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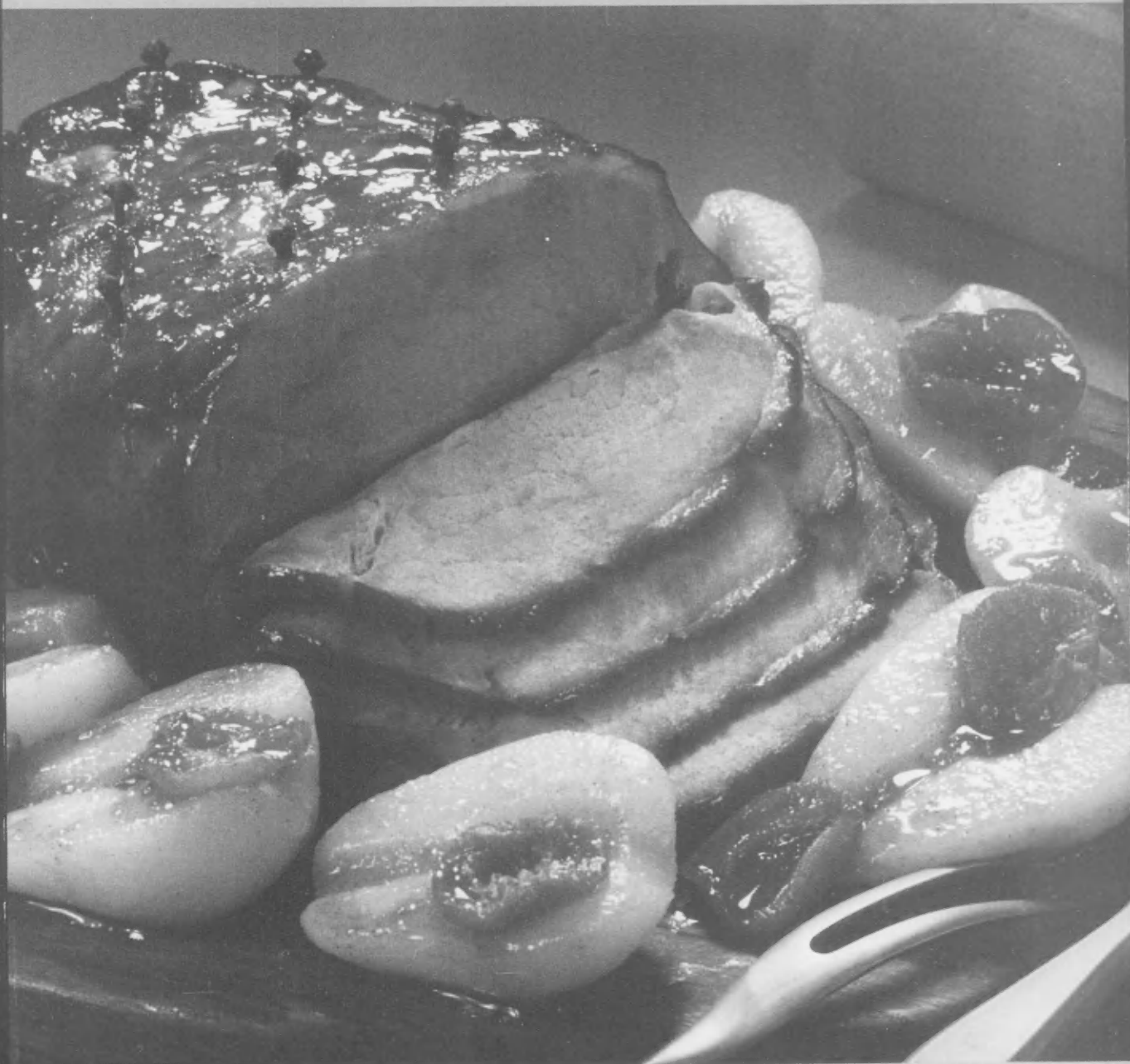
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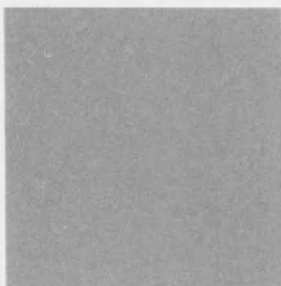
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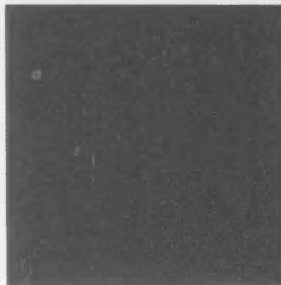
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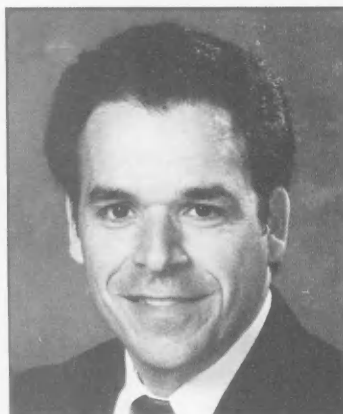
As I started to write this month's column, I performed an interesting exercise. I did an Internet search on the term *food safety management* using my favorite search engine. As you can imagine, I came up with numerous hits. Most of the sites I came across were related to food safety management systems, food safety management programs, and food safety management certifications. There were many.

I then performed a similar search using the term *food safety leadership* (instead of food safety management). The results were interesting. I came across a significant number of fewer sites and most were very different in content. They were mainly about awards and they were not very instructional.

This leads me to the topic of this month's message – *food safety leadership*.

It's interesting to note that in the field of food safety today, we often talk about food safety management. We rarely talk about food safety leadership. But management and leadership are different. According to leadership author Dr. John Maxwell, “the main difference between the two is that leadership is about influencing people to follow, while management focuses on maintaining systems and processes.”

Now please don't get me wrong. I am not being critical of food safety management systems, nor of effective food safety managers. We need them both and they are both absolutely critical to protecting public health. However, I am suggesting that in order to make dramatic reductions in the global burden of foodborne disease, food



By **FRANK YIANNAS**
PRESIDENT

**“Whether you're
a food safety
manager, a food
safety leader, or
hopefully both,
IAFP can be of
benefit to you”**

safety management is not enough. We also need food safety leadership.

Although there are numerous differences between food safety management and food safety leadership, let me summarize three important ones below.

1. Food safety management focuses on the administration of set procedures within an established risk management system; food safety

leadership focuses on the creation of new and enhanced risk reduction strategies, models, and processes. This quote by Stephen Covey illustrates this point quite well, “Management works in the system; leadership works on the system.” Food safety managers deal with planning, directing, and overseeing specific details of the system or program. Food safety leaders, in contrast, see the need for improvement, create a compelling vision for change, and inspire innovation, all which lead to even greater reductions in foodborne disease.

2. Food safety management relies on formal authority to accomplish its objectives; food safety leadership relies on the ability to influence others to achieve success. Food safety managers get others to follow them because they have authority over them or their operation. They get things done by holding people and organizations accountable. In contrast, food safety leaders get others to do the right things, not because they're being held accountable, but because they've been able to influence them to want to do so. They help others become responsible for food safety – not just accountable for food safety. There is a big difference between the two.

3. Food safety management involves working with others based on functional roles; food safety leadership involves working with others in a collaborative manner.

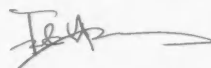
Food safety managers work with others in traditional ways to accomplish their goals. Often times, whether visible or not, they are protecting their organization's interests whether it be academia, regulatory, or industry. In contrast, food

safety leaders seek genuine win-win opportunities for all stakeholders. They recognize that they can do more to advance food safety by working with others than by working alone.

Whether you're a food safety manager, a food safety leader, or hopefully both, IAFP can be of benefit to you. By reading our journals and attending our meetings, you'll be exposed to the latest scientific findings and tomorrow's food safety solutions. Through our numerous networking opportunities, you can gain first-hand advice and collaborate

with leading experts from around the world. And by getting involved with our professional development groups and committees, you can sharpen your influence skills and make a difference.

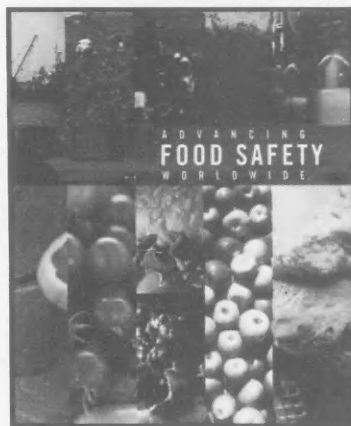
I encourage you to come join us and our members as we help lead the way in advancing food safety worldwide.



If you have any questions, comments, or suggestions, please let me know. You can E-mail me at frank.yiannas@disney.com. Until next month, thanks for reading.

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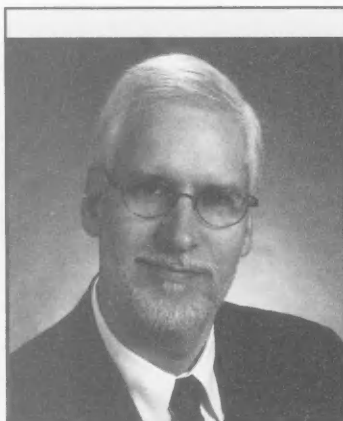


“COMMENTARY” FROM THE EXECUTIVE DIRECTOR

Rapid response. What is a rapid response and when should it be used? First, we need to define “rapid response” or at least provide background to what “rapid response” means to IAFF. You may have noticed in previous reports about IAFF’s future planning that we have discussed holding a “rapid response” symposium or conference in response to a recent issue in food safety. Our intent was to bring together experts and those involved with the issue to present information to stakeholders affected by the issue.

To answer the question, “when should it be used?” we can cite a couple of examples. First, I’ll provide an example of when it was not used. A little more than a year ago, avian influenza was spreading and the North American poultry flocks were directly at risk of being contaminated. This topic was discussed (many times and in many ways) by our task force along with the Executive Board, where it was determined that avian influence was not a food safety issue. Yes, it well could be devastating to the poultry industry and it could affect poultry workers, but it was unlikely that avian influence would be transmitted through the food supply. In this case, the decision was that this topic did not warrant a “rapid response” session by IAFF.

Next, for the more exciting example of when it should be used, we will review the evolution of a “Rapid Response Symposium.” As an IAFF Member, toward the end of September and begin-



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

***“What is
a rapid
response and
when should
it be used?”***

ing of October, you received a number of E-mail notifications about our first Rapid Response Symposium. This symposium was held on October 6 in Arlington, Virginia just three weeks after FDA’s order to the public to not consume spinach due to a death linked to *E. coli* found in bagged spinach.

The FDA’s order was issued late in the day on September 14.

Publicity spread on Friday, the 15th and by the end of the day, spinach was gone from store shelves and menus across the country. As this took place, there was a series of communications between our task force, Gale Prince, Bob Buchanan and Mike Doyle that was initiated by our Past President Kathy Glass. The discussion addressed whether this was a topic that warranted holding IAFF’s first Rapid Response Symposium. The task force response was “yes,” they felt it was worthy of planning a symposium. Kathy graciously bowed out of the planning, as she was the chair of the task force through August, when Jeff Farber then took over.

The recommendation then went forward to the Executive Board who also agreed that the topic was one of extreme interest to our Members. By Monday, our current Past President, Jeff Farber and President, Frank Yiannas had developed a tentative program. As we moved forward during the first week, IAFF consulted with United Fresh Produce Association and the National Restaurant Association regarding the program topic and content. A small number of other individuals were consulted and asked to review the program for completeness and topic content. Linda Harris at the University of California-Davis was recruited to help contact and confirm speakers. By the end of week one, we had a tentative program completed and all speakers had been invited. At this point, the E-mail notice to IAFF Members was sent. One week

after the product freeze, and IAFP had developed a symposium to bring food safety leaders together for a face-to-face discussion! The symposium was titled, "Fresh Leafy Greens – Are They Safe Enough?"

As the second week evolved, the program was revised (many times I might add) and by the end of the week, we had a solid program set. Another E-mail was sent to Members inviting attendance. Registrations came in, as did a number of sponsorships. The following companies and organizations recognized the importance of this symposium by

providing sponsorship monies: bioMérieux, DuPont Qualicon, Ecolab, National Restaurant Association and their Educational Foundation, Silliker and the Technical Committee on Food Microbiology from the International Life Sciences Institute, North America. We were delighted to receive support from each and every contributing organization!

Well, we had just more than 100 at the symposium and were very satisfied with our first attempt at holding a rapid response symposium. Our target for success was set at 80 attendees,

so exceeding this was exciting. Attendees voiced overall satisfaction and were complementary about IAFP's involvement in holding this symposium.

Did we learn some things along the way? You can imagine we did! Our post symposium review gave us a number of things to take forward and learn from if or when IAFP plans its second "Rapid Response Symposium." We hope that you, as an IAFP Member, see this as another way that IAFP is showing leadership in food safety. We felt this falls directly under IAFP's mission and our motto of "Advancing Food Safety Worldwide!"

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Older Adults' Knowledge, Attitudes, and Practices Regarding Listeriosis Prevention

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SUMMARY

Older adults can reduce their risk of contracting listeriosis from consumption of deli meats by keeping their refrigerator at 40°F or below and storing deli meats for the recommended time or less. In this exploratory study, we distributed a fact sheet on listeriosis prevention to 48 adults 60 years of age or older. We assessed participants' food safety knowledge, attitudes, and practices before and after receiving the fact sheet. The subjects participated in focus groups to discuss their impressions of the fact sheet, whether they had made any changes based on the information provided, and barriers to adopting the recommended practices. Before the study, most participants had not heard of *Listeria* and were unaware of prevention practices for listeriosis. Participants' awareness of *Listeria*, potential food sources, and recommended prevention practices, as well as their understanding that older adults are at relatively high risk for listeriosis, increased after receiving the fact sheet. Adoption of the recommended practices was not widespread, because many participants were not concerned about contracting listeriosis. Reaching older adults with multiple messages on listeriosis prevention through multiple delivery mechanisms will help to increase awareness and adoption of the recommended practices.

A peer-reviewed article

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INTRODUCTION

Consumption of food contaminated with *Listeria monocytogenes* can cause listeriosis (26). Approximately 2,500 Americans contract listeriosis each year; of these, one out of five dies from the illness, making *L. monocytogenes* the second most common cause of death among foodborne pathogens (5, 16). Recent FoodNet data from the Centers for Disease Control and Prevention (CDC) show encouraging declines in the prevalence of listeriosis in humans, meeting national health goals for 2010 (6). Pregnant women and their fetuses, neonates, older adults, and individuals with weakened immune systems are most susceptible to contracting listeriosis (20).

Refrigerated ready-to-eat (RTE) foods, such as frankfurters, deli meats, seafood salads, and soft cheeses, have been associated with human listeriosis and are known to support the growth of *L. monocytogenes* (10, 21, 24). The pathogen is highly resistant to adverse environmental conditions and can grow at refrigeration temperatures (22). The US Department of Agriculture (USDA) has a zero tolerance for *L. monocytogenes* in cooked and RTE meat and poultry products (9 CFR 430.4) (12); however, com-

plete elimination of *L. monocytogenes* remains a challenge for RTE food manufacturers.

A quantitative risk assessment that focused on consumer food handling revealed that the most important factor in the risk of listeriosis from consuming deli meats is the amount of *L. monocytogenes* already present in the product at the time of purchase. Other risk factors included refrigerator temperature and storage time (34). These results are similar to the findings from a ranking of the relative risk to public health from foodborne *L. monocytogenes* among selected categories of RTE foods conducted by the Food and Drug Administration, USDA, and the Centers for Disease Control and Prevention (30).

Because adults 60 years or older are more likely than the general population to have severe complications from listeriosis and other microbial foodborne illnesses (3), this subpopulation warrants special consideration regarding communicating the risks of listeriosis and ways to mitigate these risks. Older adults are at an increased risk of complications from foodborne illness because of decreased immune functioning; decreased stomach acid production (a natural defense against foodborne pathogens); and increased use of antibiotics, antacids, and antimotility drugs (3, 7, 27).

To evaluate the effectiveness of educational materials in increasing knowledge and use of the recommended practices for listeriosis prevention, we conducted pre- and post interviews and focus groups with 48 adults 60 years or older. The educational information was presented in a one-page fact sheet, printed front and back (Fig. 1). Consistent with the aforementioned risk assessment (34), the fact sheet provided information on two specific practices for reducing the risk of listeriosis from deli meat consumption: (1) use of a refrigerator thermometer to ensure that the home refrigerator is at 40°F or below, and (2) storage of deli meats for the recommended time or less.

The purpose of the interviews was to collect quantitative data on participants' food safety knowledge, attitudes, and practices before and after receiving the fact sheet. We analyzed the pre- and post-questionnaire data to measure any changes in participants' food safety knowledge, attitudes, and practices as the result of receiving the fact sheet. The purpose of the focus groups, conducted approximately 1 month after receipt of the fact sheet, was to obtain qualitative information on participants' impressions of the

fact sheet, whether they had made any changes based on the information provided, and possible barriers to adopting the recommended practices. By combining the interview data with the findings from the focus groups, we obtained a better understanding of the reasons why participants did and did not adopt the recommended practices for listeriosis prevention.

Focus groups are often used for developing and testing health communication messages (23, 32). A focus group generally consists of 8 to 10 participants who discuss selected topics with a moderator for approximately 1 to 2 hours. The moderator introduces topics and serves as the discussion facilitator (14). Because focus group data provide direction and useful insight on the topics of interest, focus groups are particularly useful in studies in which the research is exploratory in nature, such as this one, although the findings cannot be generalized to the target population because participants are not randomly selected and therefore are not representative of the population (15). Thus, the findings reported here should be considered in a qualitative frame of reference.

METHODS

Focus groups

We conducted six focus groups with adults 60 years or older in Raleigh, North Carolina, in August 2005. RTI International's (RTI's) Committee for the Protection of Human Subjects, which serves as RTI's Institutional Review Board (IRB), reviewed and approved the study protocol. Using convenience sampling, a market research firm recruited participants from their database who met the following eligibility criteria: were 60 years or older, had primary or shared responsibility for grocery shopping and cooking in their households, prepared food and cooked at home at least three times a week, and ate deli meats at home at least once a week. Additionally, so that we could measure behavioral change, we recruited individuals who did not own a refrigerator thermometer and who stored deli meats for longer than the recommended storage time. Each focus group consisted of eight individuals, for a total of 48 participants, and included a mix of men and women of different races. As suggested by Greenbaum (14), we segmented the groups by education to increase homogeneity of the groups and

improve participation. We conducted three focus groups with individuals with a high school education and three focus groups with individuals with a college education.

Individuals recruited for the focus groups completed a questionnaire by telephone to measure their baseline food safety knowledge, attitudes, and practices. We then asked them to read the information provided in a fact sheet on listeriosis prevention, a copy of which was mailed to each individual. In developing the fact sheet, we reviewed government food safety educational materials (29, 31). Approximately 4 weeks later, the same individuals participated in focus group discussions. Before each discussion, participants completed a written questionnaire to measure their food safety knowledge, attitudes, and practices after exposure to the fact sheet.

Two trained moderators conducted each focus group. Each focus group started with a general discussion on food safety. Focus group participants discussed their knowledge of food safety, their interest in food safety, and their concerns about contracting foodborne illness. The moderators then led participants in a discussion to identify any changes in their knowledge, attitudes, and food safety practices after receiving the fact sheet on listeriosis prevention. Participants also discussed possible barriers to following the recommended practices for listeriosis prevention.

