.  
**Board Response:** Agreed.

### Beverage PDG

**Recommendations to Executive Board:**

1. Give weight to the availability of convenient laboratory space for potential wet work shops in decision for future meeting locations.  
**Board Response:** This can be considered with the primary focus on a meeting location and facility that meets the needs of the Annual Meeting. Proposals for workshops can also be structured around the locations selected.
2. Kathy Lawlor was elected Vice Chair.  
**Board Response:** Agreed.

### Dairy Quality and Safety PDG

**Recommendations to Executive Board:**

1. It is widely recognized that IAFP is an internationally-recognized food safety organization and as such, we are asking the Board to authorize Mr. David Tharp, as IAFP's primary representative, to sign onto letters intended to be sent to State Legislative committees during the December 2009 – June 2010 timeframe identifying risks related to the consumption of raw milk by humans.  
**Board Response:** IAFP has approved a position statement on consumption of raw milk but chooses not to engage in efforts that could be construed as lobbying. The Board encourages all individual Members to act on their own behalf in providing valuable input for discussions involving food safety issues.

2. Support ongoing efforts by the Raw Milk Subcommittee to:
  - Develop a mechanism for tracking raw milk state legislation from December 2009 – May 2010.
  - Identify lists of regional and national dairy safety expert teams that include nutritionists, medical doctors, dairy processors, dairy producers, dairy microbiologist, state and federal dairy regulators and parents of children that became ill from the consumption of raw milk.
  - Draft and finalize a laminated one-page factsheet on Raw Milk Quality and Safety for IAFP publication.
  - Coordinate with AVMA to develop a website containing factual and scientific information about the risks of raw milk consumption to offset the large number of websites containing mis-information that misleads consumers. Funding will be obtained from private sources.

**Board Response:** The Board encourages the PDG and Subcommittee members to pursue these efforts. When financial resources are needed from IAFP, a budget request should be made to the Board.

3. Support updating the IAFP Dairy Quality & Safety PDG Web page by outgoing Chair Lori Ledenbach to include factual information on the dairy industry, more details on PDG minutes, meetings, conference calls, and activities, an international dairy meetings and events calendar, etc.  
**Board Response:** Committees and PDGs may submit information for posting on their individual Committee or PDG Web page through one contact (normally the chair). This contact shall work with the IAFP office. Calendar events may be submitted directly to the IAFP calendar through the IAFP home page (can also be listed on the PDG Web page separately if submitted for posting).
4. Agree to publish a *Listeria* Control brochure (when completed), based on a summary of Dr. Lisbeth Godik's *Food Protection Trends* article from 2008.  
**Board Response:** Manuscript of this brochure should be submitted, when completed, for Board review prior to publication.
5. Support further development of the following possible 2010 Program ideas:
  - National Food & Water Safety Regulatory Program Updates.
  - Better Process Cheese Workshop.
  - International, National and Private Food Equipment Standards.
  - FDA Core Dairy Training Workshop (Dairy Plant Inspection, Dairy Farm Inspection, Special Problems, Advanced Training, Pasteurization Controls, etc.) – must be scheduled and coordinate with FDA's State Training Branch and the State of California Department of Agriculture.
  - Technical Requirements for Milk Heating Process – Pasteurization, UHT, ESL, etc.
  - Single Food Agency – Pros & Cons – use speakers from CFIA, EFSA, FDA, USDA, ANZED, etc.
  - Things That Keep Me Up at Night – Preventing Food Safety Nightmares.
  - Keys to Effective Employee Food Safety Training.
  - Chemical Hazards including Melamine – Where Are We Now?
  - Applications of Pathogen Risk Assessment in Low Moisture Dairy Product.
  - Effective Food Product, Ingredient and Packaging Traceability Programs.

- Workshop on Predictive Microbial Modeling for Dry Food Products.
- Insurance and Financial Risk Protection for Food Processing Plants.
- Mechanics and Accreditation of Automated Cleaning Systems.

**Board Response:** Agreed. The Program Committee will review submissions and reply directly to the submitter.

### Food Chemical Hazards and Food Allergy PDG

#### Recommendations to Executive Board:

1. Pamela Wilger suggested this PDG ask the board about what specific financial support would be available for any webinars and recording of webinars and other programs. Also, she was interested in knowing to what extent the board would support the PDG asking industry for financial support of our PDG programs, such as webinars, etc.

**Board Response:** IAFP is able to support webinars, recording of webinars and other programs. Requests, including a proposed budget, should be submitted in advance. Funding from outside of IAFP is also acceptable.

### Food Hygiene and Sanitation PDG

#### Recommendations to Executive Board:

1. The PDG would like to submit Jeff Kornacki as the Vice Chair for the Food Hygiene and Sanitation PDG.

**Board Response:** Agreed.

### Food Law PDG

#### Recommendations to Executive Board: None.

### Food Safety Education PDG

#### Recommendations to Executive Board:

1. We wish for the Board to appoint Ben Chapman as PDG vice chairperson.  
**Board Response:** Agreed.
2. Wikipedia project: We would like to request participation from other PDGs to assist with their content areas. We would like for each committee chair to ask if one or two people from that PDG would be willing to serve as a liaison for the wiki project... really a subcommittee. These individuals will be involved in the conference call that we would set up in a couple of months.

**Board Response:** Agreed. The Board would like an expanded description of this project before organizing additional Members to move forward.

3. We wish to suggest to the Board that whenever a rapid response symposium is developed, the organizers try to incorporate some sort of educational opportunities into the program.

**Board Response:** The Board needs additional clarification on what is requested as each symposium contains educational opportunities for participants.

4. Workshop: We wish the Board's input on our idea to develop the Risk Communication Workshop into a grant proposal for the USDA Workshop/meetings grant program. It would be co-sponsored by IAFP to make it a stronger workshop. IAFP may be subcontracted to handle the organizational portion of the workshop?

**Board Response:** Agreed. The Board is open to this concept and would need to review the proposal prior to a final approval to move forward.

### Fruit and Vegetable Safety and Quality PDG

#### Recommendations to Executive Board:

1. Given these economic times the recommendation was to try to find ways of reducing the cost of attendance to the meeting, since this year was especially difficult to bring students who greatly benefit from this meeting.

**Board Response:** Agreed. The Board, Program Committee and staff are constantly looking to keep costs under control for IAFP's Annual Meetings and other events.

### International Food Protection Issues PDG

#### Recommendations to Executive Board:

1. Leon Gorris was elected Vice Chair.

**Board Response:** Agreed.

2. Support for conference calls, webinars or other forms of communication with global members.

**Board Response:** IAFP is able to support webinars, recording of webinars and other communication efforts. Requests, including a proposed budget, should be submitted in advance of scheduling.

3. Support for a white paper or a framework document on "Components of an Effective Food Safety System" - for *FPT* and other outlets. (There may be different versions for different audiences.)

**Board Response:** Agreed. The Board supports these types of activities by PDGs. If Association resources are anticipated, a proposed budget should be submitted for approval.

### Meat and Poultry Safety and Quality PDG

#### Recommendations to Executive Board:

1. M&P PDG recommends that IAFP provide logistical support for conducting webinars. A participant fee could be charged to recover associated costs. Webex was noted as an efficient webinar provider and should be considered by IAFP especially when international participation and a recording are desired.

**Board Response:** IAFP is able to support webinars, recording of webinars and other communication efforts. Requests, including a proposed budget, should be submitted in advance of scheduling.

2. Election of Craig Henry, GMA, as Vice Chair.

**Board Response:** Agreed.

### Microbial Modelling and Risk Analysis PDG

#### Recommendations to Executive Board:

1. To provide immediate guidance on the process for online submission of symposia and workshops (via bulletin? conference call?) to the IAFP membership (not just PDGs).

**Board Response:** Agreed. When online submission system opens, communication to all Members will be made.

2. To support the PDG staging a webinar (possibly spring 2010). Topics selected to provide awareness of IAFP membership on Predictive Modelling and Microbiological Risk Assessment.

**Board Response:** IAFP is able to support webinars, recording of webinars and other communication efforts. Requests, including a proposed budget, should be submitted in advance of scheduling.

## Retail Food Safety and Quality PDG

### Recommendations to Executive Board:

1. Anne Marie McNamara raised the issue of rotating the PDG meeting times among PDGs from Sunday morning, noon, and afternoon to be equitable to all parties. For example, the retail PDG always has the morning time slot necessitating extra hotel and meal expenses for Saturday travel that other PDGs do not incur if they can fly in Sunday morning. Rotating time slots provides fairness for all.  
**Board Response:** Agreed. A new Committee and PDG meeting schedule will be developed for IAFP 2010.
2. Carl Custer asked that the page charges for *Journal of Food Protection* be dropped to encourage submissions.  
**Board Response:** The JFP Management Committee is looking into options on this issue. A large portion of IAFP's budget comes through page charges and would need to be replaced in some manner.
3. Sharon Wood praised the work of Tamara Ford in assisting with the logistics of the roundtable.  
**Board Response:** Agreed.
4. Sharon Wood was elected Vice-Chair for 2010 and 2011.  
**Board Response:** Agreed. Vice-Chair will assume position at the PDG meeting taking place on Sunday at IAFP 2010.
5. Ann Marie McNamara was introduced as Chair for 2010 and 2011.  
**Board Response:** Agreed. Chair will assume position at the PDG meeting taking place on Sunday at IAFP 2010.

## Seafood Safety and Quality PDG

### Recommendations to Executive Board:

1. Elected as Vice-Chair: Veny Gapud of Popeyes Chicken.  
**Board Response:** Agreed.
2. Better communication with students to attend PDG meetings.  
**Board Response:** Agreed.

## Student PDG

### Recommendations to Executive Board:

1. The executive board was advised to execute an idea as soon as possible because planning a symposium can be tedious.  
**Board Response:** Agreed. The IAFP Board is assuming the reference to the "executive board" is a reference to the leaders of the Student PDG.

## Viral and Parasitic Foodborne Disease PDG

### Recommendations to Executive Board:

1. To elect Marlene Janes as the Vice Chair.  
**Board Response:** Agreed.

## Water Safety and Quality PDG

### Recommendations to Executive Board:

1. Susan McKnight was elected Vice Chair.  
**Board Response:** Agreed.
2. Support for conference calls, webinars or other forms of communication with global members.  
**Board Response:** IAFP is able to support webinars, recording of webinars and other communication efforts. Requests, including a proposed budget, should be submitted in advance of scheduling.

## Affiliate Council

### Recommendations to Executive Board:

1. That the Board support provision of an Affiliate Networking room at future meetings in which Affiliates can meet to discuss and formally present technical information and business management tools to assist with Affiliate development or expansion.  
**Board Response:** Staff will look into logistics and feasibility of providing this room at future Annual Meetings.
2. Establish "FAQ" section on Affiliate Web page of the IAFP Web site.  
**Board Response:** Staff will work to establish a FAQ listing on the Affiliate Web pages. Affiliate Delegates and board members are encouraged to submit questions.
3. Acknowledge the election of David Lloyd Affiliate Delegate from the UKAFP, as in-coming Secretary of the Affiliate Council.  
**Board Response:** Agreed.

# IAFP FOUNDATION SILENT AUCTION RESULTS

OVER \$8,500 RAISED

Donated by	Item	High Bidder
3M	3M Gift Packs 3M Gift Packs 3M Gift Packs	Cindy Anderson Sheila Cook Susan Styles
3M Medical Division	Erasable KED Marker Board	Lynne Rousseau
Gary Acuff	Shiner Commemorator 6 Pack with Book	Kristel Overfelt
American Society for Applied Microbiology	Invisible ABCS Foodborne Microbes	Larry Cohen Gerardo Guzman-Gomez
Anonymous	Flip Video	Yale Lary
Associated Illinois Milk, Food and Environmental Sanitarians	Taste of Chicago Certificate Taste of Chicago Certificate	Peter Slade Peter Slade
Australian Association for Food Protection	Kangaroo Skin in a Carry Bag with Indigenous Australian Design	Dave Larson
Cindy and Dave Blomquist-Creative Confectionaire	Hand Dipped Premium Chocolate Truffles	Henry Atherton
Derrick Blunden	Beer Collection and Bar Mat	Steve Murphy
Borden-Conroe Plant	Borden Glass Milk Bottles, 2 Magnets, Clip and Coaster Borden Glass Milk Bottles, 2 Magnets, Clip and Coaster Borden Glass Milk Bottles, 2 Magnets, Clip and Coaster Borden Ice Chest-2 Hats, 2 T-Shirts Borden Cookie Jar Elsie Cow and Magnet Borden Replica Truck and 4 Coasters Large Golf Borden Umbrella Borden Large Coffee Mug-4 Coasters and a Keychain Borden Ice Chest-2 Hats, 2 Coozies, 4 Coasters, 2 Magnets Gift Bag-Borden-2 Rulers, 2 Pencils, Clip, 4 Coasters, 2 Magnets 2 Borden Caps-4 Coasters Gift Bag-Borden-2 Rulers, 2 Pencils, Clip, 4 Coasters, 2 Magnets Borden Glass Milk Bottles, 2 Magnets, Clip and Coaster Borden Glass Milk Bottles, 2 Magnets, Clip and Coaster Elsie Cow and Magnet Borden Glass Milk Bottles, 2 Magnets, Clip and Coaster Gift Bag-Borden-2 Rulers, 2 Pencils, Clip, 4 Coasters, 2 Magnets Borden Small Flashlight Borden Glass Creamer and 4 Coasters Borden Ice Chest-Shirt-2 Caps, 4 Magnets 2 Borden Caps-4 Coasters Elsie Cow and Magnet	Henry Atherton Henry Atherton Henry Atherton Kristi Barlow Kelly Bunning Denise Eblen Wilbur Feagan Tamara Ford Tamara Ford Beilei Ge Barles Ge Xiuping Jiang Louise Kandakai Sandra Lancaster Linda Leake Lori Ledenbach Susan McKnight Joe Schlessler Philomena Short Arlette Shazer Fred Weber Christina Wilson Jean Wolff
Borden-Dallas Plant	Borden Cookie Jar Borden Cookie Jar Borden Cookie Jar Borden Cookie Jar	Paula Cray Mary Fandrey Kathleen Rajkowski Annie Sofia Torp
Brazil Association for Food Protection	Peace Tree Sculpture Havaianas Flip Flops	Indaue Mello-Hall Indaue Mello-Hall
British Food Journal	Emerald Glass Paper Weight	
Melissa Brumley Schlabs	Rabbit Wine Kit	Gary Acuff
Margaret Burton	Guest Bath Caddy	Chuck Papa
Capital Area Association for Food Protection	Les Hauts French Wine (9 Bottles in the Case)	Fred Weber
Warren Clark	Crystal Frog	Jennifer Lee
Julian Cox	Phillip Hall Print Koala	Bill Cray Cathy Cutter
Creative Confectionaire-Cindy and Dave Blomquist	Hand Dipped Premium Chocolate Truffles	Henry Atherton
Beth Ann Crozier-Dodson	Rosemary's Garden Gift Basket	Carol Deibel
Chuck Czupnyski/Univ. Wisc. Food Research	The Complete History of the Green Bay Packers	Rena Pierami