The moderator introduced a third recommendation for listeriosis prevention that was not included in the fact sheet and asked how likely participants would be to follow the recommendation. This recommendation was stated in the focus groups as follows: "Because of the possible risk of foodborne illness, USDA recommends that older adults reheat deli meats to steaming hot before eating. If reheating is not possible, then USDA recommends that older adults should not eat deli meats" (31).

The market research firm videotaped and audio recorded each focus group discussion, and each discussion was professionally transcribed. The moderators reviewed the videotapes and transcriptions to prepare a four- to five-page detailed summary of each focus group. We systematically analyzed the detailed summaries to identify common themes within and across groups and any exceptions to these trends (15). Because the number of participants in each segment (high school versus college educated) was small, we did not analyze the results by education level.

Older Adults and Listeriosis: How to Protect Yourself



Research studies have shown that older adults handle food more safely than any other age group. During your lifetime, however, a lot has changed in the way food is produced, distributed, prepared, and eaten. Also, researchers have discovered new bacteria in food that we didn't know previously existed. Researchers have discovered food related illnesses caused by these bacteria, determined the risk associated with these illnesses, and identified practices to prevent illness.

Why should I be concerned?

As your body changes with age, you become more at-risk for foodborne illness. Your immune system weakens and may become less able to rid your body of bacteria. In addition, your body makes less stomach acid, which is a natural defense against bacteria in food. Also, your senses of taste and smell may lessen, so you may not always be able to tell whether meat has spoiled or milk has soured. Furthermore, some illnesses, such as diabetes and some cancer treatments, may increase your risk of illness. As a result, it's important to know and follow safe handling practices to protect yourself from illnesses caused by harmful bacteria in food.



Of particular concern is *Listeria* (Lis-'tir-ē-a), a foodborne bacterium that can cause a disease called listeriosis (lis-'tir-ē-ō-ses). Unlike most foodborne bacteria, *Listeria* can grow at refrigerator temperatures. *Listeria* can be found in pre-cooked refrigerated foods, such as prepackaged or freshly sliced deli (luncheon) meats, hot dogs, deli salads, and other pre-cooked meat and poultry products. According to the Centers for Disease Control and Prevention (CDC), approximately 2,500 Americans get listeriosis each year. Of these, 1 out of 5 dies from the illness. Older adults are at high risk for getting listeriosis if they eat foods contaminated with *Listeria*.

How does *Listeria* get into my food?



Although most pre-cooked refrigerated foods are not contaminated with *Listeria*, a very small percentage can become contaminated at the manufacturing plant or grocery store. *Listeria* can spread and grow on surfaces where food is manufactured or processed. If deli meats are contaminated with *Listeria* at time of purchase, the *Listeria* can grow very rapidly if stored at an unsafe temperature.

The effects of listeriosis can be devastating. Here is one family's story.

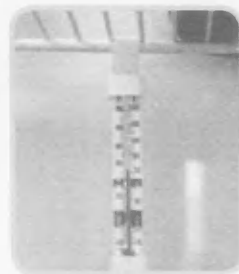
"Last year, my husband — who was 70 years old at the time — had a high fever and complained of bad headaches. The pain was so severe that I rushed him to the emergency room. The doctor told me he had bacterial meningitis, which is an infection and inflammation of the membranes and fluid surrounding the brain and spinal cord. He was treated with antibiotics and hospitalized for over two weeks, including a short stay in intensive care. The doctor said the cause of his infection was *Listeria*, a bacterium that can be found in pre-cooked, refrigerated foods. The state health department eventually traced the *Listeria* to the deli meats served at one of our weekly bridge games. The doctor said he was lucky because some people die from the illness. Before this, I had no idea that deli meats could make you so sick."

What can I do to prevent listeriosis?

Researchers have found that the most important factor contributing to the increased risk of listeriosis from eating deli meats is the amount of *Listeria* already present in the product when it's purchased by the consumer. Because you cannot tell if deli meats are contaminated with *Listeria* when purchased, it's important to always safely handle and store deli meats. **By following two simple practices (described below), you can reduce your risk of listeriosis from eating deli meats by more than 50 percent.**

Keep your refrigerator's temperature at 40°F or lower.

To make sure your refrigerator is at a safe temperature (40°F or lower), use a refrigerator thermometer. A refrigerator thermometer is not the thermostat inside your refrigerator. It is a different tool that stays in your refrigerator and displays the actual temperature (see picture). If your refrigerator's temperature is not safe, use the thermostat (the numbered dial) to adjust the temperature. Refrigerator thermometers are sold at grocery, discount, and hardware stores.



Store deli meats for the recommended time or less (see chart). Buy only as much deli meats as you and your family can eat

within the recommended time frame. After opening a package of deli meats, eat the remaining product as soon as you can.

	Eat or discard within
Unopened packages of deli meats	14 days
Opened packages of deli meats	3 to 5 days
Freshly sliced deli meats	3 to 5 days

For more information on how to protect you and your family from foodborne illness, call the USDA Meat & Poultry Hotline (1-888-MPHotline) or visit www.fsis.usda.gov.

TABLE 1. Participants' Demographics

	Percentage of participants (number of responses)
Gender	
Male	47.9 (23)
Female	52.1 (25)
Age	
60–64	29.2 (14)
65–69	31.3 (15)
70–74	29.2 (14)
75–79	6.3 (3)
80 or older	4.2 (2)
Living situation	
Living alone	31.3 (15)
Two people	52.1 (25)
More than two people	14.6 (7)
No response	2.1 (1)
Race/ethnicity	
White, non-Hispanic	64.6 (31)
Black, non-Hispanic	31.3 (15)
Hispanic	4.2 (2)
Education	
Less than high school degree	4.2 (2)
High school graduate or GED	12.5 (6)
Some college or 2-year college degree	35.4 (17)
4-year college degree	22.9 (11)
Postgraduate degree	25.0 (12)
Household income	
Less than \$12,000	2.1 (1)
\$12,000–\$24,999	10.4 (5)
\$25,000–\$49,999	39.6 (19)
\$50,000–\$74,999	10.4 (5)
\$75,000–\$100,000	12.5 (6)
More than \$100,000	8.3 (4)
No response	16.7 (8)
Perceived health status	
Excellent	10.4 (5)
Very good	52.1 (25)
Good	29.2 (14)
Fair	4.2 (2)
Poor	2.1 (1)
No response	2.1 (1)
Participant or household member had foodborne illness in past year	
Yes	16.7 (8)
No	83.3 (40)

Analysis of pre- and post-questionnaire data

We assessed changes in participants' food safety knowledge, attitudes, and practices after receiving the fact sheet by calculating the percentage of participants who reported the knowledge, attitude, or practice in the pre- and post-questionnaires, and then calculating the difference. Because the sample size is small, we report both the number of responses and the percentages. The analysis was conducted using SAS version 8 (25).

Changes in food safety knowledge and attitudes

The pre- and post-questionnaires collected information on participants' general knowledge of food safety, interest in learning more about food safety, and level of concern about contracting foodborne illness. To measure changes in these constructs, we collapsed the response items into three categories: (1) not at all/not very, (2) somewhat, and (3) very. We defined an increase in the construct as moving from response category 1 to 2, 1 to 3, or 2 to 3. Conversely, we defined a decrease in the construct as moving from response category 3 to 2, 3 to 1, or 2 to 1.

To measure whether participants believed they are at an increased risk for foodborne illness because of their age, we asked how strongly they agree or disagree with the following statement: "Because of my age, I am at an increased risk of getting food poisoning or foodborne illness from the food I eat at home." To measure changes in this construct, we collapsed the response items into two categories: (1) disagree or strongly disagree and (2) agree or strongly agree. We defined an increase in this construct as moving from response category 1 to 2.

The questionnaires also collected information on participants' awareness of *Listeria* (participants selected the pathogens they had heard of from a list of pathogens); knowledge of processed meats, such as deli meats and frankfurters, as possible food sources for *Listeria* (open-ended response for pre-questionnaire, participants selected response(s) from list of food sources for post-questionnaire); and knowledge of safe refrigerator temperature (open-ended response).

To collect information on knowledge of the recommended storage times for deli meats, we asked participants in the post-questionnaire to identify the recommended storage time for unopened

TABLE 2. Changes in food safety knowledge and attitudes after exposure to the fact sheet on listeriosis prevention

	Percentage of Participants (number of responses)	
	Pre-questionnaire	Post-questionnaire
Knowledgeable about food safety		
Not at all/not very	4.3 (2)	8.5 (4)
Somewhat	57.4 (27)	70.2 (33)
Very	38.3 (18)	21.3 (10)
Interested in learning more about food safety		
Not at all/not very	4.3 (2)	0.0 (0)
Somewhat	23.4 (11)	14.9 (7)
Very	72.3 (34)	85.1 (40)
Level of concern about contracting foodborne illness from food prepared at home		
Not at all/not very	42.6 (20)	40.4 (19)
Somewhat	23.4 (11)	27.7 (13)
Very	34.0 (16)	31.9 (15)
Believe that he/she is at an increased risk for foodborne illness because of age	41.3 (19)	67.4 (31)
Aware of <i>Listeria</i>	33.3 (16)	58.3 (28)
Identified processed meats as food source for <i>Listeria</i> [If aware of <i>Listeria</i>]	0.0 (0)	89.3 (25)
Know safe refrigerator temperature (40°F or lower)	29.2 (14)	58.3 (28)
Know recommended storage time for unopened packages of vacuum-packed deli meats (14 days or less)	— ^a	66.0 (31)
Know recommended storage time for opened packages of vacuum-packed deli meats (5 days or less)	— ^a	51.1 (24)
Know recommended storage time for freshly sliced deli meats (5 days or less)	— ^a	55.3 (26)

^aQuestion was not asked in the pre-questionnaire.

and opened packages of vacuum-packed deli meats and freshly sliced deli meats. Participants selected the number of days from a list of responses.

Changes in food safety practices

The pre- and post-questionnaires collected information on refrigerator thermometer ownership and the storage time for the most recently purchased package of deli meats. We also included questions in the post-questionnaire to determine the stage of change participants were in with respect to the two recommendations for listeriosis prevention. The Stages of Change

model categorizes people according to their stage of readiness concerning a recommended behavior: precontemplation, contemplation, preparation, action, and maintenance (19).

Demographic and other questions

The post-questionnaire collected information on participants' demographics (e.g., gender, age, and education) and health status. The questionnaire also collected information on whether the respondent or a household member had contracted a foodborne illness in the past year. Table 1 summarizes this information.

RESULTS

Changes in food safety knowledge and attitudes

Table 2 summarizes participants' food safety knowledge and attitudes before and after receiving the fact sheet on listeriosis prevention.

Participants considered themselves to be somewhat knowledgeable about food safety, but they doubted their knowledge after reading the fact sheet. Many participants were surprised and concerned that they were not previously aware of the information on listeriosis prevention. Comparing the pre and post data, 23 per-

cent of participants rated themselves as less knowledgeable after receiving the fact sheet. One participant said, "I thought I was knowledgeable until I got the sheet and read about *Listeria*, which I (had) never heard of." Other participants shared this concern.

In the post-questionnaire, 21 percent of participants described themselves as very knowledgeable about food safety, and 70 percent described themselves as somewhat knowledgeable. Most participants expressed confidence in their food safety practices. They believed that they knew enough to handle and prepare food safely at home and reported the use of good hygiene practices and practices to prevent cross contamination. However, some participants revealed that they unknowingly follow some unsafe practices when preparing food at home, such as washing meats and poultry before cooking, which can lead to cross contamination; mishandling leftovers; and defrosting meat and poultry at room temperature.

Participants expressed a strong interest in learning more about food safety. In the post-questionnaire, 85 percent of participants described themselves as very interested in learning more about food safety. Comparing the pre and post data, 17 percent of participants rated themselves as being more interested in learning more about food safety after receiving the fact sheet. Participants reported that they would like to know more about recommended storage times for refrigerated and frozen foods, product dating, and foodborne bacteria and illnesses.

Participants had differing levels of concern about contracting foodborne illness from food prepared at home. Comparing the pre and post data, 13 percent of participants rated themselves as more concerned, 17 percent rated themselves as less concerned, and 70 percent had no change in their response after receiving the fact sheet.

In the post-questionnaire, 32 percent of participants described themselves as very concerned about contracting foodborne illness from food prepared at home. Some of these participants prepare food for people who are more susceptible to foodborne illness because of other illnesses (e.g., leukemia or diabetes); thus, they are very cautious when preparing food at home. Some participants have had experience with foodborne illness (either getting sick themselves or having a family member contract foodborne illness) and want to prevent a repeated experience. Others doubted their ability to always handle and prepare food safely at home. As one participant stated, "I'm very

concerned because I stretch the limits. I know I'm pushing it. I pray I don't get sick."

Twenty-eight percent of participants described themselves as somewhat concerned about contracting foodborne illness from food prepared at home, while 40 percent said they are not at all or not very concerned. Some participants are not very concerned because they have never had a foodborne illness and thus think it is unlikely they will contract foodborne illness in the future. As one participant stated, "I am 66 years old, and it (food poisoning) hasn't happened yet." Many participants are more concerned about how food, especially meat and poultry, is handled by retailers and grocery stores.

Knowledge that older adults are an at-risk population for foodborne illness

Before receiving the fact sheet, 41 percent of participants agreed or strongly agreed with the statement, "Because of my age, I am at an increased risk of getting food poisoning or foodborne illness from the food I eat at home." After receiving the fact sheet, 67 percent of participants agreed or strongly agreed with this statement. Comparing the pre and post data, 37 percent of participants moved from disagreeing to agreeing with this statement, suggesting that the fact sheet may have educated these participants that older adults are at an increased risk for foodborne illness.

In the focus group discussions, most participants understood that, in general, older adults are more susceptible to contracting foodborne illness because of their weakened immune systems. They also believed, however, that older adults have safer food handling and consumption practices compared to younger adults, thus reducing their risk of contracting a foodborne illness. In addition, many participants believed that not all older adults, including themselves, are at risk for foodborne illness. They believed that older adults who have limited education or income, live alone, suffer from other illnesses, or are much older are at a greater risk for foodborne illness.

Knowledge of *Listeria* and food sources

Before receiving the fact sheet, 33 percent of participants had heard of *Listeria* but admitted in the focus groups that they had little or no knowledge about the foodborne pathogen and could not recall

where they had heard about it. After receiving the fact sheet, 58 percent of participants had heard of *Listeria*—a 38 percent increase.

Before receiving the fact sheet, no participants identified processed meats as a food source for *Listeria*. After receiving the fact sheet (which identified deli meats and other processed meat and poultry products as foods that could contain *Listeria*), 89 percent of participants who had heard of *Listeria* correctly identified processed meats as a food source for the bacterium.

The fact sheet sparked curiosity in some participants and motivated them to want to learn more about *Listeria* and listeriosis. In four of the six groups, one or more participants said they sought out additional information after reading the fact sheet by searching the Internet, visiting USDA's Web site (the address was provided on the fact sheet), or asking a health care professional for more information.

Knowledge of safe refrigerator temperature and recommended storage time guidelines for deli meats

Before receiving the fact sheet, 29 percent of participants knew that the safe refrigerator temperature was 40°F or below. After receiving the fact sheet (which identified the safe refrigerator temperature), 58 percent knew this information—a 41 percent increase.

The fact sheet provided the recommended storage time guidelines for deli meats. On the post-questionnaire, 66 percent of participants correctly identified the recommended storage time for unopened packages of vacuum-packed deli meats (14 days or less). About half of participants correctly identified the recommended storage time for opened packages of vacuum-packed deli meats and freshly sliced deli meats (5 days or less).

Changes in food safety practices

Table 3 summarizes participants' use of the recommended practices for listeriosis prevention after receiving the fact sheet. Adoption of the recommended practices was not widespread.

Use of refrigerator thermometers

Before receiving the fact sheet, no participants used a refrigerator thermometer to check whether their refrigerator

TABLE 3. Food safety practices after exposure to the fact sheet on listeriosis prevention

	Percentage of Participants (number of responses)
Use of refrigerator thermometer during 4-week evaluation period	
Have not at all considered purchasing refrigerator thermometer	41.7 (20)
Have thought about purchasing refrigerator thermometer but have not done so yet	31.3 (15)
Have not purchased refrigerator thermometer but plan to buy one the next time shop at grocery or discount store	14.6 (7)
Have purchased refrigerator thermometer and found that refrigerator was at a safe temperature	10.4 (5)
Have purchased refrigerator thermometer and found that refrigerator was not at a safe temperature so adjusted thermostat	2.1 (1)
Use of recommended storage time guidelines for opened packages (vacuum-packed) and freshly sliced deli meats during 4-week evaluation period	
Have not at all considered following recommended guidelines	12.5 (6)
Have thought about following recommended guidelines but have not done so yet	18.8 (9)
Have not followed recommended guidelines but plan to in the future	12.5 (6)
Have followed recommended guidelines some of the time	8.3 (4)
Have followed recommended guidelines most of the time	35.4 (17)
Have followed recommended guidelines all of the time	12.5 (6)
Stored most recent purchase of deli meats for the recommended time or less, during 4-week evaluation period (for participants purchasing product)	
Unopened vacuum-packed deli meats	92.9 (26)
Opened vacuum-packed deli meats	37.9 (11)
Freshly sliced deli meats	58.8 (10)
Likelihood of following recommendation for reheating deli meats to steaming hot before eating (or not eating if reheating is not possible)	
Not at all likely/not very likely	41.7 (20)
Somewhat likely	20.8 (10)
Very likely	37.5 (18)

was at a safe temperature. Even after receiving the fact sheet, 42 percent of participants were in the precontemplative stage of the Stages of Change model; that is, they had not at all considered purchasing a refrigerator thermometer. Thus, the fact sheet did not motivate these participants even to consider purchasing a refrigerator thermometer.

Thirty-one percent were in the contemplative stage; that is, they had considered buying a refrigerator thermometer but had not done so yet. In addition, 15 percent were in the preparation stage; that is, they were planning to buy a refrigera-

tor thermometer the next time they went shopping. Most participants in this stage of change agreed it was important to monitor the temperature inside their refrigerators. One participant said, "It's a good idea. It's the only way to be sure (that your refrigerator is kept at a safe temperature)," and another participant said, "Refrigerators are designed in such a way that you have no idea what temperature you're setting your refrigerator at when you turn (the thermostat) to A, B, C, D, E or 1, 2, 3, 4, 5. Those numbers are meaningless."

Six of the 48 participants (12 percent) started using a refrigerator thermometer after receiving the fact sheet (two participants purchased a new thermometer, and four participants "dug one out of the drawer"). A few participants said they turned down the thermostat in their refrigerators as a safety precaution after reading the fact sheet. Several participants said they were waiting until after the focus group to decide whether to purchase a refrigerator thermometer and were glad to hear they would receive a refrigerator thermometer for participating in the focus group.

Despite the fact sheet's recommendation, some participants said that they were unlikely to purchase and start using a refrigerator thermometer. Some participants considered refrigerator thermometers unnecessary because they believe their refrigerators keep food at a safe temperature. As one participant stated, "As long as my beer is cold, I know my refrigerator is working." Other barriers to using a refrigerator thermometer included distrust in the accuracy of refrigerator thermometers, participants' belief that they do not store refrigerated foods longer than recommended, and a general lack of concern about contracting foodborne illness.

To encourage the use of refrigerator thermometers, some participants suggested that the government should educate consumers about refrigerator thermometer usage; the government should require refrigerator manufacturers to include a refrigerator thermometer as part of the product design; and refrigerator thermometers should be prominently displayed in grocery stores (e.g., in the frozen and refrigerated food sections), home improvement stores, and houseware stores.

Adherence to recommended storage time guidelines

Before receiving the fact sheet, no participants were following the recommended storage time guidelines (5 days or less) for opened packages of vacuum-packed deli meats and freshly sliced deli meats, but all participants were following the recommended guidelines (14 days or less) for unopened packages of vacuum-packed deli meats.

After receiving the fact sheet, 13 percent of participants were in the precontemplative stage of the Stages of Change model; that is, they had not at all considered following the recommended storage time guidelines for deli meats. Nineteen percent were in the contemplative stage; that is, they had considered following the guidelines but had not yet done so. Additionally, 13 percent were in the preparation stage; that is, they plan to follow the guidelines in the future. About 56 percent of participants reported they had been following the recommended guidelines all, some, or most of the time since receiving the fact sheet.

We also directly assessed participants' adherence to the guidelines by asking participants about storage time for their most recent purchase of deli meats. Nearly all participants (93 percent) stored unopened packages of vacuum-packed deli

meats for the recommended time or less, although 100 percent reported following the recommended guideline before receiving the fact sheet. Thirty-eight percent stored opened vacuum-packed deli meats for the recommended time or less, and 59 percent stored freshly sliced deli meats for the recommended time or less.

As suggested by the fact sheet, some participants said that they plan to buy smaller amounts of deli meats that can be consumed within the recommended time. Also, some participants plan to store unopened packages of deli meats in the freezer instead of the refrigerator to prolong the shelf life. In three of the six focus groups, one or more participants had already stopped or planned to stop eating deli meats because of concerns about contracting listeriosis. However, we have no way of ascertaining how long these attitudes will persist.

Despite the fact sheet's suggestion to follow the recommended storage time guidelines, some participants said that they are unlikely to follow the guidelines in the future because they either store deli meat for less than 1 week, which they consider a safe amount of time, or they follow the date on the product (e.g., use-by date) for storage time guidance.

Some participants did not perceive the risk of listeriosis to be great enough to warrant special precautions even though the fact sheet included information from CDC on the morbidity and mortality rates for listeriosis. Participants' general opinion was that the number of listeriosis cases each year (2,500) is a very small percentage of the total US population; thus, most participants were not very concerned about contracting listeriosis. In all six groups, however, one or more participants noted the mortality rate was quite high (one in five) and a cause for concern. One participant voiced her concern by stating, "Well, I think...the mortality rate is high. I wouldn't want to be one of those five. I have a son who has autism, and that's a very rare occurrence, and I know that these things can happen."

Recommendation to reheat deli meats to steaming hot

Participants had mixed opinions on whether they would follow the recommendation to reheat deli meats to steaming hot. In the post-questionnaire, 38 percent said they would be very likely to follow the reheating recommendation because of concerns about contracting listeriosis. One participant said, "I think I

would (follow the recommendation). I have no trouble with it (deli meat) being hot, and I think I better start." Another participant said, "I (have) never done it (reheated deli meat), but I guess I'll try it next time ... if that's what they (USDA) say." Several participants said they would consider following the recommendation for deli meats that are sometimes eaten hot (e.g., pastrami) but not for deli meats that are typically served cold (e.g., turkey). Before this study, at least one participant in two of the six groups sometimes reheated deli meats because of food safety concerns.

In the post-questionnaire, 21 percent said they would be somewhat likely and 42 percent said they would be not at all or not very likely to follow the reheating recommendation. Participants thought it would be inconvenient to reheat deli meats and were concerned that reheating deli meats would alter the taste, texture, and color of the meat. Participants did not believe this precaution was necessary because of the low mortality rate for listeriosis and doubted that many people would follow the recommendation. One participant summed up the feelings in the group by stating, "I'm willing to take the risk (by not reheating)."

Some participants were very surprised they had not previously heard of the recommendation to reheat. One participant asked, "Is it (the recommendation) being put out to the public? I haven't heard about it. We have to know in order to make a decision." Some participants believe that if the recommendation is important, then the government needs to educate older adults and make them aware. As one participant stated, "The government is obligated to tell the public, and it is then our choice whether or not to follow."

DISCUSSION

This study identified the need to educate older adults about the risks of listeriosis and the recommended practices for listeriosis prevention. Before being contacted for this study, most participants had not heard of *Listeria* and listeriosis and were unaware of possible food sources and prevention practices. Similarly, a recent national survey of US adults found that 44 percent had heard of *Listeria* while 94 percent had heard of *E. coli* and *Salmonella*. Furthermore, in the same survey, awareness of *Listeria* was lower among individuals 60 years of age or older (4).

Participants' awareness of *Listeria*, knowledge of potential food sources and recommended prevention practices, and the understanding that older adults are at greater risk for contracting listeriosis increased after they received the fact sheet. Although participants received the fact sheet 4 weeks before the focus group discussion, about 40 percent of participants could not recall or had never learned the safe refrigerator temperature, and about half could not recall the recommended storage times for deli meats. Nearly all participants indicated that they read the fact sheet upon receipt, and some said they read it again before the focus group discussion. Although participants read the fact sheet, it appears they may not have learned or retained certain pieces of information. Research has shown that older adults do not remember recent experiences and information as well as younger adults because of changes in the functioning of neural systems that support these memory processes (13, 28). Thus, reading or hearing the message only once may not be sufficient for retaining the message. Therefore, there is the need to reach the target population with multiple messages on listeriosis prevention through multiple delivery mechanisms. National food safety education initiatives, such as Project CHILL, complemented by local food safety education programs, may help to increase consumer awareness and knowledge. Project CHILL is a recent campaign launched by the Food Marketing Institute (FMI) and the Partnership for Food Safety to educate consumers about the importance of using a thermometer to monitor refrigerator temperature (8). Also, tools such as a refrigerator magnet that provides the recommended storage time guidelines and safe refrigerator temperature may help to increase consumer knowledge and facilitate adoption of the recommended practices.

The fact sheet motivated some participants to adopt the recommended practices for listeriosis prevention; however, we do not know how long these behaviors will persist. Twelve percent of participants started using a refrigerator thermometer, about 40 percent of participants stored opened packages of vacuum-packed deli meats for the recommended time or less, and about 60 percent stored freshly sliced deli meats for the recommended time or less. More participants followed the recommended storage time guidelines than the recommendation to use a refrigerator thermometer. Although the actual cost to purchase a refrigerator thermometer was not identified as a bar-

rier, the time required to find and purchase one (i.e., search costs) may have been a barrier for some participants.

Some participants did not adopt the recommended practices because they were not very concerned and did not think the risk of illness warranted changes in their behavior. Because prevention of listeriosis may not be a motivating factor in itself, educators may want to consider also highlighting other benefits of the recommended practices, such as improved product quality. For example, these messages could include "using a refrigerator thermometer keeps foods cold so they taste good and are safe" or "storing deli meats for the recommended time provides better tasting and safer deli meats."

Knowing the stage of change for the target population enables educators to tailor the message accordingly (33). Regarding the recommendation to use a refrigerator thermometer, 46 percent of participants were in the contemplative or preparation stage; thus, these participants considered adopting the recommended practice but had not done so yet. Consumers may be more likely to start using a refrigerator thermometer if search costs are reduced. For example, educators could partner with manufacturers and distribute free thermometers at local events such as state fairs or home shows.

Most participants were unaware of the USDA recommendation to reheat deli meats to steaming hot before eating, and many participants did not react favorably to the recommendation. Participants thought the recommendation was inconvenient, did not believe this precaution was necessary, and doubted that many people would follow this recommendation. In focus group research with cancer and organ transplant patients, participants also reacted negatively to the reheating recommendation (17). Together, these studies provide converging evidence which suggests that the "reheat or do not eat" recommendation will have little adherence in these at-risk populations. Future research should address promoting the recommendation among target populations and identifying methods for motivating at-risk individuals to follow the recommendation.

It is important that older adults understand why they are at risk for listeriosis and other foodborne illnesses. Two common themes emerged when discussing whether participants view older adults, including themselves, as having an increased risk for listeriosis and other foodborne illnesses. First, most participants understood that older adults are more susceptible to contracting foodborne illness because of their weakened immune

systems, but they also believed that older adults have safer food handling and consumption practices compared to younger adults, thus reducing older adults' risk of contracting foodborne illness. Research studies have shown that older adults do have safer food handling practices than any other age group (1, 2, 3, 9, 11, 18). In educational materials targeted to older adults, it is important to convey that, although older adults have safer food handling practices, they are still at a greater risk for foodborne illness because of their weakened immune systems.

Second, many participants believed that not all older adults, including themselves, are at risk for foodborne illness. They believed that older adults who have limited education or income, live alone, suffer from other illnesses, and are very old (over 80 years old) are more at risk for foodborne illness. Further research is needed to examine whether there are differences in food safety knowledge, attitudes, and practices among older adults in different subgroups (e.g., education level, socioeconomic group, geographic location, age range, or culture). This information would help target educational initiatives to those subgroups that exhibit limited knowledge and/or risky behaviors.

Finally, older adults reported confidence in their ability to safely handle and prepare food when cooking at home because they have a great deal of experience cooking and most have not contracted foodborne illness. However, the pathogens *L. monocytogenes*, *E. coli* O157:H7, and *Salmonella* Enteritidis were not important causes of foodborne disease when older adults formed their food safety practices. Thus, it is important for older adults to understand that as pathogens evolve, so must people's food safety behaviors.

Although the study provides valuable information for educators, we did not use a random sample of older adults; therefore, the study results should not be generalized to the population of older adults. Also, the research was limited to one geographic location. The focus group methodology employed for this study, however, is appropriate for exploratory research such as this. Additional research is needed with a larger, representative sample to explore whether the educational materials tested in this study are effective at increasing knowledge and use of the recommended practices for listeriosis prevention among older adults.

In conclusion, targeted educational initiatives are needed to educate older

adults about the risks of listeriosis and ways to mitigate these risks. Educators can use the findings from this and other research to develop materials on listeriosis prevention targeted to older adults. Such educational efforts are an important component of the risk management plan for *L. monocytogenes*.

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Identity and Numbers of Bacteria Present on Tabletops and in Dishcloths Used to Wipe Down Tabletops in Public Restaurants and Bars

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SUMMARY

Dishcloths used in restaurants and bars (23 restaurant cloths, 14 bar cloths) were collected, and tabletops (10 restaurants) were swabbed, to determine the occurrence of bacteria. Coliforms were isolated from 89.2% of dishcloths and 70% of tabletops. *Escherichia coli* was isolated from 54.1% of dishcloths and 20% of tabletops. The numbers of heterotrophic plate count bacteria (HPC) and coliforms were significantly higher in bars than in restaurants. The levels of HPC found in dishcloths were 25-fold and coliforms were 60- to 120-fold lower than the levels found in home dishcloths reported in previous studies. The numbers recovered from restaurant tabletops were also lower than those from household kitchen countertops. The most commonly isolated genera from dishcloths in restaurants and bars differed from those in homes. The numbers found for HPC on restaurant tabletops were 45-fold greater after cleaning than prior to cleaning. There were also a 19-fold greater number of coliforms and twice as many *E. coli*. Therefore, although the mandatory use of sanitizers in restaurants and bars may have reduced contamination levels and caused a shift in the microbial populations present in food service establishments, the implication of dishcloths in contamination of tabletops through cleaning suggests that current monitoring of linen sanitation solutions might be inadequate.

INTRODUCTION

In the United States each year, an estimated 76 million cases of foodborne gastroenteritis occur, with 325,000 hospitalizations and 5,194 deaths (10). The microbial causes of foodborne illness include viruses, bacteria and parasites, with symptoms ranging from mild gastroenteritis to life-threatening neurologic, hepatic, and renal disease (10). Because food is transported to consumers through long chains of industrial production, processing and distribution, numerous circumstances allow for contamination along the way, and existing regulations may not be sufficient to prevent illness. It is helpful to understand the mechanisms by which such contamination occurs in order to reduce the risk of foodborne illnesses (16).

Epidemiological surveillance is important in determining the types of foods responsible in outbreaks, the populations at risk, the circumstances that lead to food contamination and the growth/survival of foodborne pathogens (9). Data collected by the US Food and Drug Administration (FDA) from nearly 900 institutional food service establishments, restaurants, and retail food stores identified improper holding times and temperatures, contaminated equipment/cross contamination, inad-

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equate cooking and poor personal hygiene as risk factors for foodborne disease (7). Between 1988 and 1997, restaurants (2,158) were the most significant sources of foodborne outbreaks, followed by residences (1,032) (2, 11).

When contaminated cloths come into contact with fingers or surfaces, microorganisms are readily transferred. This may represent a risk if there is subsequent contact with food (13). Studies in domestic kitchens indicate that wet cloths are important elements in such cross contamination (13). In one study, cleaning cloths impregnated with a quaternary ammonium disinfectant were compared to cleaning cloths used with a detergent (14). Some of the cloths used with detergent became heavily contaminated within three hours of use. Following use of these cloths for surface cleaning, both the surfaces and the cloths were more heavily contaminated, which suggests that cross contamination had occurred between cloths and surfaces. After the quaternary ammonium-impregnated cloths were used for cleaning, a significant reduction in contamination on food preparation surfaces and cloths was found (14).

Enriquez et al. (6) analyzed sponges and dishcloths from household kitchens in the United States. *Pseudomonas* spp. were the most commonly isolated bacteria. Presumptive *Staphylococcus aureus* and *Salmonella* spp. were isolated, with similar frequencies for cellulose sponges and dishcloths. Several other *Enterobacteriaceae* were also isolated. Total and fecal coliform bacteria were present in large numbers in contaminated cleaning materials, sometimes reaching levels greater than 10^8 colony-forming units (CFU)/ml in liquid samples (6). In a similar study of cellulose and natural fiber sponges (loofahs), *S. aureus*, *Aeromonas* spp., *Pseudomonas* spp. *Enterobacteriaceae* and *Serratia* spp. were identified (3). These findings, as well as the recovery of large numbers of enterobacteria from draining boards (15), sinks and dishcloths in household kitchens (12, 15), suggest that dishcloths may act as both reservoirs and disseminators of microbial contamination (15).

In the current study, the occurrence of heterotrophic plate count (HPC) bacteria, total coliforms and *Escherichia coli* on tabletops and dishcloths (used to wipe down tabletops) in public restaurants and bars was determined. In addition, heterotrophic bacterial isolates were identified. The purpose of this study was to determine if current dishcloth sanitation in restaurants and bars is sufficient to prevent environmental cross contamination

and thus the spread of foodborne illnesses in public food service establishments. The microbiological results were also used for comparison with results from previously published household kitchen studies.

METHODS

Sample collection

Cleaning dishcloths (2,025 cm² total area) were collected from restaurants and bars in the United States and placed in Ziploc™ plastic bags for transport on ice to the laboratory. Restaurants in the study included fast food chains; bar and grills; and pizza, Mexican and Chinese restaurants located in New York City (NY), San Francisco (CA), and Phoenix, Flagstaff, and Tucson (AZ). Restaurant tabletops were also sampled by swabbing (approximately 156 cm² total area) with BBL™ CultureSwabs™ (Becton Dickinson, Franklin Lakes, NJ, USA) for subsequent immediate transport on ice to the laboratory. Members of the restaurant staff were unaware of the study and therefore followed their normal cleaning routine.

Sample processing

Dishcloths were wrung to remove any excess liquid; then 75 to 100 ml (depending on the latent moisture content of the cloth) of Lethen neutralizing broth (Difco Laboratories, Detroit, MI, USA) was added to the dishcloths in the Ziploc™ bags. The bags were squeezed to distribute the neutralizer liquid throughout the cloths. After 5 minutes of manual compression, liquid was wrung from the cloths and collected in sterile tubes.

The tabletop culture swabs were vortexed for 30 seconds; then pliers were used to squeeze the liquid from the swab. This resulted in a sample volume of approximately 0.6 ml. An additional 0.5 ml of Tris-Buffered Saline (TBS; Sigma-Aldrich, St. Louis, MO, USA) was added to bring the final sample volume to 1.1 ml. In a separate experiment, tabletops were swabbed, wiped down with a dishcloth (by the restaurant staff) and then swabbed once again to determine if cleaning the table had affected bacterial numbers. As stated previously, members of the restaurant staff were unaware of the study and therefore followed their normal cleaning routine. The swabs were then processed as described previously.

HPC bacterial numbers were determined by plating out appropriate serial dilutions from the swab and dishcloth liquids in duplicate onto R2A medium (Difco, Sparks, MD, USA), utilizing the

spread plate technique. Agar plates were incubated at 30°C for five days; then the bacteria were enumerated by counting colony-forming units (CFU). The number of HPC bacteria per square centimeter was then calculated for each sample.

Total coliforms and *E. coli* were enumerated using Colilert Quanti-Trays™ (IDEXX Laboratories, Inc. Westbrook, ME, USA) as per the manufacturer's instructions.

Species identification

For detection of *Listeria monocytogenes*, 1.0 ml of each dishcloth sample was used to inoculate UVM Modified Listeria Enrichment Broths (Difco Laboratories, Detroit, MI, USA) and incubated for 24 hours at 30°C in a dry heat block. From turbid UVM broth samples, 0.1 ml volumes were transferred to selective enrichment Fraser Broth (Difco Laboratories, Detroit, MI, USA) and incubated at 35°C for 24 to 48 hours. After incubation, 0.1 ml from the esculin-positive samples were placed on the selective chromogenic medium RAPID™ L.mono (BIO-RAD, Hercules, CA, USA), using the spread plate technique, and incubated for an additional 24 to 48 hours at 35°C.

Three disparate colonies from each R2A agar plate were also subcultured on Tryptic Soy Agar (TSA; Difco, Sparks, MD, USA) plates, using the streak for isolation method. The pure cultures were then transferred to MacConkey Agar (Difco, Sparks, MD, USA) plates, Gram-stained and further characterized using the oxidase and catalase tests. Isolated colonies from the TSA plates were also resuspended in inoculating fluid (Biolog, Inc. Hayward, CA, USA) to a turbidity approximately equivalent to Biolog turbidity standards and then used to inoculate Biolog MicroPlates™ (Biolog, Inc., Hayward, CA, USA) as per the manufacturer's instructions. The plates were incubated for 24 hours at 35°C. The results were manually analyzed by use of the Biolog MicroLog 1 System (Program Version 4.20).

Statistical analysis

A Student's t-test was used to compare the bacterial counts recovered from dishcloths in restaurants and bars. Geometric means were used to report the results and were utilized in the statistical analyses. Geometric means were utilized for all bacterial counts because of the presence of outlying data values. Similar studies conducted in household kitchen environments have also employed geometric means (3, 6, 12).