Donated by	Item	High Bidder
Department of Animal Science-Texas A&M	Christian Becker Chainomatic Analytical Balance	Carol Deibel
DuPont Qualicon	Wind Resistant/Water Resistant Black Jacket	Katherine Robert
Florida Association for Food Protection	Escape to the Beach!	Shawna Veasey
Food Safety Consulting	Cabernet Franc from Niagra on the Lake, Ontario	Peter Hibbard
	Reisling Dry from Niagra on the Lake, Ontario	Fred Weber
Georgia Association for Food Protection	Georgia Gift Basket	Lynne Wright
Catherine Hall	Stone Like Necklace	Bill Cray
	Red, White and Blue Lanyard	Cindy Jiang
	Metal Asian Necklace	Kristina Barlow
	Asian Necklace and Bracelet	Janet Buffer
	Brown and Black Necklace	Larry Cohen
	Black Necklace	Induae Mello-Hall
	Jade Necklace	Karl Olson
	Jade Necklace	Karl Olson
	Eye Glass Holder	Don Ritch
	Turquoise Lanyard	Jenny Scott
	Blue Lanyard	Jenny Scott
	Brown Lanyard	Kathy Tucker
	Gold and Teal Necklace	Rebecca Vigue
Paul Hall	Paulnac Hat	Ynes Ortega
Joe Heidenrich & Anne Sofie Torp	Selection of Aquavint	Karl Olson
	Norway Book and Polar Bear	Bill Schwartz
Highfield Co.UK LTD.	"A Case of Ignorance" Training DVD	Bennett Armstrong
	"Hygiene for Management	Induae Mello-Hall
Hilmar Cheese Company	Spring Jacket	Albert Espinoza
	Spring Jacket	Willis Fedio
Messina Hof	Cabernet Sauvignon	Melissa Hughes
	Papa Paulo Port	Allen Saylor
Indiana Environmental Health Association	Brown County, Indiana Framed Photo	Mag Binkley
International Association for Food Protection	Food Safety Icon CDs	Cindy Anderson
	2010 Annual Meeting Registration	Lynne Madison
	Foodborne/Waterborne Booklets	Gale Prince
Kansas Environmental Health Association	Made In Kansas Items	Fred Reimers
Kimbrell & Associates	Clean It or Recall It	Induae Mello-Hall
Bobby Krishna	World's First and Finest Carmel Milk Chocolate	Bill Cray
	World's Most Luxurious Hotel-Dubai	Praveena Sunkara
	World's First and Finest Carmel Milk Chocolate	Kyle Sasahara
	World's First and Finest Carmel Milk Chocolate	David Tharp
Kroger and Texas Association for Food Protection	Kroger \$10 Gift Card	Gale Prince
	Kroger \$10 Gift Card	Gale Prince
	Kroger \$20 Gift Card	Gale Prince
	Kroger \$20 Gift Card	Gale Prince
	Kroger \$10 Gift Card	Kathy Robert
	Kroger \$10 Gift Card	Kathy Robert
Linda Leake	The Texas Cowboy Kitchen	Maria Teresa Destro
Vickie Lewandowski	Hand Painted Armadillo	Ynes Ortega
Didi Loynachan	Gaylord Resort Cap	Henry Atherton
Margaritaville Enterprises, LLC	Margaritaville Frozen Concoction Maker	Peter Hibbard
Matrix MicroScience	Pacheco Ranch 2003 Cabernet Sauvignon	Steve Murphy
	Givich Vineyards 2005 Chardonnay	Philip Wolff
Metropolitan Association for Food Protection	New Jersey Ice Wine	Christine Bruhn
	New Jersey Cabernet	Joyce Cingel
	New Jersey Cranberry Wine	Albert Espinoza
	New Jersey Blue Berry Wine	Thomas Graham
	New Jersey Blue Berry Wine	Gale Prince
Microbiology International	T-Shirt	Melissa Davidson
	T-Shirt	Guimel Kappell
	T-Shirt	Jackie Miles
	I Pod	Jennifer Quinlan
	Framed Picture	Frank Yiannas
Milk Mart/Ann Bauer	Texas Picnic Set	Trish Wester

Donated by	Item	High Bidder
Missouri Milk, Food & Environmental Health Association	Food Gift Basket	Wilbur Feagan
National Food Laboratory	Handmade Purse or Totebag for Personal or Business Use	Lori Ledenbach
New York Association for Food Protection	Chatueau Lafayette–New York State Wine Wiemers Riesling–New York State Wine New York State Maple Syrup–Delivered New York State Cheese	Albert Espinoza Bill Northeimer Kathleen Rajkowski Kathleen Rajkowski
Ohio Association for Food Protection	“New Era” CD by the OSU Marching Band 2009 IAFP T-Shirt – Ohio	David Calvin Pat Prince
Ontario Food Protection Association	Ontario Ice Wine Ontario Ice Wine	John Bruhn Steve Murphy
Orkin	MP3 Player	Joanne Ruebl
Publix Super Markets Inc.	Gift Basket	Ray Kimbrell
Sara Lee Foods	Coffee Maker Picnic Pack Brief Case Picnic Pack	Gary Acuff Terry Graton Marilyn Lee Dawn Terrell
Springer	Effective Risk Communication Food Safety Culture	Richelle Beverly Allen Saylor
Tetley Group	Tetley Tea Gift Bag	Lisa Hovey
Texas A & M University	Dublin Dr. Pepper Gift Basket	Lyn Herring
Texas A&M University–Center of Food Safety	Dublin Dr. Pepper Gift Basket	Lyn Herring
Texas Association for Food Protection	Sunkist Cooler Texas Affiliate Meeting Hat and T-Shirt	Louise Kandanki Stefano Colombo
Connie and David Tharp	Cultured Pearl and Lemon Quartz Necklace	Paul Hall
Washington Association for Food Protection & Beechers Cheese	Beechers Cheese Cookbook 3 Month Cougar Cheese of the Month	Ken Janes Steve Murphy
Weber Scientific	Raw Ingredient Quality in Processed Foods Siegfried Cow Parade Holstein Lab Coat Holstein Leather Jacket <i>Staphylococcus</i> Silk Scarf (Maize/Gray) <i>Giardia</i> Silk Neck Tie (Gray/Purple) <i>Giardia</i> Silk Neck Tie (Brown/Red) Liberty Cow Parade <i>Staphylococcus</i> Silk Neck Tie (Taupe/Gold) HACCP, A Practical Approach Mad Cow Silk Neck Tie (Burnt Orange) <i>Staphylococcus</i> Silk Neck Tie (Burgundy/Gold) Crystallization in Foods Holstein Lab Coat Roy Cow Parade Mad Cow Silk Neck Tie (Yellow/Red)	Eileen Chase Cathy Cutter Melissa Davidson Thomas Graham Linda Harris Joe Heidenreich Pat Johnson Jennifer Lee Indaue Mello-Hall Claudio Narvaez Maria Nazarowic-White Jenny Scott Allen Saylor Guy Skinner Dan Sowards
Wegmans Food Markets, Inc.	Down Home with the Neelys Bob Green the Best Life Diet	Tamara Ford Rena Pierami
Wyoming Environmental Health Association	You Know You're a Health Inspector When...T-shirt	Kristel Overfelt

# IAFP 2009 EXHIBITORS

Indicates IAFP Sustaining Member

## 1 Priority Biocidal, LLC

2651 Gravel Drive  
Fort Worth, TX 76118, USA  
Phone: 817.590.8100  
<http://www.go1bio.com>

Fax: 817.288.0686

## 3-A Sanitary Standards, Inc.

6888 Elm St., Suite 2D  
McLean, VA 22101-3829, USA  
Phone: 703.790.0295  
<http://www.3-a.org>

Fax: 703.761.6284

## 3M Microbiology

3M Center, Bldg. 275-5W-05  
St. Paul, MN 55144-1000, USA  
Phone: 651.733.1213  
<http://www.3m.com/microbiology>

Fax: 651.737.1994

## ABC Research Corporation

3437 SW 24th Ave.  
Gainesville, FL 32607, USA  
Phone: 352.372.0436  
<http://www.abcr.com>

Fax: 352.378.6483

## Advanced Instruments, Inc.

2 Technology Way  
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# 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. Nomination criteria is available at:

[www.foodprotection.org](http://www.foodprotection.org)

## Nominations deadline is February 16, 2010

You may make multiple nominations. All nominations must be received at the IAFP office by February 16, 2010.

- ◆ Persons nominated for individual awards must be current IAFP Members. Black Pearl Award nominees must be companies employing current IAFP Members. GMA Food Safety Award and Frozen Food Foundation Research nominees do not have to be IAFP Members.
- ◆ Previous award winners are not eligible for the same award.
- ◆ Executive Board Members and Awards Selection Committee Members are not eligible for nomination.
- ◆ Presentation of awards will be during the Awards Banquet on August 4, at IAFP 2010 in Anaheim, California.

Contact IAFP for questions regarding nominations.



International Association for  
**Food Protection**®

6200 Aurora Ave., Suite 200W  
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## Nominations will be accepted for the following Awards:

### Black Pearl Award

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

### Fellow Award

Distinguished Plaque

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

### Honorary Life Membership Award

Plaque and Lifetime Membership in IAFP

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

### Harry Haverland Citation Award

Plaque and \$1,500 Honorarium  
Sponsored by ConAgra Foods, Inc.