FIGURE 1. Bacterial levels found in dishcloths and on tabletops in restaurants and bars

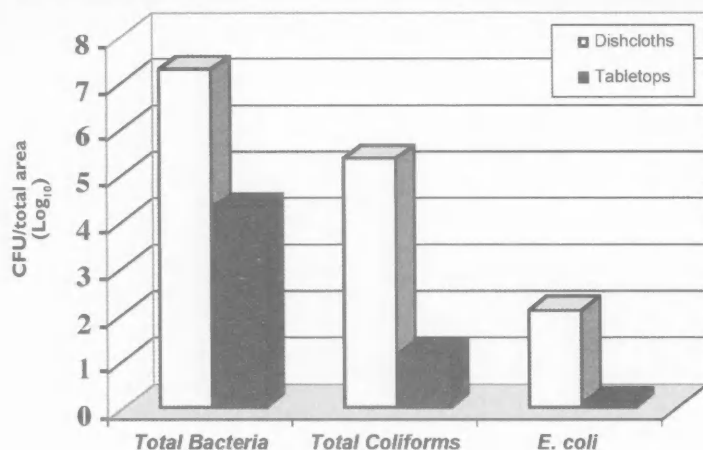


FIGURE 2. Comparison of bacterial levels in dishcloths from restaurants and bars

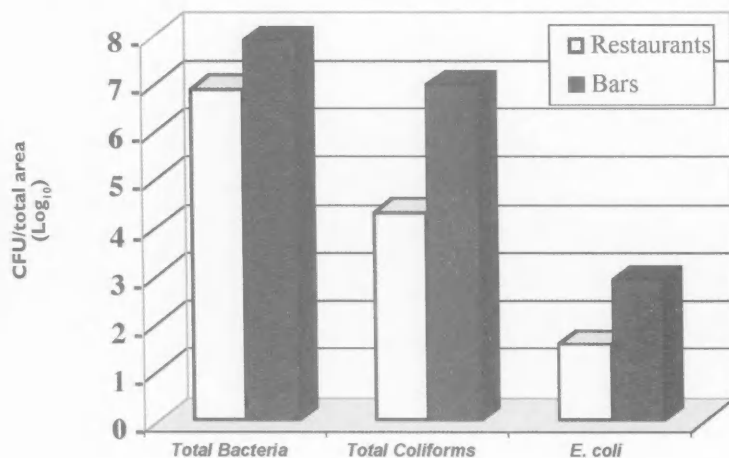
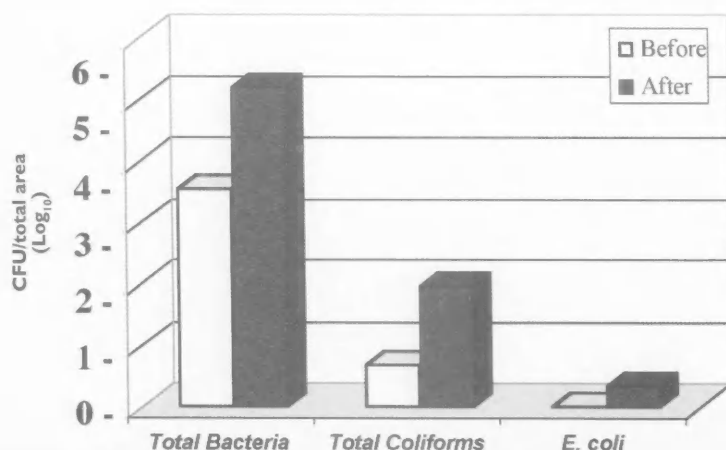


FIGURE 3. Bacteria found on tabletops before and after cleaning in restaurants



RESULTS

HPC, total coliforms and *E. coli* bacteria

Geometric means (GM) of approximately 1.9×10^7 CFU/cloth of heterotrophic plate count bacteria (range of 8.5×10^2 to 8.5×10^{10}), 2.2×10^5 CFU/cloth of total coliform bacteria (range of 70 to 1.0×10^{11}) and 1.2×10^2 CFU/cloth of *E. coli* (range of 2.3 to 1.1×10^6) were isolated from dishcloths in restaurants and bars (Fig. 1). Total coliforms were found in 89.2% of the dishcloths sampled (7.6×10^5 CFU/cloth) and *E. coli* in 54.1% of dishcloths (1.9×10^3 CFU/cloth).

A geometric mean of 2.2×10^4 CFU for heterotrophic plate count bacteria (range of 8.3×10^2 to 2.4×10^7), 15.0 CFU for total coliform bacteria (range of 1.0 to 1.2×10^7) and 1.4 CFU for *E. coli* (range of 1.0 to 27.0) were isolated from swabs of tabletops in restaurants (Fig. 1). These numbers represent the bacteria found on the entire surface swabbed (approximately 156 cm²). Total coliforms were found on 70% of tabletops (49.8 CFU/156 cm²) sampled, and *E. coli* was found on 20% of tabletops (5.2 CFU/156 cm²).

The levels of bacteria found in dishcloths from bars were higher than those found in dishcloths from restaurants (Fig. 2). In dishcloths from restaurants, there were approximately 7.7×10^6 CFU/cloth of HPC bacteria, 2.1×10^5 CFU/cloth of total coliforms and 3.7×10^2 CFU/cloth of *E. coli*. Figures for dishcloths from bars were approximately 8.7×10^7 , 1.0×10^7 and 8.7×10^2 CFU/cloth of total bacteria, total coliforms and *E. coli*, respectively. These differences were significant ($P \leq 0.05$) for HPC bacteria and total coliforms, but not for *E. coli*.

Greater numbers of bacteria were found on tabletops that had been cleaned with a dishcloth than before cleaning (Fig. 3). Approximately 3.56×10^3 CFU/156 cm² heterotrophic plate count bacteria were found before cleaning. This number increased to 1.6×10^5 CFU/156 cm² (45-fold increase) after the tables had been wiped down with a dishcloth. Likewise, the numbers increased for total coliforms (4.9 to 92.2 CFU/156 cm²) and *E. coli* (< 1 to 2.3 CFU/156 cm²) following cleaning.

Bacterial species identification

No isolates of *Listeria monocytogenes* were recovered from dishcloths (0/37) in restaurants and bars; however, *Listeria innocua* was found in 9/37 dishcloths (24.3%). A list of bacterial species recovered from dishcloths is shown in Table 1. The other most commonly isolated spe-

TABLE 1. Bacterial species isolated from dishcloths in restaurants and bars

Species	# Positive	Frequency (%)
<i>Listeria innocua</i>	9/37	24.3
<i>Raoultella (Klebsiella) terrigena</i>	7/37	18.9
<i>Pseudomonas maculicola</i>	6/37	16.2
<i>Pseudomonas putida</i>	6/37	16.2
<i>Pseudomonas fluorescens</i>	3/37	8.1
<i>Ralstonia (Pseudomonas) pickettii</i>	3/37	8.1
<i>Enterobacter cloacae</i>	3/37	8.1
<i>Enterobacter agglomerans</i>	2/37	5.4
<i>Ralstonia (Pseudomonas) solanacearum</i>	2/37	5.4
<i>Cellulomonas hominis</i>	2/37	5.4
<i>Stenotrophomonas maltophilia</i>	2/37	5.4
<i>Acinetobacter calcoaceticus</i>	2/37	5.4
<i>Pseudomonas syringae</i>	1/37	2.7
<i>Klebsiella oxytoca</i>	1/37	2.7
<i>Klebsiella pneumoniae</i>	1/37	2.7
<i>Klebsiella spp.</i>	1/37	2.7
<i>Enterobacter aerogenes</i>	1/37	2.7
<i>Enterobacter asburiae</i>	1/37	2.7
<i>Enterobacter sakazakii</i>	1/37	2.7
<i>Staphylococcus aureus</i>	1/37	2.7
<i>Staphylococcus piscifermentans</i>	1/37	2.7
<i>Staphylococcus sciuri</i>	1/37	2.7
<i>Staphylococcus wameryi</i>	1/37	2.7
<i>Serratia marcescens</i>	1/37	2.7
<i>Serratia rubidaea</i>	1/37	2.7
<i>Kluyvera ascorbata</i>	1/37	2.7
<i>Kluyvera cryocrescens</i>	1/37	2.7
<i>Microbacterium arborescens</i>	1/37	2.7
<i>Microbacterium testaceum</i>	1/37	2.7
<i>Aeromonas veronii</i>	1/37	2.7
<i>Bacillus mycoides</i>	1/37	2.7
<i>Bacillus subtilis</i>	1/37	2.7
<i>Brevundimonas vesicularis</i>	1/37	2.7
<i>Buttauxella izardii</i>	1/37	2.7
<i>Chryseobacterium gleum</i>	1/37	2.7
<i>Comamonas terrigena</i>	1/37	2.7
<i>Corynebacterium thomssenii</i>	1/37	2.7
<i>Dermobacter hominis</i>	1/37	2.7
<i>Escherichia vulneris</i>	1/37	2.7
<i>Herbaspirillum seropedicae</i>	1/37	2.7
<i>Pantoea punctata</i>	1/37	2.7
<i>Paucimonas lemoignei</i>	1/37	2.7
<i>Rhanella aquatilis</i>	1/37	2.7
<i>Roseomonas genomospecies</i>	1/37	2.7

TABLE 2. Frequency (%) of most commonly isolated bacterial species in dishcloths/cleaning utensils

Species	Restaurants and bars ^a	Household Kitchens	
		Study 1 ^b	Study 2 ^c
<i>Pseudomonas</i> spp.	56.8	31.0 – 38.1	31.8
<i>Enterobacter</i> spp.	21.6	14.3 – 20.7	4.8
<i>Klebsiella</i> spp.	27.0	0	0
<i>Listeria</i> spp.	24.3	ND ^d	ND ^d
<i>Salmonella</i> spp.	0	13.8 – 15.4	9.8
<i>Staphylococcus aureus</i>	2.7	18.6 – 20.0	> 60.0
<i>Aeromonas hydrophila</i>	0	0	19.5

a – present study included only dishcloths

b – study included both dishcloths and sponges (Enriquez et al. 1997b)

c – study included both sponges and loofahs (Chaidez and Gerba 2000)

d – presence not determined

TABLE 3. FDA approved chemical dishcloth sanitizers for food service establishments

Sanitizer	Concentration (mg/L)	Time (sec.)	Temperature (°C)	pH	Water Hardness (mg/L)
Iodine	12.5 to 25	30	≥ 24	≤ 5 ^a	N/A
Chlorine ^b	25	7	49	≤ 10	N/A
	50	7	24	≤ 8	N/A
	50	7	38	10	N/A
	100	10	13	≤ 10	N/A
Quaternary Ammonium Compounds	200	30	≥ 24	N/A	≤ 500

a – or a pH no higher than the level for which the manufacturer specifies the solution is effective

b – any of the four sets of conditions specified may be used

N/A – not applicable

cies were *Raoultella* (*Klebsiella*) *terrigena* (18.9% frequency), *Pseudomonas maculicola* (16.2%), *Pseudomonas putida* (16.2%), *Pseudomonas fluorescens* (8.1%), *Ralstonia* (*Pseudomonas*) *pickettii* (8.1%) and *Enterobacter cloacae* (8.1%).

The most common genera isolated (Table 2) were *Pseudomonas* (6 species, 21 isolates, 56.8% frequency), *Klebsiella* (4 species, 10 isolates, 27.0% frequency), *Listeria* (1 species, 9 isolates, 24.3% fre-

quency), *Enterobacter* (5 species, 8 isolates, 21.6% frequency) and *Staphylococcus* (4 species, 4 isolates, 10.8% frequency). *Staphylococcus aureus* was found in 1/37 dishcloths (2.7% frequency).

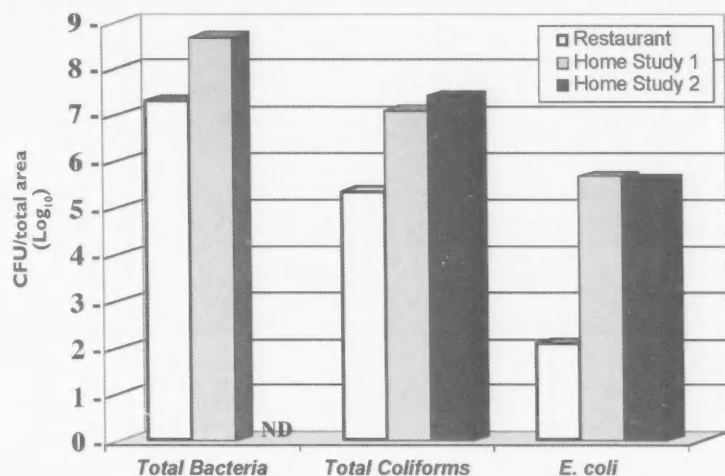
DISCUSSION

Self-disinfecting sponges, which are colonized by lower numbers of bacteria in comparison to regular sponges, reduce

the transfer of total and fecal coliform bacteria to surfaces and to hands (5). Self-disinfecting cloths are often improperly used, causing neutralization of the disinfectant (14). The use of self-disinfecting cloths is therefore not likely to be a viable option for public food service establishments.

The FDA-approved chemical sanitizers for linens in restaurants and bars, and the specific conditions for their use,

FIGURE 4. Comparison of bacterial levels^a in dishcloths from restaurants/bars and homes^b



a – The number of *E. coli* found in restaurants/bars was compared to the number of fecal coliforms in homes

b – Study 1 (Rusin et al. 1998); Study 2 (Enriquez et al. 1997b)

ND – not determined

are listed in Table 3. Other sanitizers are also allowed so long as they are used in accordance with the manufacturer's use directions included in the labeling (1). The purpose of these sanitizer solutions is to sanitize the cloths after they have been contaminated through use. Sanitization is the cumulative effect of treatments that results in at least a 5-log₁₀ (99.999%) reduction in representative disease microorganisms of public health importance (1). The FDA's federal food code recommends that linens used in restaurants and bars to wipe down food service areas be soaked in one of these approved sanitizers under the conditions specified in Table 3 (1). As of September 2004, the federal food code had been adopted by 45 states and one territory and was in the process of being adopted by several others. The FDA's recommendations have therefore been mandated by regulatory agencies in most states (1).

As soiled cloths are added to the sanitizing liquid, organic material in the cloths creates a demand on the sanitizer itself. It may also cause changes in pH and water hardness that will decrease the sanitizer's effectiveness or even neutralize the solution. The sanitizing solution should therefore be checked regularly and replenished/refreshed. The temperature of the sanitizing solution may also drop below the recommended minimum, thereby reducing its efficacy. Food service establish-

ments often do not routinely monitor the quality of the sanitizer dip during use, and restaurants and bars therefore often fail to meet these sanitization criteria.

In the present study, bacterial levels found in dishcloths from bars were consistently higher than dishcloths used in restaurants. One possible explanation is that cloths from bars do not become visibly soiled as quickly as those from restaurants and therefore are not sanitized as frequently. Also, workers in bars are perhaps less aware or concerned about the need for proper sanitation of cloths than are restaurant workers. Cloths in bars are usually used to wipe up liquid spills rather than foods. If they are not sanitized as frequently because of lack of visible soiling and/or worker complacency, this provides a moist environment in which bacteria are able to survive for extended periods (4, 8).

The levels of heterotrophic bacteria, total coliforms and *E. coli* found in dishcloths from restaurants and bars were compared to levels found in dishcloths in homes, as reported in previous studies (Fig. 4). The number of HPC bacteria was approximately 25-fold lower in dishcloths from restaurants and bars than in those from homes (12). Likewise, the number of total coliforms was approximately 60- to 120-fold lower in dishcloths from restaurants/bars (6, 12). The number of *E. coli* was also significantly (3,400-

4,000-fold) lower (in comparison to the number of fecal coliforms) (6, 12). The number of *E. coli* would be expected to be lower than the number of fecal coliforms present; however, the other differences between HPC and coliform bacterial counts could be due to the mandatory use of sanitizers and a greater frequency of cleaning in restaurants and bars. One should note that the Colilert assay used to determine the number of total coliforms in our study also varied from the mEndo plate counts utilized in the household studies (6, 12). Thus, some portion of this discrepancy could be due to the use of different methods.

The total numbers of bacteria, coliforms and *E. coli* (vs. fecal coliforms) found on restaurant tabletops were also lower (2-, 9- and 12-fold, respectively) than those found on household kitchen countertops (12). This was, again, possibly due to the required use of detergents/sanitizers in restaurants. Total bacteria found on tabletops after cleaning was 45-fold greater than before cleaning, perhaps implicating the dishcloths in tabletop contamination. This was most likely due to the inadequate sanitization of the linens used to wipe down tables.

Listeria monocytogenes was not found in any of the dishcloth samples; however, *Listeria innocua* was present in 24.3% of the dishcloths tested. The presence of another *Listeria* species could indicate that conditions may allow for contamination by and persistence of the pathogen *L. monocytogenes*.

Although many of the bacterial isolates identified were similar for both restaurants/bars and homes, *Pseudomonas* spp., and *Klebsiella* spp. were more prevalent in restaurants and bars whereas *Salmonella* spp., *Staphylococcus aureus* and *Aeromonas hydrophila* were more prevalent in homes (Table 2). *Salmonella* spp., which may be isolated from raw chicken and eggs, although commonly found in dishcloths used in household kitchens where raw foods are handled, are not likely to be found in dishcloths used to wipe down tabletops in restaurants and bars, where cooked foods are generally the only foods present. However, the other species differences noted suggest a possible species shift between the microbial populations, because presumably the original microbial populations should be similar in both environments. This is also possibly due to the mandatory and regular use of sanitizers in restaurants and bars.

Although this study was fairly small, it raises several interesting questions. For instance, although the bacterial numbers found in food service establishments were lower than the numbers found in homes,

considerable numbers of coliforms and *E. coli* were still present. This could represent a danger to the public, especially for populations at risk, including the very young, the elderly and the immunocompromised. Also, because the bacterial numbers found on tabletops after wiping with a cloth were higher than the numbers prior to cleaning, the use of such cloths in restaurants and bars could contribute to contamination of surfaces and to the spread of potentially harmful bacteria. Therefore, more careful monitoring of linen sanitization solutions used by food service establishments such as restaurants and bars may be called for.

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Congratulations

At IAFP 2006, we offered a drawing for a one-year Membership with our Association and a free registration to our Annual Meeting. We are pleased to announce the following winners of the drawing:

IAFP Membership

Jack Bozuffi
Bozuffi Consulting Services LLC
Oxford, NJ

IAFP 2007 Annual Meeting Registration

Raylene Keith
Canadian Food Inspection Agency
Calgary, Alberta, Canada



IAFP 2006 Snapshots



A stampede of 1,705 food safety professionals arrived in Calgary, Alberta, Canada for the International Association for Food Protection's 93rd Annual Meeting, August 13–16. The event, held at the Telus Convention Centre, attracted attendees from 35 countries, 47 states, and eight Canadian provinces.

Support from a dynamic group of sponsors helped to fund many of the activities at this year's Annual Meeting, including new events such as the Exhibit Hall lunches. Representatives from over 115 companies exhibited equipment and the latest innovations in food safety services. Without the support of exhibitors and sponsors, many of the meeting activities would be impossible. Please review the list of exhibitors and sponsors on pages 878 and 885, and be sure to thank them for their support of IAFP.



Prior to the Annual Meeting, IAFP hosted three pre-meeting workshops on Friday and Saturday. A two-day workshop, *Global Food Standards: Food Safety Auditing*, outlined the recently launched ISO 22000 Standard and British Retail Consortium (BRC) Global Standard. The workshop covered aspects of both the Standard and auditing techniques to guarantee consistency. The one-day workshop *Methods*,





Methods Everywhere but Which is Right for Me? Selection and Verification of Methods taught participants how to choose analytical tool(s) for microbiological analysis that fulfills the needs of the microbiologist, whether from a large corporate lab or single manufacturing site lab. The second one-day workshop, *Developing and Improving Your Food Microbiology Laboratory* presented practical ways to operate a food microbiology laboratory more effectively and efficiently.

On Saturday evening, attendees were greeted by the IAFP Board at the Welcome Reception. Sunday was a day full of Special Committee, Professional Development Groups (PDGs), and Standing Committee meetings. Minutes from these meetings begin on page 849. If you are interested in being involved in one of the Committees or PDGs, please contact the Association office.

At Sunday's Opening Session, attendees received a warm Canadian welcome from the Alberta Association for Food Protection (AAFP). The Local Arrangements Committee, led by Gary Gensler and Lynn McMullen did an outstanding job throughout the meeting. Thanks to everyone on the AAFP team for all your help and hard work!

Gale Prince, representing the IAFP Foundation, once again challenged attendees to raise money for the Foundation Fund. He pledged to match Beth Johnson's \$1,500 donation, if attendees could do the same. Mr. Prince also donated \$500 to the Fund in memory of Elmer Marth. Attendees more than met the challenge!

For the second time, the Foundation honored students with the Student Travel Scholarship. This year's recipients were Yvonne C. Chan from Cornell University, Luciano Chi Serrano from the University of International Cooperation, Eb Chiarini from the Universidade de São Paulo, and Ashley S. Pedigo from the University of Tennessee.



Dr. John N. Sofos was honored as IAFP Fellow. Fellows are professionals who have contributed to IAFP and its Affiliates with distinction over an extended period of time. Dr. Sofos' biography is highlighted on page 798. Congratulations Dr. Sofos!

Dr. Arthur Liang, Acting Associate Director for Food Safety, National Center for Zoonotic, Vectorborne, and Enteric Diseases, Centers for Disease Control and Prevention, Atlanta, Georgia delivered the prestigious Ivan Parkin Lecture entitled, *A Progress Paradox: If We Have the Safest Food Supply, Why am I Working so Hard?* Attendees ended the evening by enjoying the Cheese and Wine Reception, sponsored by Kraft Foods.



Monday, Tuesday, and Wednesday featured a well-diversified program of over 500 presentations including 26 symposia, 3 round-tables, 80 technical and 350 poster presentations. Thank you to Vickie Lewandowski, Program Committee Chair, and the entire Committee for organizing this year's outstanding program. The session summaries, prepared by student monitors, are available on page 824. A big thanks to Ben Chapman and Laura Bauermeister from the Student PDG for their outstanding efforts in leading the Student PDG this past year.





Strong student participation highlighted many events and activities at IAFP 2006. The Student Luncheon on Sunday was sponsored by Texas A&M Department of Animal Science Food Safety. The luncheon's speaker, Dr. Michael T. Musgrove, spoke to students about navigating graduate degree programs. The students once again hosted the job fair and sold polo and t-shirts outside of the Exhibit Hall. The Tuesday evening Student Mixer was a rousing success.

The Annual Business Meeting highlighted the accomplishments of IAFP over the past year. Jeffrey Farber reported on the achievements of the Association, Standing Committee Chairs reported on their Committee meetings, and Terry Peters gave the Affiliate report. The Florida Association for Food Protection, once again presented the Foundation with \$1,000 in a most unusual way, dressed as Floridian fowl. Minutes from the meeting are on page 847.

This year's Foundation Fundraiser events took participants to Dinner at the Rancho or to the Deane House for a Murder Mystery Dinner. The Silent Auction, which also helped to benefit the IAFP Foundation raised over \$8,300, the complete listing of donations and winners is available on page 876.

In the final presentation at the meeting, The John H. Silliker Lecture entitled, *Rising From the Ocean Bottom – The Evolution of Microbiology in the Food Industry*, featured Dr. William H. Sperber, Senior Corporate Microbiologist, from Cargill, Inc. on Wednesday afternoon. Thank you to Silliker Inc. for making the closing lecture possible. A summary of the lecture is on page 818 of this issue.

The meeting concluded Wednesday evening with the Annual Awards Banquet. IAFP honored excellence in food safety by recognizing 26 individuals and organizations with awards. The award winners are listed on page 797. The evening ended with recognition of Jeffrey Farber's service to IAFP as President. Dr. Farber passed the gavel to Incoming President, Frank Yiannas.

Thank you to all those who participated in IAFP 2006. We are pleased to report that 97% of participants, who were surveyed, felt that the conference met or exceeded their expectations. Please plan on joining us for IAFP 2007, which will be held in Lake Buena Vista, Florida on July 8–11, 2007.



IAFP 2006 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 2006 Black Pearl Award is Ecolab Inc.



Ecolab receives the IAFP 2006 Black Pearl Award.

Black Pearl Award

Ecolab Inc.

St. Paul, Minnesota

Founded in 1923, Ecolab is the global leader in cleaning, sanitation, food safety, and health protection products and services. Ecolab serves customers in the foodservice, food retail, hospitality and food processing industries in nearly 170 countries around the world.

Ecolab provides its customers with world-class service and solutions to help them achieve safer food, hygienic surfaces, and clean, sanitary surroundings. In an era where food safety is increasingly important to customers and consumers, Ecolab's integrated systems approach to food safety and brand protection provides customers with interventions at multiple sites throughout the "farm-to-fork" continuum.

Ecolab associates' expertise in agricultural production, food processing and foodservice, as well as its premium cleaning and sanitation programs,

help reduce the risk of contamination throughout all aspects of customer operations. Ecolab invests heavily in research and development to offer essential solutions – including automated dispensing systems, specialized detergents and EPA-registered sanitizers – that build safety into the food chain and provide reliable and efficient methods for maximizing food safety and quality.

These innovative solutions help solve a broadening array of customer challenges, and help Ecolab advance its central business focus of making the world a cleaner, healthier place to live. Customers who partner with Ecolab experience confidence and peace of mind knowing the health and safety of their customers and employees is more secure, and is in the hands of a trusted team who cares about their well-being.

*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. John N. Sofos received a distinguished plaque in recognition of this prestigious award.



Frank Yiannas (left) presents John Sofos with the IAFP Fellow Award.

John N. Sofos

Fort Collins, Colorado

Dr. Sofos is an international leader in the field of food safety and his consistent and important contributions to his field and to IAFP make him a worthy candidate for such recognition.

Dr. Sofos holds a BS degree in Agriculture from the Aristotle University of Thessaloniki, Greece, and MS and Ph.D. degrees in Animal Science and Food Science, respectively, from the University of Minnesota. Currently he serves as Professor in the Animal Sciences Department at Colorado State University, where he teaches Meat Safety, HACCP and Food Biotechnology.

Dr. Sofos has served on 85 committees (54 chaired) of graduate students from over 20 countries. The research interests of Dr. Sofos address the ecology, detection, stress-resistance and control of bacterial pathogens in foods. He has authored or co-authored over 200 refereed journal papers, 46 book chapters,

six books, 300 abstracts and numerous other publications. Dr. Sofos has presented more than 120 invited lectures, over 60 of which occurred in 18 countries other than the United States. He is a Fellow of the American Academy of Microbiology and the Institute of Food Technologists, and has received numerous awards, including Distinguished Research Awards from the American Meat Science Association and the American Society of Animal Science; the Educator Award from the International Association for Food Protection; and the United States Department of Agriculture Secretary's Honor Award for Superior Service for leading studies on meat decontamination and bacterial pathogen control. Dr. Sofos currently serves on the United States National Advisory Committee on Microbiological Criteria for Foods and has been a Scientific Editor for the *Journal of Food Protection* since 1995.

Honorary Life Award

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.



William H. Brewer (not present)

William H. Brewer

Seattle, Washington

Mr. William H. Brewer was born and raised in Wisconsin. He received his BS in Chemistry from Lewis and Clark College in Portland, Oregon in 1950 and joined Mayflower Farms as a Quality Control Laboratory Technician. In 1953 Mr. Brewer started a 40-year career with Consolidated Dairy Products Co. (Darigold) in Seattle as Quality Control Manager responsible for corporate laboratories. He worked closely with dairy producer organizations to develop and implement the producers' raw milk quality programs as well as procurement and testing procedures. He served as liaison for local, state and federal regulatory agencies. As Corporate Quality Control Manager, Mr. Brewer was responsible for product formulations and product labeling requirements. His last 8 years with Darigold included establishing a research and development department of which he was the director. He retired in 1993 after 43 years in the dairy industry.

Mr. Brewer joined IAFP in 1953 and attended many of the IAFP Annual Meetings. He was a member of the Dairy Quality and Laboratory Methods committees, and has served as Washington State Affiliate Delegate. He assisted with the IAFP Annual Meeting hosted by the Washington Affiliate in 1980 and was Co-chair of the Host Committee in 1996. Mr. Brewer has been a member of the Washington Affiliate (WAFP) since 1953 serving on many committees as well as serving as President. For the past eight years he held the position of Secretary / Treasurer. Mr. Brewer was a member of Oregon Dairy Industries and served on Councils of the National Conference on Interstate Milk Shipments.



Jeffrey Farber (left), presents William LaGrange with the IAFP 2006 Honorary Life Membership Award.

William S. LaGrange

Ames, Iowa

Dr. William S. LaGrange earned his BS from Iowa State University (ISU) in 1953. After serving as an officer in the US Air Force he returned to ISU to earn a Ph.D. in Food Microbiology in 1959. That year he joined the Dairy Science faculty at the University of Kentucky as Extension Dairy Technologist. In 1962 he returned to ISU as Extension Food Scientist and Professor. Dr. LaGrange retired in 2000 from the Department of Food Science and Human Nutrition. At ISU, he was active in various campus organizations including chairman of the ISU Athletic Council and serving on the Faculty Council.

Dr. LaGrange was a visiting Professor in 1975 at the Institute of Food Technology, Campinas, Brazil and in 1986 served as visiting Professor at University College Cork, Ireland. In addition to several state awards for service to Iowa's food industry, he received the 1994 Gamma Sigma Delta University Mission Extension Award, the 1992 IAFP Educator Award, and was named a Fellow by the Institute of Food Technologists in 1992.

The American Dairy Science Association, American Society for Microbiology, IFT, Iowa Association for Food Protection, 3-A Sanitary Symbol Council, and IAFP are the associations in which Dr. LaGrange is active. He was Scientific Editor of *Food Protection Trends* from 1996-2003. He authored several extension publications including three training videotapes and four book chapters.

Dr. LaGrange continues to be active in Rotary, the Ames Foundation, Ames Public Arts Commission, and Ames Trees Forever.

Harry Haverland Citation Award

The 2006 recipient of the Harry Haverland Citation Award, Mr. Gale Prince is being recognized for his years of dedication and devotion to the Association and its ideals and objectives. Mr. Prince has shared his expertise and knowledge in many different forums; he has been a mentor, both formal and informal, to many.



Jeffrey Farber (right), and Joe Jordan, Zep Manufacturing (middle) present Gale Prince with the IAFP 2006 Harry Haverland Citation Award.

Gale Prince

Cincinnati, Ohio

A pioneer in retail food safety with 39 years of experience in the field, Mr. Prince is noted for his contributions in the advancement of food safety in all segments of the food industry. Mr. Prince began his food safety career at the Eisner Food Store division of the Jewel Companies in 1967 before moving on to The Kroger Co. where he has worked the last 27 years and is currently the Corporate Director of Regulatory Affairs. He has been involved in product safety involving all products that are offered for sale from Kroger's 3,200 retail stores and the 42 food manufacturing plants.

Mr. Prince is Past President of the International Association for Food Protection (IAFP) and is currently Chairman of the IAFP Foundation. In 2004 he was named as an IAFP Fellow. He is Past Treasurer of the Association of Food and Drug Officials Endowment Foundation. Mr. Prince serves on the Food Allergen and Anaphylaxis Network Advisory Council and also on the Board of Directors of the Cincinnati Food Allergy Awareness Support and Training. He has served on the Food Marketing Institute Food Protection Committee since it was organized over 25 years ago, has been on the American Bakers Association Food Technical and Regulatory Affairs Committee, and has served on the Board of Directors of the United Fresh Fruit and Vegetable Association. He also serves on the various committees of the International Dairy Foods Association, and has served as Council III Chairman of the National Conference for Interstate Milk Shipments Application of Conference Agreements as well as Council III Chairman of the Conference for Food Protection on Science and Technology. Mr. Prince serves on the Ohio Retail Food Safety Council and served on the United States Department of Justice Drug Enforcement Agency's Suspicious Orders Task Force dealing with controlling methamphetamine. He served on the IFT task group on evaluating the parameters for the definition of potentially hazardous food and on several other task groups on food defense. He was given the FDA CFSAN Director's Special Citation Award in 2004 for his leadership in food safety and food defense regarding the protection of the nation's food supply.

A frequent speaker at meetings of the food industry in North America, Mr. Prince has addressed all of the major food commodities groups. He conducted the first food store manager food safety certification program and was the driving force behind the development of the FightBAC!® program – a joint effort of regulatory and industry working together on providing common food safety messages for consumers.

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Harold Barnum Industry Award

Dr. Paul A. Hall is this year's recipient of the Harold Barnum Industry Award for his dedicated and exceptional service to IAFP, the public, and the food industry.



Frank Yiannas (left), presents Paul Hall with the IAFP 2006 Harold Barnum Industry Award.

Paul A. Hall

Hawthorn Woods, Illinois

Dr. Hall holds the position of Vice President of Global Business Development for Matrix MicroScience, Inc. He recently joined Matrix following a 17-year career with Kraft Foods, where his position was Chief Microbiology and Food Safety Officer for Kraft, Global.

In the position at Kraft, Dr. Hall was responsible for the microbiological safety and stability of some of the most well-known food and beverage brands in North America and the world. Prior to joining Kraft, he worked as a Microbiology Manager in Corporate Research and Development for Anheuser Busch Companies, Inc. and in Central Research for Ralston Purina Company, both in St. Louis, MO.

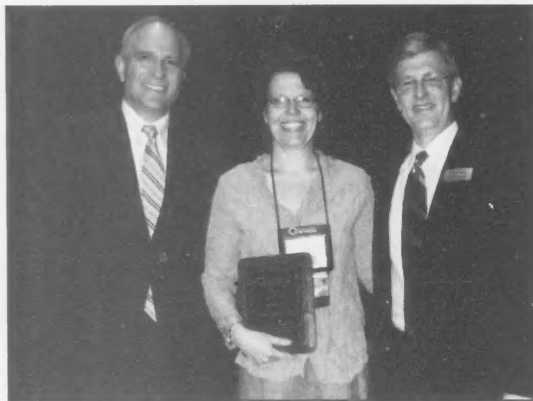
Dr. Hall is Past President of the International Association for Food Protection and has been actively involved with various professional organizations and institutes, including the International Life Sciences Institute, the University of Georgia Center for Food Safety, the American Society for Microbiology, the Institute of Food Technologists, the Food Products Association, and the International Dairy Foods Association, among others. He serves on the editorial boards of the *Journal of Rapid Methods and Automation in Microbiology* and *Food Safety Magazine*. Dr. Hall holds a Bachelor's degree in Microbiology from the University of Missouri-St. Louis, a Master's degree in Technology Management from Washington University, and a Ph.D. in Quality Management from LaSalle University. He has lectured extensively around the world on microbiological food safety, HACCP, rapid testing and detection methods, and microbiological risk management.

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Nasco

Educator Award

The recipient of the 2006 IAFP Educator Award is Dr. Lee-Ann Jaykus. This award recognizes an IAFP Member for dedicated and exceptional contributions to the profession of educator.



Fritz Buss, Nelson-Jameson (left) and Gary Acuff present Lee-Ann Jaykus with the IAFP 2006 Educator Award.

Lee-Ann Jaykus

Raleigh, North Carolina

Dr. Jaykus currently serves as a Professor in the Food Science Department at North Carolina State University (NCSU). She received a Ph.D. (1993) in Environmental Sciences and Engineering from the School of Public Health at the University of North Carolina in Chapel Hill. She previously earned BS and MS degrees in Food Science from Purdue University, and spent seven years serving the industry in various quality control and microbiology positions.

Dr. Jaykus has substantial commitment to the Food Microbiology curriculum at NCSU, having taught undergraduate Food Microbiology since 1995 and various graduate-level food safety courses. In this capacity, she aided in the professional development of over 500 students, who consider her knowledgeable, enthusiastic, and caring. She also generated an exceptional record of research, scholarly work, and grantsmanship, having mentored over 20 graduate students and ten post-doctoral research associates and/or visiting scientists. One measure of her commitment to mentoring is those awards won by graduate students working under her direction, which numbers ten to date. She authored or co-authored over 80 publications, administered more than \$6 million in research funding, and was an invited speaker at numerous conferences and workshops. Dr. Jaykus currently serves on the National Advisory Committee on Microbiological Criteria for Foods.

Over the last ten years, Dr. Jaykus has established a multi-faceted research and education program that is nationally and internationally recognized. In so doing, she has invested time and interest in students and colleagues alike. Believing that our greatest satisfaction comes from our commitment to the development of others, she seeks to demonstrate this commitment in her continued service to the food safety community.

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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. The nomination information for Mr. Jack Guzewich stated that "his dedication as a sanitarian is one that should be followed by others."



Stan Bailey (left) and Katherine Swanson, Ecolab, present Jack Guzewich with the IAFP 2006 Sanitarian Award.

Jack Guzewich

College Park, Maryland

Mr. Guzewich is the Director of Emergency Coordination and Response in the Center for Food Safety and Applied Nutrition of the Food and Drug Administration, where he has worked for the past nine years. In this role Mr. Guzewich is the Center's lead in the investigation of and response to emergencies, including terrorism events involving food and cosmetic products regulated by the FDA. He also is the Center's lead for coordinating investigation and response with other federal, as well as state, and local agencies and for developing recommendations on how outbreaks and emergencies can be prevented in the future.

Mr. Guzewich previously worked for the New York State Department of Health for 27 years where he was the lead for foodborne disease surveillance, food service establishment regulation and training officer for environmental health staff in the state. He holds a Master of Public Health degree from the University of Minnesota. He serves on the editorial board of the *Journal of Environmental Health* and *Emerging Infectious Diseases*. Mr. Guzewich is a past member of the editorial board of the *Journal of Food Protection* and Past President of the International Association for Food Protection where he has been a member for 35 years.

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ECOLAB

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. Dr. Catherine Donnelly is highly regarded as an international expert on the foodborne role of *Listeria monocytogenes*, having published numerous articles and delivered hundreds of presentations on this topic.



Sharon Wilson (left), Weber Scientific, and Gary Acuff present Catherine Donnelly with the IAFP 2006 Maurice Weber Laboratorian Award.

Catherine W. Donnelly

Burlington, Vermont

As Professor of Nutrition and Food Science at the University of Vermont (UV), Dr. Donnelly currently serves as the Associate Director for the Vermont Institute for Artisan Cheese and previously served as the Associate Director for the Northeast Center for Food Entrepreneurship, a research consortium between Cornell University and the University of Vermont. She served as the Associate Dean for Research and the Interim Dean of the College of Agriculture and Life Sciences at UV from 1988–1999.