Presented to an individual for many years of dedication and devotion to the Association ideals and its objectives.

### Food Safety Innovation Award

Plaque and \$2,500 Honorarium  
Sponsored by Walmart

Presented to a Member or organization for creating a new idea, practice or product that has had a positive impact on food safety, thus, improving public health and the quality of life.

### International Leadership Award

Plaque, \$1,500 Honorarium  
and Reimbursement to attend IAFP 2009  
Sponsored by Cargill, Inc.

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.

### GMA Food Safety Award

Plaque and \$3,000 Honorarium  
Sponsored by Grocery Manufacturers Association

This Award alternates between individuals and groups or organizations. In 2010, the award will be presented to a group or organization in recognition of a long history of outstanding contributions to food safety research and education.

### Frozen Food Foundation Research Award

Plaque and \$2,000 Honorarium  
Sponsored by the Frozen Food Foundation

Presented to an individual, group or organization for preeminence and outstanding contributions in research that impacts food-safety attributes of freezing.

### Maurice Weber Laboratorian Award

Plaque and \$1,500 Honorarium  
Sponsored by Weber Scientific

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

### Larry Beuchat Young Researcher Award

Plaque and \$2,000 Honorarium  
Sponsored by bioMérieux, Inc.

Presented to a young researcher who has shown outstanding ability and professional promise in the early years of their career.

### Sanitarian Award

Plaque and \$1,500 Honorarium  
Sponsored by Ecolab Inc.

Presented to an individual for dedicated and exceptional service to the profession of Sanitarian, serving the public and the food industry.

### Elmer Marth Educator Award

Plaque and \$1,500 Honorarium  
Sponsored by Nelson-Jameson, Inc.

Presented to an individual for dedicated and exceptional contributions to the profession of the Educator.

### Harold Barnum Industry Award

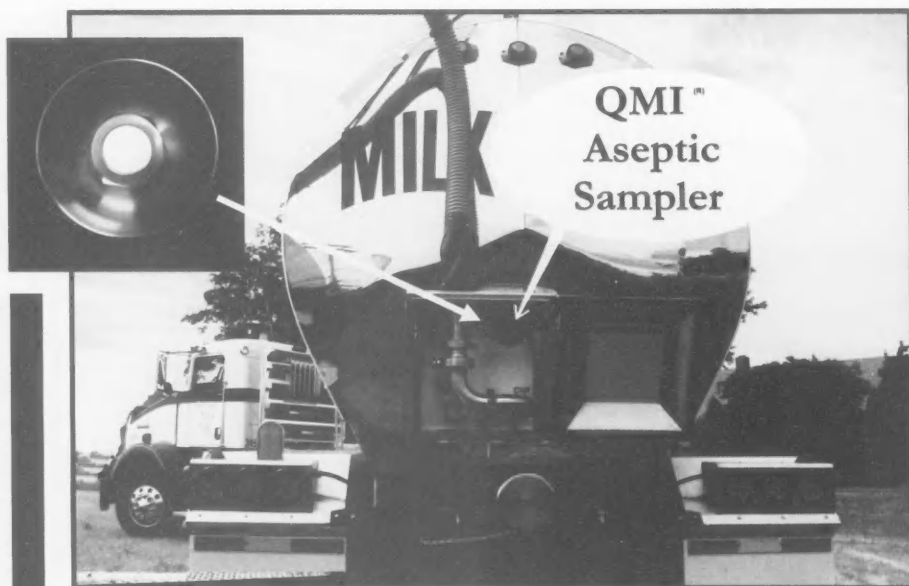
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International Association for  
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# *Call for Nominations 2010 Secretary*

---

A representative from the education sector will be elected in March of 2010 to serve as IAFP Secretary for the year 2010–2011.

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

David A. Golden, Ph.D.  
University of Tennessee  
Dept. of Food Science and Technology  
2605 River Dr.  
Knoxville, Tennessee 37996-4591  
Phone: 865.974.7247  
E-mail: david.golden@tennessee.edu

The Secretary-Elect is determined by a majority of votes cast through a vote taken in March of 2010. Official Secretary duties begin at the conclusion of IAFP 2010. 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 October 30, 2009*



# NEW MEMBERS

## AUSTRALIA

**Mark Turner**  
University of Queensland  
Brisbane

## BRAZIL

**Fernanda Castro**  
iTAL  
Campinas, São Paulo

**Priscilla Henn**  
Perdigao Agroindustrial S/A  
Santa Catalina

**Ana L. Penteado**  
UNICAMP (University of Campinas)  
Guaratiba, Rio de Janeiro

**Ernani Porto**  
ESALQ – Universidade de São Paulo  
Piracicaba, São Paulo

## CANADA

**Melanie Gignac**  
Quebec Ministry of Agriculture  
Quebec

**Emma Hartnett**  
Ottawa, Ontario

**Jessica Morris**  
City of Hamilton, Health Protection  
Division  
Hamilton, Ontario

**Jacqueline P. Upham**  
Canadian Food Inspection Agency  
Dartmouth, Nova Scotia

## IRELAND

**Richard Fernandes**  
Luxcel Biosciences Ltd.  
Cork

## JAPAN

**Junji Arita**  
Tokyo

**Hideaki Matsuoka**  
Tokyo University of Agriculture  
and Technology  
Tokyo

**Akira Oshima**  
Tokyo

## MEXICO

**Jorge Castrillon**  
Griffith Laboratories  
Estado de Mexico, CP

**Guadalupe Mondragon**  
3M  
Distrito Federal

**Maria Dolores Ramirea**  
Laboratorio Estalal  
Toluca

**Fernando Tuz-Dzib**  
INCMNSZ  
Mexico City

## NETHERLANDS

**Joost Thijssen**  
Wageningen

## NORWAY

**Dagbjørn Skipnes**  
Nofima Norconserv AS  
Stavanger

## PANAMA

**Denisse M. Broce**  
3M Panama  
Panama

## THAILAND

**Jirarat Tattiyakul**  
Chulalongkorn University  
Bangkok

## UNITED KINGDOM

**Doris Engesser-Sudlow**  
DuPont Qualicon  
Uxbridge, Middlesex

**Olga Gandelman**  
Lumora Ltd.  
Ely, Cambridgeshire

## UNITED STATES

### ARIZONA

**Peter C. Brine**  
St. Josephs Hospital – Food  
and Nutrition Services  
Phoenix

### ARKANSAS

**Usman Adamu**  
University of Arkansas at Pine Bluff  
Pine Bluff

**Rong Y. Murphy**  
FPTI, LLC  
Fayetteville

**Lynette L. Ryan**  
Tyson Foods Inc.  
Springdale

**Lynne Rousseau**  
3M  
Springdale

### CALIFORNIA

**Scott Barrington**  
Waypharm USA  
Laguna Beach

**Turonda R. Crumpler**  
BP West Coast Product LLC  
La Palma

**Gavin Fischer**  
Agilent Technologies  
La Jolla

**Bill King**  
DSM  
Walnut Creek

**Thilde Peterson**  
Waypharm USA  
Laguna Beach

### COLORADO

**Juan C. Leon**  
US Air Force  
Fort Collins

**Octavio Lopez**  
Arthur Schuman Inc.  
Elizabeth



# NEW MEMBERS

## CONNECTICUT

**Vanessa E. Teter**  
Watson, Inc.  
West Haven

## DELAWARE

**Jigisha Rathod**  
DuPont Qualicon  
Wilmington

## FLORIDA

**Brian J. Farina**  
Deibel Laboratories, Inc.  
Gainesville

## GEORGIA

**Andres Arteaga**  
Chemstar Corporation  
Lithia Springs

**Allison Keeble**  
Food Lion LLC  
Ringgold

**Henry Nahmad**  
Chemstar Corporation  
Lithia Springs

**Karen Parucki**  
CSM BSNA  
Tucker

## ILLINOIS

**Johannes Burlin**  
Silliker, Inc.  
Homewood

**Jim B. LaRocco**  
Great Kitchens Inc.  
Romeoville

**Robert Newton**  
Abbott Molecular  
Des Plaines

**Merritt C. Walker, IV**  
BioControl Systems  
Geneva

## INDIANA

**John L. McKillip**  
Ball State University  
Muncie

**Michael R. Swanson**  
Maplehurst Bakeries  
Carmel

## KANSAS

**Kathrine Robnett**  
Kansas Dept. of Agriculture  
Lawrence

**Steve Romero**  
Industrial Fumigant Company  
Olathe

## MARYLAND

**Rowena Roberts**  
BioTraction Associates  
Rockville

**Emily Seay**  
JHU/Applied Physics Laboratory  
Laurel

**Elizabeth N. Williams**  
University of Maryland  
College Park

**John Woloszyn**  
Intralytix, Inc.  
Baltimore

**Charles Young**  
Johns Hopkins University  
Laurel

## MINNESOTA

**Robert Demorest**  
MOCON, Inc.  
Minneapolis

**Francine Savage**  
3M Company  
St. Paul

## MISSOURI

**Mary E. Fandrey**  
Missouri Dept. of Health and Senior  
Services  
Jefferson City

**Russell Lilly**  
Missouri Dept. of Health and Senior  
Services  
Springfield

## NEBRASKA

**Jairus R. David**  
ConAgra Foods  
Omaha

## NORTH CAROLINA

**Paul L. Knechtges**  
East Carolina University  
Harrellsville

## OHIO

**Daren Brown**  
Kroger  
Cincinnati

**Beverly Rhoads**  
Eastern Laboratory Services  
Medina

## PENNSYLVANIA

**Andrea Johnson**  
FMC  
Philadelphia

**Michelle Lovett**  
Eurofins Food Safety Systems  
Emmaus

**Samuel A. Maclay**  
Land O'Lakes, Inc.  
Mechanicsburg

**Susan Ranck**  
Kellogg Morning Foods  
Lancaster

## TEXAS

**Helen M. Barela**  
Texas Tech University  
Lubbock

**Jill Gallegos**  
Frito-Lay  
Plano

**Sun Lee**  
Frito-Lay, Inc.  
Plano

**Joel Ortiz**  
Whole Foods Market  
Austin



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# NEW MEMBERS

**Sunita Patel**

Frito-Lay, Inc.  
Plano

**Amy Reagan**

Thermo Fisher Scientific  
Coppell

**Sherry Rhoads**

ConAgra Foods  
Saginaw

**Larry Schaumburger**

Frito Lay  
Plano

**Juan Torres**

Camelot Desserts  
Sugar Land

**Steve Young**

Tyson Foods  
North Richland Hills

**VIRGINIA****Monica B. Elliott**

Farm Fresh Supermarkets  
Virginia Beach

**Ken Hearst**

Staunton-Augusta Health Dept.  
Staunton

**Jennifer Quinn**

Interscience  
Rockland

**WASHINGTON****Ozgur Koc**

Crunch Pak  
Cashmere

**Kent Oostra**

Exact Scientific Services  
Bellingham

**WISCONSIN****Jay L. E. Ellingson**

Kwik Trip Inc.  
LaCrosse

**Brian Gardner**

ACH Food Companies, Inc.  
Waunakee

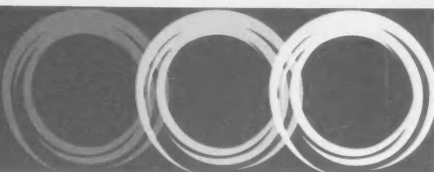
**Gloria Durst Joseph**

CROPP/Organic Valley  
La Farge

**Dale Osuldsen**

WDATCP  
Marshfield

# WHAT'S HAPPENING IN FOOD SAFETY



## **NMC Update: To Pasteurize or Not to Pasteurize?**

**F**ew food safety issues have had such a long history and intensity as the debate over the question: "Milk, to pasteurize or not to pasteurize?"

The pros and cons of pasteurization have been debated since 1908 when Chicago required the pasteurization of all milk unless it came from tuberculin-tested cows. Recently, the debate has resurfaced, with several states examining their requirements related to the direct sale of raw milk to consumers.

Earlier this year, the International Association for Food Protection (IAFP), in collaboration with the Raw Milk Subcommittee of the Dairy Quality and Safety PDG, organized a session devoted to "Raw Milk Consumption: An Emerging Public Health Threat?" which was held in Arlington, Virginia. An excellent summary of the session can be found here <<http://nmconline.org/news/rawmilkssess.pdf>>.

The NMC Research Committee, at the request of the NMC Board of Directors, is currently developing a proposed position statement on the consumption of raw milk. The document will go back to the Board for further review.

## **CDC Official Recommends Hand Sanitizers to Avoid Flu**

**I**f you want to combat both varieties of flu this season, keep the hand sanitizer ready and your work spaces clean, officials with the Centers for Disease Control said.

Lisa Koonin of the CDC told a Newnan audience that alcohol-based hand gels work well – in fact, the CDC keeps it handy around its Atlanta offices.

The plan is to use the current health care provider network – enrolling private providers to give the vaccine. The state currently has requests for the vaccine that total 65,000 doses.

The CDC's main message has been for everyone experiencing flu-like symptoms this fall to stay home, and for school systems and employers to allow that to happen without negative consequences.

## **Melon Acres Announced the Recall of Cantaloupes Distributed through Farm-Wey Produce of Lakeland FL, Due to Potential Health Concerns**

**T**he cantaloupes were shipped August 13th and 14th and were identified as 41 MG 10, Bin Numbers 4753-4980. These bins were distributed to Aldi's in Greenwood, Indiana and Meijer in Lansing, Michigan, Newport, Michigan, and Tipp City, Ohio. The recall was issued following a testing on August 11, 2009 by the United States Food and Drug Administration (FDA) that revealed one of a sample of twenty cantaloupes taken by that Agency tested positive for *Salmonella*. The FDA reported the positive test to Melon Acres on August 21, 2009.

*Salmonella* is an organism which can cause serious and sometimes fatal infections in young children, frail or elderly people, and others with weakened immune systems. Healthy persons infected with *Salmonella* often experience fever, diarrhea (which may be bloody), nausea, vomiting and abdominal pain. In rare circumstances, infection with *Salmonella* can result in the organism getting into the bloodstream

and producing more severe illnesses such as arterial infections (i.e., infected aneurysms), endocarditis and arthritis.

As of this date, there have been no reports of illness. Further, the FDA and Melon Acres identified the field in which the contaminated sample was grown. No further shipments will be made from the source field. Melon Acres is currently working with the FDA to identify the source of contamination.

Melon Acres sincerely regrets this situation and wishes to assure the public that stringent food safety programs are in place at its shipping locations and fields. On August 7th, Primus Labs, a third party food safety auditing firm specializing in produce, inspected Melon Acres' fields and facilities regarding its food safety practices. Melon Acres received grades of excellent/good, respectively, in this audit.

## **FDA Issues Draft Guidances for Tomatoes, Leafy Greens and Melons**

**T**he US Food and Drug Administration has published three draft guidances designed to help growers and others across the entire supply chain minimize or eliminate microbial contamination in tomatoes, leafy greens, and melons.

The guidances are, in part, based on those originally developed by the produce industry with assistance from FDA. They represent the first step in a fundamental shift in strategy for the agency in the prevention of foodborne hazards associated with fresh fruits and vegetables.

"These guidances embody the Obama Administration's and



FDA's prevention-oriented food safety strategy," said FDA Commissioner Margaret A. Hamburg, M.D. "They will be made final as soon as possible after public comment, and will be followed within two years by enforceable standards for fresh produce."

These commodity-specific guidances were called for by the President's Food Safety Working Group, which recommends a new, public-health focused approach to food safety. In a report issued earlier this month, the working group made recommendations aimed at creating a stronger food-safety system. The recommendations stem from three core food safety principles:

- Prevent harm to consumers
- Use good data and analysis to ensure effective food-safety inspections and enforcement of the law
- Identify outbreaks of food-borne illness quickly and stop them

Key elements of the draft guidances related to the working group's strategies include:

- An acceptable baseline standard of industry practices that help both domestic and foreign firms minimize the risk for microbial contamination of their products throughout the entire supply chain
- Recommendations regarding growing, harvesting, packing, processing, transportation, and distribution of the product
- Recommendations for recordkeeping, including some that will help the FDA determine more quickly the source of outbreaks that do occur.

Comments on FDA's guidance documents may be submitted at any time. However, to ensure that comments are received in time for consideration in drafting final versions of these guidance documents, written or electronic comments should be submitted within 90 days of publication in the Federal Register. See <http://www.regulations.gov> for information.