Dr. Donnelly has been recognized by her colleagues for her many contributions to improving *Listeria* detection. Widely regarded as an international expert on this bacterial pathogen, Dr. Donnelly has published numerous articles and delivered hundreds of presentations on the topic of *Listeria*. She has been a prolific author and a chapter contributor to numerous authoritative texts on *Listeria* detection including *Standard Methods for Examination of Dairy Products*; *Compendium of Methods for Microbiological Examination of Foods*; and *Listeria, Listeriosis and Food Safety*. Her research interests center on development of detection methods for *Listeria* and understanding the impact of sublethal injury on *Listeria* recovery and detection. Dr. Donnelly and her research colleagues pioneered the development of methods to detect *Listeria* in foods, including development of UVM media. Current scholarly interests include investigation of the microbiological safety of raw milk cheeses aged for 60 days.

In 1999, the US Secretaries for Agriculture and Health and Human Services appointed Dr. Donnelly to the National Advisory Committee on the Microbiological Criteria for Foods. Dr. Donnelly was appointed by the FDA Commissioner to serve on the Science Advisory Board of the FDA's National Center for Toxicological Research. In 2000, Dr. Donnelly and her colleagues received, in conjunction with Cornell University, a \$3.8M award from the USDA Fund for Rural America to establish the Northeast Center for Food Entrepreneurship. Dr. Donnelly received the 2001–2002 University Scholar Award from the University of Vermont and was honored as the Division Lecturer for the Food Microbiology Division at the 2002 American Society for Microbiology Meeting. She served as Chair of the Program Committee for IAFP 2005 in Baltimore, MD and serves the AOAC Research Institute as a Performance Tested Methods Reviewer. Most recently, she served on the ILSI Research Foundation/Risk Science Institute Expert Panel on *L. monocytogenes* in Foods, where she chaired the Hazard Characterization Working Group. Dr. Donnelly currently serves as the Scientific Editor of the Food Microbiology and Safety Section of the *Journal of Food Science*.

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WEBER SCIENTIFIC

International Leadership Award

This award is being presented to Dr. Christopher Griffith for his 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. He is an exceptionally dedicated academic who devotes extensive time to food safety and food protection, and provides exceptional leadership in these disciplines.



William Sperber (left) Cargill Inc. and Jeffrey Farber present Christopher Griffith with the IAFP 2006 International Leadership Award.

Christopher Griffith

Cardiff, Wales, United Kingdom

Dr. Griffith earned his BSc and Ph.D. in Microbiology from Liverpool University. This was followed by work in the United States, Sweden and the United Kingdom. He has lectured on aspects of medical and food microbiology for over 20 years and food safety research for 18 years. This includes extensive studies on cross contamination, the knowledge, attitudes and practices of foodhandlers, as well as HACCP.

The recipient of numerous international awards, including a New Zealand ESR international research fellowship in 1999 and a Welsh National Assembly Award in 2002, Dr. Griffith has served as a visiting research fellow and speaker in Europe, South Africa, and the United States. He is a member of a range of national food safety committees and has been involved extensively in food safety training and consultancy.

Dr. Griffith has authored or co-authored more than 350 books, book chapters, scientific papers and conference proceedings relating to food safety, including the "How To" series of books. He is Editor of the *British Food Journal*.

Currently the Head of the Food Research and Consultancy Unit in the Cardiff School of Health Sciences at the University of Wales Institute, Cardiff, Dr. Griffith is involved with food safety at all points within the food chain, including manufacturing, food service and the consumer with over 12 years of research involvement in the latter. He works with a multidisciplinary team including microbiologists, sociologists, psychologists and home economists using traditional and novel approaches in studying food handling, food safety systems and improving the microbiological quality of food.

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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 had a positive impact on food safety, thus, improving public health and the quality of life. Dr. Edward Mather is specifically being recognized for his innovation in creating the curriculum for the Professional Master of Science in Food Safety degree through online study.



Jeffrey Farber (left), Frank Yiannas and Terry Kerby, 3M (right), present Edward Mather with the IAFP 2006 Food Safety Innovation Award.

Edward C. Mather

East Lansing, Michigan

Dr. Mather is the recipient of this year's Food Safety Innovation Award. While he serves as Director of the web-based professional Masters program in Food Safety (ProMS), Dr. Mather is also Deputy Director of the National Food Safety and Toxicology Center at Michigan State University. In addition, he is the Leader for the Education group of the National Center for Food Protection and Defense. His many years as a food animal veterinarian, teacher, researcher and administrator provide a vast array of valuable food safety experience at local, national and international levels. Federal funding provided Dr. Mather an opportunity to generate, through computer technology, new information on animal and zoonotic diseases in food safety. Because of his interest in production agriculture, he has served on numerous national boards and was appointed a Regional Expert for Latin America by the International Atomic Energy Agency, Food and Agricultural Organization.

Dr. Mather was awarded the Stange Memorial Award from Iowa State University, where he earned his DVM degree. He received a Ph.D. in Physiology from the University of Missouri and continued his work as a teacher and research scientist. The College of Veterinary Medicine's Distinguished Honorary Alumnus Award was presented to Dr. Mather at Michigan State University where he has served for the past 28 years.

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3M Microbiology

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.



Gale Prince presents (left to right) Ashley Pedigo, Eb Chiarini, and Yvonne Chan with the Student Travel Scholarship Award. Luciano Chi Serrano was not present.

Yvonne C. Chan

Cornell University
Ithaca, New York

Yvonne C. Chan is a Ph.D. candidate in Food Science at Cornell University, with a concentration in Food Microbiology and minors in Microbiology and Dairy Science. Her research, under the direction of Dr. Martin Wiedmann and Dr. Kathryn Boor, focuses on determining the role of sigma B-dependent and independent mechanisms during cold shock and growth at refrigeration temperature in *Listeria monocytogenes*. She is using molecular techniques such as real-time reverse transcriptase PCR to quantitatively measure gene expression levels of specific transcripts including sigma B-dependent and cold response genes. Ms. Chan hopes this research will allow us to understand how foodborne pathogens like *L. monocytogenes* can grow in refrigerated ready-to-eat (RTE) foods so we can determine how other related gram-positive bacteria like *Bacillus* spp. and psychro-tolerant microorganisms which commonly cause spoilage of food products can grow in refrigerated RTE products.

Before studying at Cornell, Ms. Chan received both a MS in Food Science with a concentration in Food Microbiology and a BS in Microbiology with a minor in Chemistry from the University of Illinois

at Urbana-Champaign. She is the recipient of a USDA National Needs Fellowship, V. Duane Rath Foundation Fellowship, and IFT Graduate Fellowships and worked in the industry as a quality intern at Kraft Foods and at General Mills-Yoplait. After graduation, Ms. Chan plans to pursue a food safety and microbiology career in the industry.

Luciano Chi Serrano

University of International Cooperation
Santa Cruz, Belize

Luciano Chi Serrano is a candidate for a Master's degree in Food Safety (MSc) from the University for International Cooperation in Costa Rica. He is a graduate of the Agronomy Engineer Program, Phytopathology oriented at the Pan-American Agriculture School, Zamorano in Honduras, where he obtained a Bachelor's degree in Agriculture. Mr. Serrano worked with the International Regional Organization for Health in Agriculture (OIRSA) from 2004 to 2006 as the National Coordinator for the IDB/IMF-OIRSA Project in Belize, "Support of Agricultural Trade" through the harmonized application of sanitary and phytosanitary measures in Mesoamerica (ATN/MT- 7957-RG). He also worked with the Ministry of Agriculture and Fisheries as Apiaries Coordinator for the Northern Zone of Belize in 2003.

Mr. Serrano has been the recipient of several other awards. He has received a scholarship from Itchel Tropical Research Foundation to pursue an associate degree in Applied Sciences at the Belize College of Agriculture, Central Farm, (1996–1998); a scholarship from NIPPON Foundation, China, to pursue a Bachelor's degree in Agriculture (Ingeniero Agronomo) at the Pan-American School of Agriculture, Zamorano, Honduras (1999–2002); a scholarship from the International Regional Organization for Health in Agriculture (OIRSA) to pursue a Master's degree in Food Safety at the University for International Cooperation, San Jose, Costa Rica (2005–2007); and was the guest speaker for the graduating class of 2004 from the Belize High School of Agriculture, Orange Walk District, Belize.

Eb Chiarini

Universidade de São Paulo
São Paulo, Brazil

Eb Chiarini, Veterinarian, MSc in Food Technology, worked as a practicing veterinarian in a poultry slaughterhouse in Brazil for over six years. She volunteered herself as a trainer in GMP courses for food service workers promoted by the municipality of São Paulo. Currently, Ms. Chiarini is finishing her Ph.D. at the University of São Paulo (USP), Brazil. The theme of her thesis focuses on the epidemiology of *Listeria monocytogenes* in two Brazilian slaughterhouses which differ only in the evisceration process (manual versus automated). This subject was chosen because the chicken industry is very important in Brazil, ranked first in world exportation and second in the world production of chicken meat. This work will also allow for refinement of HACCP plans, risk assessment and policymaking activities, with the ultimate goal being to provide safer food to local and global customers.

Ms. Chiarini received scholarships from CAPES, governmental Brazilian agency, for developing her MSc and her Ph.D. and a travel grant to participate in the XV International Symposium on Problems of Listeriosis, Sweden from the São Paulo State Foundation (FAPESP). Part of her MSc dissertation was awarded as the second best study presented during USP Symposium. Ms. Chiarini also received a fellowship from Rotary International to participate in a Group Study Exchange in India and a fellowship from CAPES to develop part of the Ph.D. thesis at the Bureau of Microbial Hazards, Health Canada.

Ashley S. Pedigo

University of Tennessee
Knoxville, Tennessee

Ashley Pedigo received a B.S. degree in Agriculture, with a major in Food Science and Technology, from the University of Tennessee (UT). She is currently enrolled in the Masters of Public Health program with a concentration in Community Health Education at UT. Future goals include obtaining a Ph.D. in Food Microbiology and post-doctoral study in Epidemiology. Ms. Pedigo's ultimate aspirations are to integrate laboratory research, epidemiology, and public health education as they apply to food safety in either a government environment, such as the CDC, state health department, or academic environment as a university faculty member.

At this conference, Ms. Pedigo is presenting research that is the culmination of a year-long Undergraduate Honors research project entitled: *Inactivation of Escherichia coli O157:H7 in Apple Juice as Affected by Cranberry Juice Concentration and Storage Temperature*. This research highlights the use of cranberry juice as an alternative to thermal processes in juices to meet juice regulations, while also considering the effects of holding temperatures on the safety of the product, information that is best utilized at the commercial food processing level.

Sponsored by



FPA Food Safety Award

The Microbial Food Safety Research Unit (MFS), ARS/USDA, Eastern Regional Research Center (ERRC), Wyndmoor, Pennsylvania, is recognized both nationally and internationally for the many and valued accomplishments to ensure the safety of our food supply.



John Cherry from the Microbial Food Safety Research Unit (MFS), (ARS/USDA) is presented with the FPA Food Safety Award by Jenny Scott, FPA and Jeffrey Farber. From left, John Luchansky, Jeffrey Farber, Jenny Scott, John Cherry, Robert Buchanan, and Sam Palumbo.

Microbial Food Safety Research Unit (ARS/USDA) Wyndmoor, Pennsylvania

The MFS is comprised of over 40 highly motivated and dedicated employees focused on developing technical information and technologies that meet the needs of federal regulatory agencies, the food industry, consumers, and the international scientific community. Their core strengths include optimization of genomics and proteomics to detect and type pathogens; development of mathematical models to predict the growth, survival, and inactivation of pathogens directly in foods; and validation of interventions to eliminate or control pathogens at various steps along the food chain.

This multidisciplinary team, located at ERRC and at worksites at the University of Maryland Eastern Shore and Delaware State University, has also been highly successful at training early career scientists and students from the US and worldwide who themselves are now becoming recognized for their contributions to the field of food safety. MFS has a solid history of providing timely solutions to food-safety issues and their scientists are continuously working to develop strategies to prevent pathogens from entering the food chain or to cause their destruction if present.

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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.



IAFP Developing Scientist Chairperson, Lee-Ann Jaykus with the Developing Scientist Award Winners (left to right) Jette Emborg, Dennis D'Amico, Andres Rodriquez, Lee-Ann Jaykus, Yuewei Hu, Greg Kepka, and Gianna Duran. The IAFP Foundation sponsors this competition.

ORAL

1st Place – Yuewei Hu

2nd Place – Greg Kepka

3rd Place – Gianna Duran

POSTER

1st Place – Andres Rodriques

2nd Place – Dennis D'Amico

3rd Place – Jette Emborg

Affiliate Awards



Terry Peters, Affiliate Council Chairperson with Affiliate Award Winners (left to right) Lorraine McIntyre, British Columbia Food Protection Association; Natalie Dyenson, Florida Association for Food Protection; Matt Rhodes, Kentucky Association of Milk, Food and Environmental Sanitarians; Janet Harris, Ontario Food Protection Association; and Gala Miller, Missouri Milk, Food and Environmental Health Association.

C. B. SHOGREN MEMORIAL

British Columbia Food Protection Association

BEST AFFILIATE ANNUAL MEETING

Missouri Milk, Food and Environmental Health Association

BEST AFFILIATE EDUCATIONAL CONFERENCE

Florida Association for Food Protection

BEST AFFILIATE COMMUNICATION MATERIALS

Ontario Food Protection Association

AFFILIATE MEMBERSHIP ACHIEVEMENT

Kentucky Association of Milk, Food and Environmental Sanitarians

Ecolab Inc.

IAFP 2006 Black Pearl Winner

St. Paul, Minnesota



EXECUTIVE SUMMARY

Ecolab Inc., based in St. Paul, Minnesota is the world's leading provider of cleaning, food safety and health protection products and services. Ecolab's customers include hotels and restaurants; healthcare and educational facilities; quickservice (fast-food and convenience store) units; grocery stores; dairy plants and farms; and food and beverage processors around the globe. In fact, Ecolab operates directly in 70 countries, employing more than 22,000 associates, and reaches customers in roughly 100 other countries through distributors, licensees and export operations.

Ecolab's unique combination of industry expertise, innovative solutions and the largest and best trained global field service team allows the company to provide our customers with superior results, consistently and reliably across their business. Customers who partner with Ecolab experience confidence and peace of mind knowing the health and safety of their customers and employees is more secure, and is in the hands of a trusted team who cares about their well-being.

Founded in 1923, Ecolab circles its customers with value-added cleaning, sanitation and service solutions through 10 complementary business units. This strategy translates directly into the company's ability to help customers achieve safer food, hygienic surfaces, and clean, sanitary surroundings. For example, Ecolab helps restaurants keep dishes and glasses sparkling, floors slip-resistant and free of grease, provides emergency equipment repair service for fryers, grills and dish-machines, and much more. At bottling plants, Ecolab

provides advanced lubrication to keep the production lines running smoothly, leading-edge programs to clean tanks and fillers, through pest protection to prevent contamination, and operational savings for water usage and cleaning and sanitation. Through the recent addition of its *MarketGuard* program, Ecolab offers food retail customers the benefits of cleaning, sanitation, floor and facility care, and pest elimination needs – a winning combination that utilizes high product and service standards across multiple customer locations.

Simply put, Ecolab provides innovative solutions – like automated dispensing systems, specialized detergents, and EPA-registered sanitizers combined with service excellence – to solve a broadening array of customer challenges around the world. The result is uncompromised cleanliness and operational efficiency for every Ecolab customer.

In an era where food safety is increasingly important, Ecolab's integrated systems approach to food safety and brand protection provides customers with interventions at multiple sites throughout the "farm to fork" continuum. Ecolab associates' expertise in agricultural production, food processing and food-service, as well as our premium cleaning and sanitation products and programs, help reduce the risk of contamination throughout all aspects of our customers' operations. We also offer essential solutions to build safety into the food chain and to provide reliable and efficient methods for maximizing food safety and quality.

For instance, Ecolab Food & Beverage associates focus on preventing contamination at the start of the food chain. Our F&B associates provide customers with premium cleaning and sanitation products, programs and expertise in food production environments. This includes the new Ecolab Livestock Disease Intervention® (LDI) program aimed at helping control cross contamination within animal production facilities, between such facilities, and between production facilities and processing plants. Ecolab also provides complete udder health, hoof management and fly control programs for dairy production facilities all in an effort to help facilitate the production of products safe for human consumption.

Food & Beverage is strengthening its presence in the food processing industry, meanwhile, by changing the way producers approach food safety. Ecolab is re-emphasizing the importance of comprehensive

cleaning and sanitation from the beginning to the end of the process. Multiple interventions are providing an innovative, integrated and efficient approach to helping these customers maximize food safety. Additionally, the introduction of carcass wash products have helped reduce pathogens and other microbial counts on food surfaces in the processing stage. These patented food surface treatments are effective solutions for minimizing microbial contamination during processing and improving the quality and shelf life of food products such as meat, poultry, seafood, fruits and vegetables.

Contamination at any point in a food processing operation can shut down plant operations, costing customers time and money. The Ecolab Pest Elimination Division, therefore, provides custom-designed programs to meet the individual needs of food and beverage processing plants, as well as foodservice and food retail businesses. The emphasis is on sanitation, structural concerns within a facility and preventative exclusion services in every aspect of the food production process.

Once the food supply reaches foodservice vendors, the Institutional and Kay divisions offer a number of high-quality, patented product solutions to help prevent many of the leading causes of foodborne illnesses. These include products to improve employee hygiene practices, sanitize kitchen equipment used to prepare or serve food, as well as high-performance detergents and cleansers for

every surface within a facility. All associates focus on providing customers with *360° of Protection*, surrounding customer operations with a customized program of cleaning and sanitizing solutions to fit their specific needs.

Similar services are provided through our international associates. Many of our global customers increasingly look to Ecolab for consistency and expertise in service, products and programs as they expand their chain businesses. To meet this demand, many of Ecolab's offerings are essentially the same as their US counterparts, though tailored as necessary to meet unique local and regional needs. Most importantly, however, the underlying premise remains the same: to provide the highest quality products and systems, backed by superior service, on a consistent basis to every customer, in every facility.

The last phase of food safety and brand protection deals with a comprehensive intervention program that focuses on compliance. EcoSureSM Advanced QA Services, an Ecolab quality assurance food safety management program, helps customers establish a routine program of self-inspection, provide comprehensive employee training and conducts periodic independent audits to help identify areas in need of improvement. It also brings Ecolab's commitment to its customers full circle.

Ivan Parkin Lecture

“A Progress Paradox: If We Have the Safest Food Supply, Why Am I Working So Hard?”

Presented by Dr. Arthur P. Liang



Dr. Arthur P. Liang delivers the Ivan Parkin Lecture.

The ultimate measure of the safety of the food supply is whether people are getting sick from the things they eat. From this perspective, the US has one of the safest food supplies in the world. Mortality and serious morbidity due to infectious diseases, in general, and foodborne diseases, in particular, have declined dramatically in the last 150 years.

At the turn of the 20th Century, life in general was quite different than it is today. The country was beginning to urbanize and industrialize, but Americans were still a rural people. There was no running water, indoor plumbing, or electricity in homes. America ran on coal. In 1900, 38% of labor force was in farming; by 1990, the proportion had dropped to 3%. During the early 20th century, contaminated food, milk and water caused many foodborne infections. Major killers were typhoid fever, cholera, scarlet fever, and diarrhea. Contaminated people spread diseases such as measles, diphtheria, whooping cough, and rheumatic fever. Tuberculosis, the number one cause of death in 1900, was spread by both food and people. Cities were especially dangerous. Beginning in the mid-1800s through

the mid-1990s, city dwellers paid an “urban penalty” because of increased gastrointestinal and respiratory disease associated with poor sanitation and crowding.