### Mapping and Modeling Eastern United States Food Production

**A**gricultural Research Service (ARS) scientists are mapping an array of county-level data from Maine to Virginia on weather, soil, land use, water availability and other elements. Then they'll use their map to model potential crop production and find out where local food production could meet current and projected demand—and where it won't.

Until recently, low fuel prices have contributed to the globalization of the US food system. Food crops that are grown and processed in one region are often transported over long distances to a range of different markets. As a result, many of the fruits and vegetables consumed in the US Eastern Seaboard Region have been produced and brought in from other parts of the country or other parts of the world.

Research leader Wayne Honeycutt and agricultural engineer David Fleisher believe that relying more on the strategic production of locally grown food can counter the challenges of rising transport costs, growing population demands and vanishing farmlands. Honeycutt works at the ARS New England Plant, Soil and Water Research Laboratory in Orono, Maine, and Fleisher works at the ARS Crop Systems and Global Change Laboratory in Beltsville, MD.

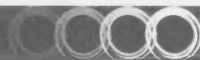
Expanding the opportunities for local food production could stimulate rural development and offset the risk of food shortages in one area by increasing and diversifying local production in other areas. So the scientists are collaborating with a range of partners to model actual crop production practices and the flow of agricultural products into supply chains, including all the associated handling and transportation costs, from farm field to market. This will help identify how the costs and benefits of locally grown produce compare with produce that is transported over long distances to the Eastern Seaboard market.

### International Consultant to be Conferred Membership to Country's Top Scientific Body

**T**he GCH Center is proud to announce that Dr. Manuel M. Garcia, international consultant and technical director, was conferred to the title of corresponding member of the national academy of science and technology on July 9 at the conclusion of NAST's 31st Annual Meeting in Manila. NAST is the highest scientific council composed of the country's top scientists and aims to recognize excellence in science and technology and to promote a strong reservoir of competent manpower in these fields. The Academy serves as the advisory body to the President of the Philippines. Corresponding members are foreign-based scientists with Filipino heritage who are elected based on their scientific achievements and their contributions to science and technology in the Philippines. Dr. Garcia is only the sixth corresponding member since NAST's establishment in 1976.

Dr. Garcia completed his BSA (Honors Curriculum) and MS in UPLB and is the first to receive the





Ph.D. from the University of Guelph, Ontario, Canada. He is a former research scientist of the Animal Diseases Research Institute of Agriculture and Agri-Food Canada and is internationally recognized for his highly productive research work on anaerobic microbiology and zoonotic infections. He has been active in international development and his leadership in promoting and training scientists and technologists on food safety, HACCP, laboratory QA and Rapid Tests in China, Latin America, Australia, the Caribbean, the ASEAN as well as in North America. Since 1994, He has been coming yearly to the Philippines to implement training programs on food safety and microbiology and served as consultant to several government agencies, the academe (as adjunct professor) and the food industry. He has assisted many SMEs in the food industry as a Canadian Executive Service Organization volunteer consultant. He is a recipient of several awards notably, the Presidential Award for Outstanding Filipino Overseas (Agriculture in 1977 and Microbiology and Food Safety in 1998), Distinguished UPCA Alumni Award (1999), twice a DOST Balik Scientist and the Outstanding Awardee (Negrense) in S&T in his home province of Negros Oriental (2008). He was among those featured in Isabelo Crisostomo's book on "Profiles in Excellence: Filipino Achievers in the USA and Canada."

Dr. Garcia gave a presentation at the 29th Annual Meeting of the Philippine-American Science and Engineering Association July 13-15. He also conducted a 3-day HACCP

course for the food industry at the Food Development Center. In July, he hosted by the GCH Center in Maboloc, Cebu.

### **Microbia Names John McCarthy to Senior Management Team**

**M**icrobia, Inc., has appointed John A. McCarthy Jr. as senior vice president corporate strategy and chief financial officer. Mr. McCarthy will have broad responsibility for corporate strategic planning, finance, human resources, corporate communications and information technology as the company prepares to introduce its line of natural carotenoid products for the human and animal food ingredient and nutritional supplement markets early next year.

"John's extraordinary track record of success in the transformation and growth of science-based companies from research and development-focused organizations to broad commercial entities will be vital as we accelerate our plans to take advantage of the large-scale market opportunities afforded by our technologies," stated Richard Bailey, Ph.D., Microbia's president and chief executive officer.

John McCarthy brings 17 years of executive management experience to Microbia from the broad healthcare and alternative energy industries. Most recently, he served as executive vice president and chief financial officer of Verenum Corporation, a publicly traded leader in the biofuels industry.

Prior to Verenum, he served as senior vice president and chief

financial officer for Xanthus Pharmaceuticals, senior vice president corporate development and chief financial officer for Synta Pharmaceuticals, executive vice president, chief operating officer and chief financial officer for Exact Sciences, and president of the Managed Care Division for Concentra Managed Care.

Mr. McCarthy also worked in the investment banking division of Morgan Stanley and graduated with a Bachelor of Science degree from Lehigh University and an MBA from Harvard Business School.

### **FDA Appoints Michael Taylor as Senior Advisor**

**M**ichael Taylor is a nationally recognized food-safety expert whose appointment as senior advisor to the commissioner at the Food and Drug Administration (FDA) is applauded by the National Fisheries Institute (NFI).

In his earlier tenure at the FDA, Mr. Taylor led the development of the existing Seafood Hazard Analysis Critical Control Point regulations that have been so successful in highlighting the effectiveness of a risk-based approach to food safety.

We are pleased that among his initial responsibilities will be allocating fiscal year 2010 resources and planning for the implementation of new food-safety legislation. NFI has advocated for increased funding for FDA, particularly in the area of food safety.

We welcome the opportunity to once again work with Mr. Taylor as he continues to build on the FDA's legacy of ensuring that safe and healthy seafood is available to Americans.

# INDUSTRY PRODUCTS



Hoefler, Inc.

## New Life Science Spectrophotometers from Hoefler, Inc.

Hoefler, Inc. has announced the introduction of the New Vision Life Science Spectrophotometers.

The Vision Spectrophotometers include 16 predefined methodologies for nucleic acid quantification (DNA, RNA and oligonucleotides), protein assays (BCA, Lowry, biuret) kinetics, standard curve, cell density measurements and CY DYE for labeling of PCR Probes. Additionally, the Vision can accommodate up to 90 custom protocols.

The combination of the life science methods with rapid scanning, kinetics and concentration capabilities of the Vision Spectrophotometer make it a great addition to any molecular biology or biochemistry laboratory.

The visualization of the nucleic acid scan with the full graphic display is particularly useful, especially for RNA samples where impurities might be present in the 230 nm

region, but not have an adverse effect on the Absorbance of 260/280 ratio.

In kinetics mode, the basic plot of absorbance against time may be supplemented with the result for  $\delta A/\text{min}$  plus the correlation coefficient is also calculated for the duration of the assay. This slope may be multiplied automatically by a factor to convert it directly to rate of reaction.

The Vision Life Science Spectrophotometer has novel Gifford optics for high energy combined with a Xenon source for long life. It includes a unique, integral cuvette tray for storage of expensive cells and sample support. Additionally, an optional integrated printer or wireless Bluetooth connectivity are available.

**Hoefler, Inc.**  
800.227.4750  
Holliston, MA  
[www.hoeflerinc.com](http://www.hoeflerinc.com)

## DuPont Qualicon BAX® System 24E Assays for Listeria Certified by AOAC

Two BAX® System assays from DuPont Qualicon have received certification from the AOAC Research Institute as next-day methods for detecting *Listeria* in food and environmental samples.

The BAX® System 24E Assays for detecting *Listeria* species, an indicator organism, and *Listeria monocytogenes*, a pathogen, were developed in collaboration with Oxoid, Ltd. Validation studies on hot dogs, spinach, cooked shrimp, queso fresco cheese and stainless steel showed that the BAX® System

performed as well or better than traditional culture methods and with much quicker time to result.

"Coupled with the certification, these assays have already received from AFNOR in Europe, this AOAC-RI validation provides customers with additional assurances of accuracy and reliability," said Morgan Wallace, senior research microbiologist, DuPont Qualicon.

Food processing companies around the world rely on the BAX® System to detect pathogens or other organisms in raw ingredients, finished products and environmental samples. The automated system uses leading-edge technology, including polymerase chain reaction (PCR) assays, tableted reagents and optimized media to detect *Salmonella*, *Listeria* species, *Listeria monocytogenes*, *E. coli* O157:H7, *Enterobacter sakazakii*, *Campylobacter*, *Staphylococcus aureus*, *Vibrio*, yeast and mold. With certifications and regulatory approvals in the Americas, Asia and Europe, the BAX® System is recognized globally as one of the most advanced pathogen testing systems available to food companies.

**DuPont Qualicon**  
800.863.6842  
Wilmington, DE  
[www.qualicon.com](http://www.qualicon.com)

## Dickson Chart Recorders

For on-the-spot written documentation of environmental conditions—temperature, humidity, pressure, or other electronic signal—Dickson chart recorders are your instrument of choice. The larger the chart on the model you select, the easier it is to see data details.

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

The publishers do not warrant, either expressly or by implication, the factual accuracy of the products or descriptions herein, nor do they so warrant any views or opinions offered by the manufacturer of said articles and products.

# INDUSTRY PRODUCTS

- Dickson Chart Recorders—circular or strip—give you an easy-to-read graph of data vs. time
- Data is immediately available at a glance
- No computers or data downloading is required
- Minimal set-up time
- Easy-to-use, even for those with no technical training
- and Paper records can be photocopied and filed

**Dickson**  
800.323.2448  
Addison, IL  
www.DicksonData.com

## US EPA Registers PURE Bioscience's SDC-based Food Contact Surface Sanitizer

**P**URE Bioscience, creator of the patented silver dihydrogen citrate (SDC) antimicrobial, has announced that it has obtained US Environmental Protection Agency (EPA) registration for its SDC-based sanitizer for food contact surfaces. The new sanitizer was registered by PURE's wholly owned subsidiary, ETI-H2O, under the trade name Axen<sup>®</sup>50 for sanitization of food contact surfaces and equipment in dozens of environments, including farms, food processing plants, schools, hospitals and other institutions, restaurants and homes.

Michael L. Krall, president and CEO of PURE Bioscience commented, "This long-awaited registration opens new, major markets for PURE Bioscience. Foodborne illnesses create significant health and economic problems in the US and internationally, and PURE welcomes the opportunity to offer a technology to help stem the spread of these dangerous

pathogens that cause millions of illnesses."

Mr. Krall continued, "The EPA's registration of Axen50 as a food contact sanitizer cleared a big hurdle for PURE. Now that we've established a food contact tolerance of 50 parts per million of silver, this registration provides two roads to market for SDC-based food contact surface sanitizers via the EPA. We plan to add the extensive broad-spectrum antimicrobial claims from our existing disinfectant registration to the registration of the new food contact sanitizer, and, also through the EPA, we expect to amend our disinfectant product registration claims to add the new food contact sanitization claims. The EPA regulatory work will include state registrations by distributors and is expected to take at least six months.

"In addition, this registration accelerates our ongoing pursuit, through USDA, of additional direct food contact applications of SDC-based formulations as antimicrobial processing aids."

The CDC estimates that foodborne pathogens cause 76 million illnesses per year in the US resulting in 325,000 hospitalizations and 5,200 deaths. And although Americans have come to expect such risks associated with meat products like raw hamburger, the proportion of outbreaks caused by seemingly innocuous fruits and vegetables is increasing. *E. coli* alone causes approximately 70,000 infections each year, and 5–10% of those infected develop a potentially fatal kidney complication called hemolytic uremic syndrome.

Foodborne illness creates not only health but also confidence issues for consumers. Food recalls can cause a significantly negative

economic impact on businesses. For example, salmonellosis is estimated by the CDC to cost more than \$1 billion in medical costs and lost wages annually.

Mr. Krall concluded, "This summer's recall of more than 5 million pounds of beef because of suspected *E. coli* contamination is just one example of a string of recalls in the US this year, including the well-publicized cookie dough recall and the wide-reaching recalls of peanut and dried milk products. SDC-based food contact surface sanitizers will offer the same benefits of efficacy as our disinfectants along with the same remarkable Category IV toxicity for which no warning statements are required. In addition, SDC-based food contact sanitizers are odorless, colorless, non-corrosive, do not require hazardous materials procedures or gear and do not require rinsing after use. We believe that this combination of unique benefits creates a competitive edge for SDC-based food contact sanitizers."

Food contact surface antimicrobials are processed as "sanitizers" by the EPA and, if registered, can only carry a 60-second sanitization claim, even if laboratory testing demonstrates faster kill times.

SDC is an electrolytically generated source of stabilized ionic silver. As a platform technology, SDC is distinguished from competitors in the marketplace because of its superior efficacy, low toxicity and the inability of bacteria to form a resistance to it. The first new disinfectant active to be registered by the EPA in more than 30 years, SDC-based disinfectants are antiviral, antifungal and antibacterial, including a 30-second kill and 24-hour residual protection against standard indica-

To learn more, visit [www.purebioscience.com](http://www.purebioscience.com) or call 800.323.2448.

# INDUSTRY PRODUCTS

tor bacteria and a two-minute kill claim on MRSA (Methicillin-resistant *Staphylococcus aureus*), CA-MRSA, PVL-MRSA and VRE (Vancomycin-resistant *Enterococcus faecium*). Moreover, SDC-based disinfectants are odorless, colorless, non-corrosive, non-flammable and are compatible with other disinfecting and cleaning chemicals.

**PURE Bioscience**  
619.596.8600  
San Diego, CA  
www.purebio.com

## Hardy Diagnostics Releases HUGO v.7

**H**ardy Diagnostics offers HUGO™ v.7 (Hardy User Group Observer), a software program that serves as a technical reference manual and encyclopedia for microbiologists. HUGO™ v.7 contains over 4,500 pages of reference material and procedures related to culture media including quality control, safety, antimicrobials, agency regulation, rapid test methods and other general topics related to microbiology. All technical documents are written in the CLSI-recommended format and may be incorporated into the users procedure manual. HUGO contains thousands of color photos depicting colony morphology and biochemical reactions on different types of culture media. In addition, HUGO™ v.7 also contains trade names and a generic cross-reference chart for all antimicrobials; how to comply with state, CLIA, CAP, HCFA, JCAHO

and OSHA requirements; current taxonomy changes; drug of choice listing with each pathogen; listing of common stock organisms and how to efficiently maintain them, and a complete description of each genus of bacteria and fungi of medical importance. HUGO™ v.7 contains an extensive glossary of microbiology, bacteriology, epidemiology, mycology, and parasitology terms and abbreviations. Also included is a directory with phone numbers and Web sites of organizations and agencies related to the microbiology laboratory. HUGO™ v.7 is fully searchable by category and keywords using an existing web browser or the browser supplied on the CD. HUGO™ v.7 can be loaded directly onto a PC's hard drive or may be run directly from the CD.

Hardy Diagnostics is an FDA-licensed and ISO 13485-certified manufacturer of medical devices for microbiological procedures in both clinical and industrial laboratories.

**Hardy Diagnostics**  
800.266.2222  
Santa Maria, CA  
www.HardyDiagnostics.com

## X-Ray Inspection System FAQs Addressed in New Webcast from Eriez®

**A** new 12-minute Webcast from Eriez® answers the most frequently asked questions about x-ray technology and highlights the company's E-Z Tec® X-Ray Inspection Systems. Narrated by Ray Spurgeon, Eriez X-Ray product manager, the

Webcast covers general information, features, how an x-ray cabinet system works, capabilities and safety and regulatory concerns.

Mr. Spurgeon talks about the main features required for a cabinet x-ray system to comply with FDA CFR 1020.40 Standards. He explains that these features include a light tower, emergency stop buttons, key lock, curtains, tunnel covers with dual interlocks and appropriate safety signage.

Mr. Spurgeon delivers a step-by-step account to describe how Eriez X-Ray Systems operate. Additionally, he discusses how x-ray energy and emissions are measured and how Eriez adaptive algorithms work. Several regulatory and safety procedures for industry professionals to consider are also mentioned.

"The purpose of producing this Webcast is to help take the mystery out of operating a cabinet x-ray system," says Mr. Spurgeon.