Over the next half century, investments in urban public health, improvements in food technology, rising standard of living, improved nutritional status, and availability of vaccines and antibiotics all contributed to a steady and dramatic decline in mortality from infectious diseases. The “sanitary revolution” began to reduce or eliminate pathogens before they reached consumers. In 1908, Chicago became the first city to mandate pasteurization of milk. Many other cities soon followed. Refrigeration became available for household use in 1913. Public health departments or sanitation boards helped institute sewage and water treatment facilities in the early 1900s in many cities throughout the United States.

A review of public health textbooks from this period identified the following as foodborne diseases: amoebiasis, botulism, brucellosis, cholera, hepatitis, salmonellosis, scarlet fever (*Streptococcus*), septic sore throat (*Streptococci zooepidemicus*), staphylococcal food poisoning, tapeworms, trichinosis, tuberculosis (bovine), and typhoid fever. In the United States today, one’s chance of becoming infected with many of these is literally one in a million. Physicians practicing in the US, today, think of scarlet fever and strep throat as person-to-person, having forgotten that streptococcal disease can be foodborne. Most of today’s physicians have never and will never see a case of amoebiasis, botulism, brucellosis, cholera, trichinosis, or typhoid fever.

So if we have conquered most of the major foodborne disease problems, why are we working so hard? One, perhaps obvious, explanation is that it is because we are working hard that the food supply is safe. As we know, foodborne pathogens have been controlled but not eradicated. Continuing efforts are required to keep diseases under control. 2005 FoodNet data show continued decrease in a number of important causes of foodborne illness. These findings point to the considerable progress that has been made in efforts to make the food supply safer. These decreases in illnesses due to pathogens such as *Listeria* and *Escherichia coli* O157:H7

in the context of new resources and strategies being put in place are consistent with the notion that the safety of the food supply comes with the price of continuing efforts on the part of the food safety community.

Another common explanation for why we are still working hard is that increased investments in the public health infrastructure has led to detection of more and different kinds of foodborne illnesses and outbreaks which likely went unnoticed in previous years. Advancements in molecular "fingerprinting" of pathogens have led to an improvement in recognition and reporting of outbreaks. As a result, previously "invisible" outbreaks have become visible. This is illustrated nicely in tracking outbreaks of *Listeria* and *Escherichia coli* O157:H7. Between 1989 and 1997, there were exactly two *Listeria* outbreaks reported to CDC. In 1998, PulseNet began regular subtyping of *Listeria* by Pulsed Field Gel Electrophoresis (PFGE). Between 1998 and 2003, a total of twelve outbreaks including five multi-state outbreaks, were detected. This occurred even as rates of individually reported cases continued to drop. Similarly with *Escherichia coli* O157:H7, the number of outbreaks had peaked in 1995 and appeared to be declining through 1997. Then in 1998, PulseNet "turned on" PFGE for *Escherichia coli* O157:H7, and the number of outbreaks jumped to new highs. Though perhaps less dramatic than laboratory advancements, there is also evidence that, at least in some states, increased hiring of epidemiologists and other public health professionals has led to an increased capacity to detect and investigate foodborne outbreaks.

Perhaps we are working harder despite having the safest food supply because the problems that remain are harder to solve. That is, we have solved all the "easy" problems leaving only the toughest and most labor-intensive ones to challenge us. From a microbiologic perspective, new problems keep emerging because of a constant evolutionary "arms race" between us and the germs. *Norovirus* is a good example. These viruses are infectious at very low dose, can be shed by individuals showing no symptoms, can be transmitted person-to-person as well as through food and water, induce no lasting immunity, and are relatively chlorine-resistant. Moreover, our ability to study the virus to fine-tune control strategies is hampered by our inability to grow the virus in the laboratory.

Many of today's food safety problems are also more challenging from a consumer perspective. It is one kind of challenge to be asked to protect the average healthy American from foodborne illness; it is quite another to be asked to protect the highest risk individuals. These individuals often turn out to be those with some deficit

in their immune systems. In the very young, immune systems are still immature. Newborns have few defenses against bacterial infections. In addition to their limited production of antibodies, newborns possess only 20 – 30 percent of the quantity of stored bacteria-fighting white blood cells compared to adults. The limited immunity that they acquire from their mothers starts to wear off before their own systems are fully functional. Children continue to be at relatively high risk from infections from age three months to three years. Only by the time they are ten or twelve are they no longer more vulnerable than adults.

Senior citizens are more vulnerable to bacterial infections because of an aging immune system. Even the immune system of a healthy older person is generally somewhat less robust than that of a younger adult. Specific immune responses such as recognition of foreign antigens (microorganisms, parasites, proteins) and subsequent production of specific immune cells, antibodies, and inflammatory chemicals become less effective with age. An example is alterations in different types of white blood cells. With age, however, the body's production of T-cells capable of responding to new infectious challenges declines, as does the B-cells' ability to produce specific antibodies. As a result, seniors are less capable of mounting a vigorous immune response to bacteria to which they have not been previously exposed.

According to Mead et. al's estimated 5,000 deaths per year due to foodborne illness, the top three causes of death are *Salmonella*, *Listeria* and *Toxoplasma*. Looking at *Salmonella* deaths by age, those over 60 accounted for the largest group; all the deaths in younger adults were in patients who had other serious chronic diseases such as HIV, cancer, or cirrhosis. In the US, toxoplasmosis deaths are primarily in persons with AIDS, and listeriosis is primarily a disease of those under one year of age or over 60.

Perhaps, we are still working hard because there is still so much to do. After all, there are 76 million cases per year as estimated by the CDC. However, upon closer examination, it seems that there must be more to the story. Some of the top causes of foodborne illness such as *Norovirus* and *Campylobacter* are not always the diseases that receive the most attention, while some that are relatively rare like *Listeria* seem to demand quite a bit of attention. To test this hypothesis, I did a "quick and dirty" analysis. Using the CDC intranet, I did a document search by pathogen. If the number of CDC documents is a good index of workload, it suggested that workload, indeed, did not neatly correlate with the size of the problem. *Listeria*, *Vibrio*, *Escherichia coli* O157, and "mad cow" disease appeared to be responsible for a disproportionate amount of work.

Why should this be? I believe at least part of the reason for this is that these diseases represent a particularly difficult type of problem, the low-probability/high-consequence problem. It doesn't happen often, but when it does, the consequences can be very, very bad. People and businesses can die. In the words of the risk communication guru Peter Sandman, these are high "dread" events. Risks are relatively low, but are they low enough? Should more be done? What are the costs? What are the opportunity costs of investing more effort in controlling this pathogen versus that one? These problems are also difficult because they are as much human response problems as pathogen control problems. The human response, however, is not trivial; the response is one many of us would share. As individuals, we ourselves are often conflicted. The food scientist in us understands the actual risk is low, but the consumer in us wants to apply the "precautionary principle" in the face of potentially catastrophic consequences. Even though it does not involve food, the decision analysis for HIV post-exposure treatment after needlestick is illustrative. The risk assessment model suggests that one should not take post-exposure treatment after accidentally jabbing oneself with a needle used to draw blood from an HIV+

patient. However, in my experience the vast majority of individuals faced with this decision will choose to take the treatment even if it is costly and has side effects. And, indeed, CDC eventually made an official recommendation in support of treatment in such situations. In food safety, I believe we have seen an example of this among individuals who consumed milk from a dairy cow with rabies (Oklahoma, 2005). I believe we are also seeing this play out in certain zero-tolerance food safety policies and concerns about *Enterobacter sakazakii*. There is a desire to "overreact" in the best sense of the term in these situations. We want to do all we can afford to do to avoid a potential catastrophe.

So, despite having the safest food supply, I believe food safety work will continue to be challenging work. We will continue to work hard in order to maintain the gains that we have made. Health departments will create more work by detecting more outbreaks. More challenging pathogens will continue to emerge. Finally, we will be working harder because we will demand it of ourselves, or society will demand it of us.

Opinions contained in this paper are those of the author and do not necessarily reflect the policies of the US Centers for Disease Control and Prevention.

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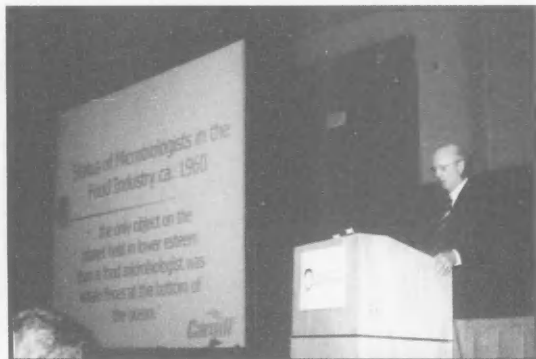
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The John H. Silliker Lecture

Rising From the Ocean Bottom— The Evolution of Microbiology in the Food Industry

Presented by William H. Sperber



William H. Sperber delivers the John H. Silliker Lecture.

Good afternoon. It's nice to see such a large crowd. The bigger, the better, because I want to explain, in part, how we can continue to work together to improve our profession. I want to thank IAFP and the Silliker lecture committee for this invitation. It is a distinct honor to present the John H. Silliker Lecture. Dr. Silliker's long and productive career is one of the reasons that the stature of microbiology in the food industry has evolved from the ocean bottom to its present position. I will explain the "ocean bottom" metaphor shortly. I was asked to talk about the changes in food microbiology that have occurred during my career. This lecture reflects my experiences and opinions. Many of you have shared a large part of this journey with me. If you have different ideas and opinions than mine, I would like to learn about them. Feel free to contact me.

Microbiology did not emerge as a scientific discipline until the mid-19th century, when Louis Pasteur and other European scientists began to study and explain the germ theory of disease. One of the other scientists was Marcel Mérieux, a Ph.D. chemist like Pasteur. Together they developed the first rabies vaccine. Mérieux founded the Institute Mérieux in 1897, which led in 1974 to the company bioMérieux, a name very well known to us. It should be humbling for us to consider that these chemists trained the first generation of microbiologists, most of who were clinical microbiologists. When food microbiology emerged as its own discipline in the early 20th century, its diagnostic tools were largely based on the

methods of clinical microbiology. Often these methods were not very well suited for the examination of foods. For example, clinical specimens usually contain pathogens in very high numbers, and in relatively pure culture. Clinical isolates can often be obtained simply by swabbing a blood agar plate. Contrast that to examination of food samples in which pathogens, when present, are present in low numbers, and they are usually highly outnumbered by the remainder of the food microflora. Compared to swabbing a blood agar plate, it's hard work to find a pathogen in a food sample. More recently, food microbiology became established as an independent discipline with its own methodologies, and in the food industry, with its own distinctive set of food safety management procedures.

It is my observation that many of the most influential food microbiologists over the past sixty years or so are those who had experience in clinical microbiology or began their careers in medicine. Chief among these are Dr. Silliker and one of his early colleagues, Dr. Robert Deibel. Two persons who held M.D. degrees contributed mightily to food microbiology during their careers. These are Dr. Gail Dack, who founded the Food Research Institute at the University of Chicago in 1946, and Dr. David Mossel, who may have been our first influential global food microbiologist. Of course, other food microbiologists may share this clinical background, but these are four that I have known.

I first met Dr. Silliker in the 1960s when I was Dr. Deibel's graduate student in Madison. I remember when John visited our lab. He and Bob reminisced about their careers and about the state of microbiology in the food industry. The American food industry had become quickly modernized after World War II. The development of reliable mechanical refrigeration and transportation systems permitted the centralized production and wide distribution of most foods. Different forms of ingredients were developed for use in new kinds of shelf-stable foods. For example, dried eggs replaced shell eggs. Dried milk replaced fluid milk. These different forms of ingredients brought with them an unexpected, but widespread problem for the food industry—*Salmonella* contamination—and a lot of product recalls and adverse publicity.

Food industry leaders were, of course, quite upset about the epidemic of *Salmonella* recalls in the 1960s and the intense regulatory attention that was directed at them, the food processors. And who got blamed for this *Salmonella* situation? The microbiologist! Of course! John Silliker once told us that in the eyes of those early food industry executives, "The only object on the planet held in lower esteem than a food microbiologist was whale feces at the bottom of the ocean!" Do you think that some of this sentiment lingers today? How many of you have investigated a *Salmonella* problem only to be told by the plant manager, "We didn't have this kind of problem until you showed up!" "Whale feces at the bottom of the ocean..." I think that sentiment has subconsciously motivated me over the years to help improve the "esteem rating" of food microbiologists.

We needed a metamorphosis to an image more positive than whale feces. In my first jobs at Best Foods and Pillsbury I began pointing out to frustrated plant managers and industry executives that we microbiologists were often helping their businesses by solving problems, preventing problems, and making direct value-added contributions, including product and process innovations. I began to refer to myself and my staff as "The Friendly Microbiologists." During my career I've mentored and worked with dozens of Friendly Microbiologists. Some of them are here today. Of course, many of you and hundreds of others not here today have become part of this wave of Friendly Microbiologists.

How exactly did microbiology in the food industry rise from the ocean bottom and evolve to its current status? In the past forty years several significant driving forces have improved our professional status. The four driving forces that I think are important are: pathogen evolution and globalization, the implementation of new food safety management systems, technological advances in our laboratories, and increased scientific professionalism for food microbiologists.

Pathogen evolution and globalization

Well into the 1950s, the number of recognized foodborne pathogens could be counted on one hand. *Clostridium botulinum* in 1896 was the first pathogen shown to be the cause of "food poisoning." *Salmonella* was added about 20 years later. The third pathogen was added to the list in 1933 when Dr. Gail Dack drank a pure culture of *Staphylococcus aureus*, became violently ill and, fortunately, lived to tell about it. Later Dr. Bergdoll and his team at the Food Research Institute identified and characterized numerous staphylococcal enterotoxins. Sometime in the 1940s European microbiologists added *C. perfringens* to this list, but it took another 15 years for us North Americans to believe them.

We have a much longer list of foodborne pathogens today. Here is a list of 21 pathogens, some of which we could not have imagined 40 years ago. This list includes a great many additional bacterial pathogens as well as protozoans, viruses and even prions. I labeled this slide

as the year 2000, to go along with the previous slide for 1960. Maybe we could create a new list every 40 years. How will the list for 2040 look? Has the number of foodborne pathogens peaked, or can we expect more?

According to Mark Woolhouse and his fellow epidemiologists in Scotland, we can likely expect many more. They have tabulated 1,407 species of human pathogens, of which 816 are zoonotic, infecting humans and other species of animals. Of these, 177 are currently emerging or reemerging viruses or bacteria. Just how many of these 177 emerging pathogens might soon become new foodborne pathogens cannot be predicted today, but it is safe to say that the 2040 list will be much longer than today's list of 21. This sure looks like job security! Encourage your children to go into microbiology or public health!

The criticality of this situation with emerging pathogens has been accelerated by increased global travel and by a very large global trade of food ingredients and products. The importance of food microbiologists has certainly been elevated by the necessity of confronting these pathogens in the food industry over the past 40 years. The need for our increased involvement to confront even more foodborne pathogens is obvious.

Food safety management systems

It might seem odd to introduce the topic of food safety management systems into this discussion. However, of the driving forces that have enhanced the reputations and the necessity of food microbiologists, I think that this one will prove to be the most important.

In the 1950s and 1960s, quality control systems were developed in an attempt to assure food safety and quality for the modernized food industry. Under quality control systems, products were produced, warehoused, sampled, tested, and finally released, but only after laboratory clearance, often many days later. Food microbiologists were the slaves of microbiological specifications, sampling plans, lot acceptance criteria, and product testing procedures. Among their many deficiencies, quality control systems had a fatal flaw—they could not reliably detect low incidence defects.

For example, if you wanted to detect a defect such as *Salmonella* contamination that occurred at a 0.1% incidence (a level typical in those few lots of food that have been found to be contaminated with salmonellae), you would need to test 3,000 samples in order to detect one positive sample at the 95% confidence level. We can agree that such a sampling plan is impractical. Is it any wonder that industry executives had a dim view of food microbiologists back in the 1960s? Product testing does not work to assure food safety.

Therefore, the HACCP system of food safety was pioneered in the 1960s and applied in the food industry beginning in 1971. It was initiated by the food industry's leading microbiologist of that time, Dr. Howard Bauman with the Pillsbury Company. The HACCP system controls significant hazards by designing food safety into the

product and the process by which it is produced. I am severely limited by time today, but you all understand HACCP and I don't need to convince you about its effectiveness. It has been accepted globally by the food industry, and more importantly by regulatory bodies and the Codex Alimentarius Commission. In 1992 the Codex Committee on Food Hygiene wrote the globally definitive paper on HACCP principles and guidelines for implementation. HACCP is used globally today because Codex positions have the effect of law between trading partners who are members of the World Trade Organization. What a remarkable success! Where else is there an example of one procedure being applied uniformly in almost every country of the world? Microbiologists in the food industry deserve a lot of credit for this remarkable success story!

The proven effectiveness of the HACCP system has reduced, if not eliminated, the need for microbiological specifications and lot acceptance criteria that were used in quality control programs to provide food safety and quality assurance. Don't misunderstand me. I'm not against microbiological testing. However, I think that we need to better focus our microbiological resources on more essential activities such as designing food safety into the product and the process by which it is produced, validating critical limits and critical control points, and verifying compliance with the requirements of the HACCP system and its prerequisite programs. For example, we have often come up short in matters related to sanitary design and better cleaning and sanitation procedures, in part because our microbiological resources were focused on unnecessary product or ingredient testing.

In Cargill's dry milling businesses we have established microbiological monitoring guidelines to replace many of the microbiological specifications and lot acceptance criteria at minimal cost. We are promoting this idea with our customers and within the industry. In a nutshell, monitoring samples are taken periodically in the dry milling environment for performance of indicator tests such as aerobic plate and mold counts. Results that are too high trigger resampling, investigations, and corrective actions as necessary. The North American Millers' Association is preparing a complete report on the microflora of milled cereal grains and on this change to use microbiological monitoring guidelines for food safety and quality assurance in commercial transactions. It will soon be submitted to the *Journal of Food Protection* for publication. Keep your eyes open for that. The reasonable application of microbiological testing requirements may be the next significant advance in food safety assurance and management. I will do everything I can to advance this approach beyond the dry milling industry and I look forward to your help.

TECHNOLOGICAL ADVANCES

We have lived through two amazing technological revolutions that continue to change our world. These are the biotechnology and the computer and information

technology revolutions. These have had a major impact on most aspects of our lives, including the way we go about our business as microbiologists.

In the good old days, only relatively large outbreaks of foodborne illness could be detected by conventional epidemiological procedures. It was very difficult to link cases of human illnesses to the foods that were responsible. Investigations often took weeks or months. In contrast, today, even small outbreaks of foodborne illness can be detected and quickly traced to the responsible food because of our ability to "fingerprint" pathogens by pulsed-field gel electrophoreses (PFGE). Moreover, the PFGE patterns can be shared electronically between public health agencies around the world. Today, there's no place to hide if your contaminated product has caused an illness outbreak. PFGE has reinforced the need to implement preventive control measures that are typical of a HACCP system. Food microbiologists typically develop these control measures.