Advanced E-Z Tec X-Ray Inspection Systems employ linear array technology for superior sensitivity, speed and sophistication for both loose product flow and packaged inspection. E-Z Tec X-Ray Inspection Systems provide real-time analysis of process and packaged foods, pharmaceuticals and other goods requiring the highest levels of product integrity.

To view the Webcast visit, <http://en-us.eriez.com/Products/Xray/> and click on the "View Now" button.

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# COMING EVENTS

## NOVEMBER

- **2-4, Sweets Middle East**, Dubai International Convention and Exhibition Centre, Dubai, U.A.E. For more information, phone 971.4.308.6748; E-mail: sweetsmiddleeast@dwtc.com.
- **4-5, China International Food Safety & Quality Conference**, The Landmark Hotel & Towers, Beijing, P.R.C. For more information, go to [www.chinafoodsafety.com](http://www.chinafoodsafety.com).
- **5-7, Mexico Association for Food Protection Annual Meeting**, NH Krystal Hotel, Puerto Vallarta, Mexico. For more information, E-mail Alex Castillo at [a-Castillo@tamu.edu](mailto:a-Castillo@tamu.edu) or go to [inocuidad.cucei.udg.mx](mailto:inocuidad.cucei.udg.mx).
- **7-11, 137th APHA Annual Meeting and Exposition**, Philadelphia, PA. For more information, go to [www.apha.org/meetings](http://www.apha.org/meetings).
- **9-10, Advanced HACCP Training Course**, Ecolab Inc., Eagan, MN. For more information, contact Tatiana Lorca at [tatiana.lorca@ecolab.com](mailto:tatiana.lorca@ecolab.com).
- **9-11, 3rd Halal Expo**, Dubai, U.A.E. For more information, go to [www.worldhalalexpos.com](http://www.worldhalalexpos.com).
- **10-12, Sanitation Workshop**, Randolph Associates, Inc., Birmingham, AL. For more information, call 205.595.6455; E-mail: [kristy.clark@raiconsult.com](mailto:kristy.clark@raiconsult.com).
- **11-12, GlobalGap Tour 2009**, Athens, Greece. For more information, go to [www.globalgap.org](http://www.globalgap.org).
- **11-12, Implementing SQF 2000 Systems Training Course**, Ecolab Inc., Eagan, MN. For more information, go to [foodsafety@ecolab.com](mailto:foodsafety@ecolab.com).
- **11-13, 2009 EFFoST Annual Conference**, Budapest Hungary. For more information, go to [www.ffmpegconference.com](http://www.ffmpegconference.com).

- **11-13, IAFP Asia Pacific Symposium on Food Safety**, Seoul KyoYuk MunHwa HoeKwan Hotel, Seoul, South Korea. For more information, go to [www.iafpkorea.co.kr/main.asp](http://www.iafpkorea.co.kr/main.asp).
- **12, Developing Risk-based Food Safety Regulations**, University of Wisconsin-Madison Food Research Institute, Madison, WI. For more information, contact Kathy Glass at [kglass@wisc.edu](mailto:kglass@wisc.edu) or go to [www.fri.wisc.edu](http://www.fri.wisc.edu).
- **17-18, World Halal Forum Europe 2009**, World Forum Convention Centre, The Hague. For more information, go to [www.worldhalalforum.org](http://www.worldhalalforum.org).
- **18-20, HACCP: A Basic Concept for Food Protection**, New Brunswick, NJ. For more information, contact Jenna Kimock at [ocpe@njaes.rutgers.edu](mailto:ocpe@njaes.rutgers.edu).
- **18, Ontario Food Protection Association Annual Meeting**, Mississauga Convention Center, Mississauga, Ontario. For more information, contact Gail Seed at 519.463.6320 or visit [www.ofpa.on.ca](http://www.ofpa.on.ca).
- **19, Alabama Association for Food Protection Annual Meeting**, Marriott Hotel, Prattville, AL. For more information, contact G. M. Gallaspy at 334.206.5745 or [ggallaspy@adph.state.al.us](mailto:ggallaspy@adph.state.al.us).
- **24-27, VIII Workshop on Rapid Methods and Automation in Food Microbiology**, Barcelona, Spain. For more information, go to <http://quiro.uab.cat/workshopMRAMA>.

## DECEMBER

- **4, Turkish Food Safety Association, First Food Safety Congress**, Harbiye Military Museum and Cultural Center, Istanbul, Turkey.

For more information, go to [www.gidaguvenligikongresi.org](http://www.gidaguvenligikongresi.org).

- **7-10, Pasteurization Workshop**, Murfreesboro, TN. For more information, call 205.595.6455; E-mail: [kristy.clark@raiconsult.com](mailto:kristy.clark@raiconsult.com).
- **8-9, BRC Global Food Safety Standard Training Course**, San Antonio, TX. For more information, contact Wendy Harmon at 888.525.9788 ext. 262 or go to [www.food-safety.net](http://www.food-safety.net).
- **14-15, Advanced HACCP Training Course**, Ecolab Inc., Eagan, MN. For more information, contact Tatiana Lorca at [tatiana.lorca@ecolab.com](mailto:tatiana.lorca@ecolab.com).
- **16-17, Implementing SQF 2000 Systems Training Course**, Eagan, MN. For more information, contact Tatiana Lorca at [tatiana.lorca@ecolab.com](mailto:tatiana.lorca@ecolab.com).

## IAFP UPCOMING MEETINGS

AUGUST 1-4, 2010  
Anaheim, California

JULY 31-AUGUST 1, 2011  
Milwaukee, Wisconsin

JULY 22-25, 2012  
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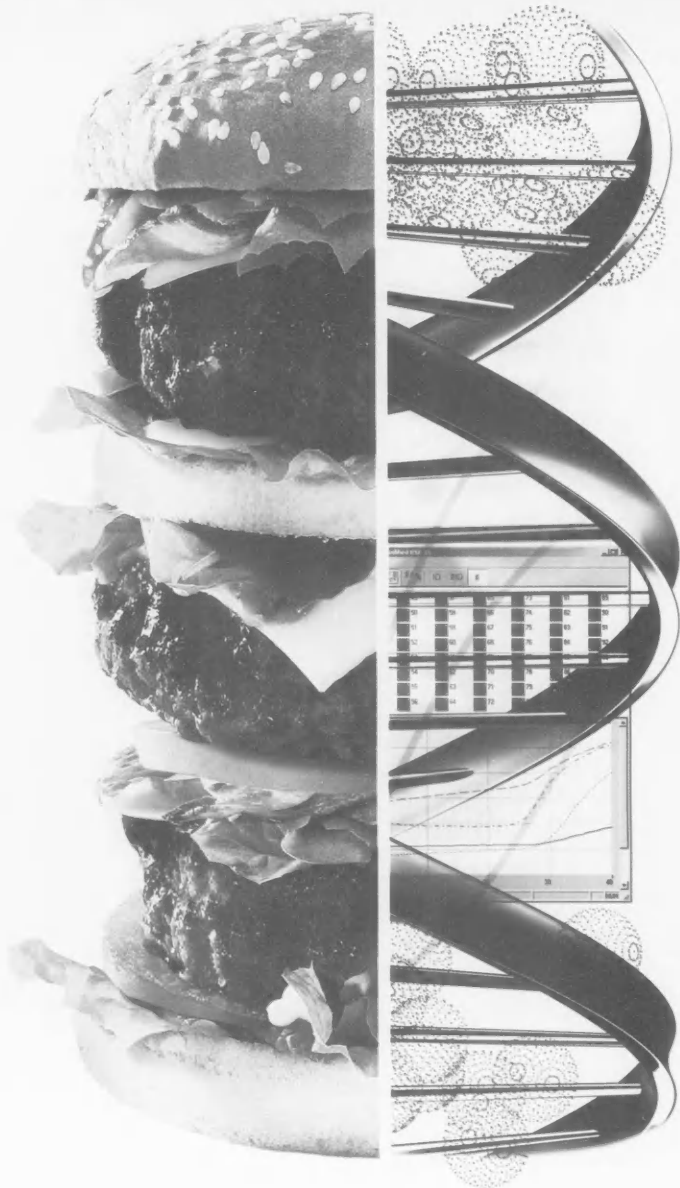
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