Another important advance involves our laboratory methods, which have become more rapid and accurate. For example, early methods that we adopted from clinical microbiology for the isolation and identification of *Salmonella* and *E. coli* required as long as 5 to 9 days for completion. Even after this much elapsed time there often remained uncertainty about the precise identity of the isolated microbe. How many of you suffered through the tedious MPN procedures for the detection of coliform bacteria and *E. coli*? The manual 3-tube MPN procedures should have been banished decades ago! Today's well-established methods such as PCR for *Salmonella* detection and Petrifilm for *E. coli* quantitation are so quick and accurate that they can be used almost in real time to support HACCP and Just-In-Time production programs. These are very significant developments that further enhance the reputations and the effectiveness of food microbiologists.

Of course, technology advances rapidly and we can expect even better methods. At this meeting I was introduced to two new technologies that may be useful in the near future. One is based on Raman spectroscopy for the more rapid and accurate identification of pathogens. The other features an automated 16-tube MPN procedure that could be used instead of quantitative plating procedures.

Increased scientific professionalism

By your attendance at this meeting, you are well aware of this fourth driving force to get us off the ocean bottom.

Numerous professional associations such as the International Association for Food Protection, the Institute of Food Technologists, the American Society for Microbiology, the Association of Official Analytical Chemists, the American Association for Cereal Chemistry, and the Food Microbiology Research Conference have served to educate food safety and microbiology professionals. During my career the center of gravity for excel-

lence in food safety and food microbiology has shifted from ASM in the 1960s, to IFT in the 1980s, and now to IAFP. While all three associations have excellent food microbiology divisions, IAFP is clearly the center of gravity. IAFP is likely to retain this position because it is the only association focused solely on food safety, and it has outstanding professional and volunteer leadership.

Trade associations such as the Food Products Association, the North American Miller's Association, the International Society for Beverage Technology, the American Meat Institute, the National Turkey Federation, and the International Life Sciences Institute have enabled microbiologists to think and work together to solve and prevent microbiological problems across the food industry, not just within individual companies. Of course, there are many more professional and trade associations than those listed here. These are some that I've worked with during my career.

Additionally we enjoy many formal and informal associations with academic institutions. The Food Research Institute at the University of Wisconsin, the Center for Food Safety at the University of Georgia, and the Food Allergy Research and Resource Program share a common heritage. They have served as models for numerous "Centers for Food Safety" that have been established at many additional universities in the past ten years or so. The academic connections help the food industry by conducting basic research that the industry is loath to perform, and by serving as a neutral ground between the food industry and the regulatory agencies in times of crisis.

Even our relationships with the regulatory agencies have steadily improved over the past decades. Sometimes we in the industry can even have a useful impact on the development of food regulations, through our interactions with the National Advisory Committee on Microbiological Criteria for Foods, the Codex Committee on Food Hygiene, the Center for Food Safety and Applied Nutrition (FDA) and the Food Safety and Inspection Service (USDA). In his speech earlier today, Dr. Buchanan of FDA appealed to you to be more forthcoming in providing industry data to support new regulations. Take him up on his request. The food industry is the principal repository of food safety information and knowledge and we should not unduly guard our data.

Two additional developments in the past 40 years have also enhanced the professional capabilities of microbiologists and food safety personnel in the food industry. These are the emergence of consulting groups and technology vendors. A partial list of consulting groups and laboratories that are IAFP sustaining members includes Silliker, Inc., Deibel Laboratories, Inc., ABC Research Corporation, The National Food Laboratory, Inc., Q Laboratories, Inc., Randolph Associates, and Seiberling Associates. The technology vendors that are IAFP Gold Sustaining Members are bioMérieux, Inc., BPI Technology, Inc., DuPont Qualicon, Ecolab Inc., and

Microbial-Vac Systems, Inc. Many other technology vendors are Silver and Regular IAFP sustaining members.

All of the above interactions and connections have improved our professionalism and have enhanced our contributions as food microbiologists.

CONCLUSION

What is the status of microbiologists in the food industry today? If we consider the geological spectrum from the ocean bottom to the mountaintop, I would say that our profession is certainly on solid ground. We are no longer "whale feces" at the bottom of the ocean. The reputations of food microbiologists have been enhanced to the point that within the industry, the terms "food microbiology" and "food safety" are essentially synonymous. This important development is the reason I think that the new food safety management systems are the driving force most responsible for our improved performance and reputations as food microbiologists. Unlike the situation several decades ago, microbiologists usually lead food safety functions in food companies today. I've always maintained that if you needed help to solve a technical problem in the food industry, you should seek the help of a food microbiologist. Food microbiologists are well experienced in the company's operations, from ingredient procurement to product and process development, HACCP and prerequisite program implementation in the production plants, distribution to foodservice and retail customers, and consumer, public relations, and regulatory issues. No other professional discipline is so broadly competent in the operational functions of a food company. This fact may be the best measure of our success.

Yet, not everything is as good as it could be, and that is disappointing. We are not close to the mountaintop. I know that sometimes microbiologists are still marginalized in food companies, particularly where it matters most, in plant operations, the very place where food safety must be controlled. Those of you involved with plant operations, or even R & D programs, should examine your functions to be sure that the microbiologists and other food safety professionals are used wisely and are not burdened with unproductive work. Most important, they must never be ignored or silenced when difficult corrective or enforcement actions must be taken. Sadly, such repression occasionally happens, even today. Despite our remarkable advances and long efforts at executive education, ignorant and stubborn food industry executives are not yet an extinct species, resting on the bottom of the ocean.

Therefore, we still have work to do to further improve our profession. We cannot rest on the achievements of those who preceded us and on our recent accomplishments. Although we are in a very good and improved position today, we need to promote the successes of the past forty years and build upon them. We all must strive to be "Friendly Microbiologists" and "Ambassadors for Food Safety." So, let's go home and do it!

Our Experiences by the IAFP 2006 Student Travel Scholarship Award Recipients

Sponsored by



Yvonne C. Chan
Cornell University
Ithaca, New York



My first IAFP conference was a memorable experience. At the conference, I saw presentations by experts in the field of food safety and quality. I found the current research was extremely interesting and this included information about microbial concerns

regarding refrigerated RTE foods, foodborne viruses, and microorganisms in dairy products. Posters by researchers around the world were well presented. Exhibitors were all very friendly to students and I learned a lot about cutting-edge technologies including ones currently used and those that will be used in the near future. From the presentations, posters, and exhibits, I found that food safety and quality research is currently being done on a diverse set of microorganisms and in a wide array of food matrices. Even though there were many different types of research going on, it was nice to know that the overall goal was to improve food safety and quality worldwide.

At the student luncheon and mixer, I talked to food safety professionals and peers. The presentation by Mike Musgrove of the USDA was excellent since he gave great advice to students. I reconnected with people who I haven't seen in some time and was also introduced to other students who attended the conference. The student mixer was a fun, relaxed social environment, where I interacted with peers from various universities. Also, I appreciated that scientists from food companies took the time to go to the mixer to talk to students.

During my stay in Canada, I had some time to explore Calgary. I found the city was diverse and the people were friendly. Chinatown was only a few blocks away from the Telus Convention Center and when I went there it reminded me of Chinatown in my hometown of Chicago. While there, I had delicious dim sum with lab mates, former lab mates, and my advisor.

It was a truly rewarding experience that has enhanced my development as a young scientist. I thank the IAFP Foundation and IAFP members for their continued support of this student travel scholarship. I encourage eligible student members of IAFP to apply for the IAFP student travel scholarship and to attend the next IAFP conference in Orlando, Florida, so you can have a wonderful experience as I have had at this conference.

Eb Chiarini
Universidade de São Paulo
São Paulo, Brazil



My participation at the 93rd Annual Meeting was very important and profitable. I met renowned people in the food protection area, learned and got state-of-the-art information. I had an opportunity to exchange professional experiences with reputable

researchers. IAFP also presented a great opportunity to meet people from all over the world by providing a forum for technical information and personal experiences exchange. These experiences will be very useful in my future career. I had the opportunity to present two posters that highlighted some of my research achievements and showed the international attendees a view of the poultry industry in Brazil.

I am grateful to IAFP for this award, not only for the opportunity to attend this event, but for the impact that it has made in my professional life.

Ashley S. Pedigo
University of Tennessee
Knoxville, Tennessee



Iwould like to extend my deepest gratitude to IAFP for providing me with the tremendous opportunity of attending the 2006 conference in Calgary through the student travel scholarship. The conference was a major success for me both professionally and personally.

The receptions and exhibits on the expo floor allowed me to make strong contacts with food safety professionals with whom I share research and career interests. To a student, these contacts are priceless when seeking to expand knowledge, continuing education, or beginning a career.

I greatly enjoyed my poster session, with the moment prevailing most in my mind was when a very well known and respected IAFP member told me that "in good research, you sometimes end up with more questions than you start with." After much discussion and excellent feedback from both students and professionals, I found myself in this exact situation – with more questions! I was amazed by the sheer volume of variety and the depth of intellectual material presented by other students in the poster sessions.

There were also many outstanding symposia and presentations that offered opportunities to extend my knowledge in many areas of food protection. Witnessing new ideas and innovations and receiving the most current information in the field at conferences like IAFP keeps us all on our toes, striving to further enhance food safety for our global community.

I was fortunate enough to travel to Banff and Lake Louise (known to some as Lucille J) to enjoy the beauty of the Canadian Rockies. The entire trip was truly a remarkable experience for me.

Session Summaries

Members of the IAFP Student Professional Development Group assisted the Convenors by serving as Session Monitors at IAFP 2006. Student Monitors prepared the following session summaries for presentation in *Food Protection Trends*.

S01 – Making Foods Safer: How Outbreaks Can Influence Change

Armitra Jackson, Iowa State University,
and Angela Laury, Texas Tech

Jack Guzewich, of FDA-CFSAN, began the session with a presentation on the topic "Lessons Learned from Outbreak Investigations: Barriers and Management Suggestions," which focused on the anatomy of an outbreak investigation. He discussed problems that can occur during outbreak investigations and outlined ways to converge on these problems.

William Marler, of Marler Clark LLP PS, presented "Food Safety in the US: Does Litigation Help?" in which he outlined several cases in which individuals had become ill after consuming different food products. During his talk, he discussed industry standards and how they improve after a foodborne illness outbreak.

James Gorney, of the United Fresh Fruit and Vegetable Association, concluded the first half of the session with the topic "Reaction After an Outbreak: A Case Study of an Industry Response," during which he discussed the concerns related to produce safety and reasons for the occurrence of foodborne outbreaks related to produce. He also discussed current produce food safety research and the industry action plan as it relates to educational outreach.

Steven Grover, of Burger Kings Brands, began the second half of the session with "Preventing Outbreaks: Creating a Culture of Food Safety," which emphasized the importance of food safety for Burger King Restaurants. Steven stated, "Food safety is non-negotiable; all Burger King food, packaging and promotional produces must be safe," and emphasized that knowing the supply chain and distributors; having a confident product development chain; possessing new technology, updated HACCP plans and modern sampling systems; and providing education at the restaurant level are key items that every company should have.

Dr. Christine Bruhn of University of California – Davis followed with "Post-Outbreak Consumer Fallout" in which she explored how the media influence consumer opinion and buying habits. During her talk, she reported several studies showing how consumer opinion about food safety has changed over the past ten years and

how education is needed to allow the use of new food safety technology (e.g., irradiation). Over 70% of United States' population think that our food is safe, hand washing and promptly refrigerating food now are seen as important for keeping food safe (compared to 1990), and in one study youths were found to follow better food safety practices than adults (e.g., using a thermometer and cooking meat to well done).

Dr. Douglas Powell, of Kansas State University, finished up the morning session with his talk on "What Makes a Good Story? Media Reaction to Outbreaks," which showed how messages conveyed by educators of food safety need to be compelling to the audience and to capture the audience. He displayed Web sites and news articles that had made head lines that were popular because they effectively responded to the audience. He stated the need to be proactive, respond immediately to outbreaks, be creative in the message and target menu builders.

S02 – Bacterial Resistance to Antimicrobials: Current Trends and Future Perspectives

Oleksandr Byelashov, Colorado State University,
and Paula Martins de Freitas,
University of California–Davis

Dr. David White (FDA) reviewed the history of antibiotics and the evolution of antimicrobial resistance. Bacterial resistance developed, as expected, according to Darwinian principles. The selective agent, or antimicrobial, screens for resistant microorganisms, which then dominate as the organisms reproduce. The issues in this development include gene exchanges between bacterial species, acquisition of resistance to multiple antimicrobials, antibiotic residues in food, and the overuse and misuse of antibiotics. Globalization of the food trade insures global dissemination and results in worldwide resistance. Several national and international outbreaks of antibiotic-resistant pathogens, particularly *Salmonella*, have occurred. Dr. White said that we cannot avoid antimicrobial resistance but that the wise use of antimicrobials through the coordinated efforts of government, industry and consumers can delay it.

Dr. Paula Fedorka-Cray (USDA) discussed the incidences of antimicrobial resistance in organisms

present in ready-to-eat foods. NARMS coordinates the investigations and surveillance of resistance in isolates from animals, humans and food with the services of the USDA, CDC and FDA. The USDA works with animals, the CDC with humans and the FDA with retail foods. Fedorka-Cray's team works on detecting and characterizing resistance in such pathogens as *Salmonella*, *Campylobacter*, *Escherichia coli* and *Enterococcus*. In ready-to-eat products, *Salmonella* and *Listeria monocytogenes* often survive the processing environment, form biofilms in which they exchange genetic information, and thereby acquire multiple resistances.

Dr. Siddhartha Thakur (FDA) discussed the mechanisms of antibiotic resistance in bacterial cells. These include reduced uptake of the antibiotic, active efflux from the cell, modification of the antibiotic's target, enzymatic inactivation of the antibiotic, sequestration of the protein binding, and metabolic bypass of the inhibited reaction. He concluded that antibiotic resistance is an ever-evolving process that continues to progress.

Dr. Yanhong Liu (USDA) discussed methods of testing resistances and detecting susceptibility genes in bacteria. Genotypic methods are faster and more sensitive than the labor-intensive phenotypic ones. The use of micro array procedures with *E. coli* serotyping has the potential to detect other pathogens and identify their antimicrobial resistance.

Dr. Kenneth Bischoff (USDA) covered antibiotic resistance in meat animals, including public health, complicating resistance and mitigation efforts, and alternatives to antibiotics. The main principle in avoiding antimicrobial resistance is to decrease the selection pressure on the pathogens. Alternatives to antibiotics include immune modulators, feed additives such as probiotics, chlorate and nitro compounds, and bacteriophages.

Dr. John N. Sofos (CSU) explained the use of hurdle technologies to control pathogens and extend the shelf life of food. He divided antibiotic resistance into two phases, stress adaptation and cross protection. Cross protection uses one stress as a factor in adapting to another stress. For example, acid tolerance can increase heat tolerance in microorganisms. The multiple hurdle concept involves several steps of control. For example, in beef jerky processing, which uses salts and spices followed by drying, the combination gives better control than either of the two methods used alone. The challenge lies in optimizing the combination of sublethal hurdles.

S03 – The Canadian Approach to Food Safety

**Bertha Alicia Hernández-Rodríguez,
Universidade Autónoma Chapingo,
and Eb Chiarini, Universidade de São Paulo**

Dawn Lawrence presented an overview of the Canadian approach to food safety. It is similar to the supply chain that is emerging as a unique combination of HACCP in registered establishments (e.g., meat pro-

cessing, dairy, etc.) and national industry-led HACCP-based programs for non-registered establishments. It includes four phases: phase one, national strategy; phase two, program development; phase three, implementation; and phase four, recognition. She emphasized that the challenges ahead will be the implementation of food safety programs, modifying consumer behavior and balancing expectations along the supply chain. Heather Gale focused on the on-farm food safety (OFFS) program for fresh fruit and vegetables in Canada. Canadian Horticulture Council (CHC) represents primary producers and packers. The food safety program addresses potential hazards on-farm, at storage intermediaries and in packinghouses. Currently, the program has eight commodity-specific manuals and eight generic HACCP models. Its developments consist of: generic HACCP model, commodity-specific OFFS producer and packer manual, record-keeping forms and appendices (generic to all commodity groups). She summed up that the CHC has to finish manuals, complete seven more technical reviews and continue pursuing close collaboration and communication with buyers' representatives to understand, influence and meet expectations. Next, Bill Laing talked about the implementation of an On-Farm Food Safety program on the Canadian milk quality program. The program is addressing critical control points (CCPs), standard operating procedures (SOPs), best management practices (BMP) and record keeping. He emphasized that it is necessary to review any producers' concern that has challenged the implementation of the program, such as time, cost, withdrawals, facility, fear, keeping records and maintaining the program. Justin Sherwood discussed the development of HACCP-based food safety programs for retail outlets. This covers all aspects of retail operations, display and preparation. Three areas of need for science-based food safety programs, in warehousing, retail and tracking/transportation were identified. Heather Holland spoke about implementing the repacking and whole food safety program for fresh fruits and vegetables, emphasizing that the program is voluntary and is seeking government recognition and support. Areas of concern include proliferation of and demand for producers to participate, demand for multiple audits, domestic and imported fresh products, and, considering the high cost, low credibility, high frustration, and low participation. She concluded that it is necessary to determine equivalent food safety programs from importing countries. The final speaker, Warren Smandych, representing Canadian Food Inspection Agency (CFIA), spoke about the official recognition of HACCP-based programs, which involves teams from federal, provincial and territorial specialists to develop and implement an official recognition process for these national schemes that assess both the technical soundness of the industry "standards/requirements" and their administrative effectiveness (overall management system, auditor training, certification scheme administration, etc.).

S04 – Verification of Sanitary Design of Food Equipment

**Vanessa Kretzschmar, Auburn University,
and Hudaa Neetoo, University of Delaware**

The purpose of this symposium was to present a general review of the various auditing programs for equipment construction and design, standard operating procedures, and the role of HACCP in equipment design, as well as the existing variations among these different programs. The symposium was thus set up with a view to promoting future development of more food equipment standards and greater consistency across these standards.

Dr. T. Schonrock (3-A SSI) introduced his speech by pointing out that in the year 2000, an estimated 76 million cases of foodborne illnesses were reported to the CDC; these resulted in 325,000 hospitalizations and 5,000 fatalities and therefore highlighted the need to work diligently to lower the incidence of foodborne illnesses. He spoke about the multiple roles of Third Party Standards and Audits in the United States in helping to decrease the (1) chances and incidences of foodborne illnesses, and (2) risks of violations involving product contact surfaces, as well as the regulation of all areas of food safety. Sanitary equipment design not only forms an essential part of the HACCP or TQA plan, it also consequently ensures a wholesome food supply. Dr. Schonrock also mentioned the various sanitary design auditing groups in the U.S., such as 3-A, NSF, UL, USDA/AMS and ABI, and the advantages of having third party standards and audits.

Dr. J. Holah (CCFRA, UK) spoke about the role of European Third Party Standards and Auditing Programs. He mentioned the existence and relevance of the European Council Directive relating to machinery (98/37/EC), a short section of which deals with hygiene and design requirement. The compliance of machinery sold within the EC after January 1995 (the 'CE' mark) was also emphasized, as was the recent adoption of the European "C" level Standard EN 1672-2, "Food processing machinery—Safety and hygiene requirements—Basic concepts—Part 2; Hygiene requirements." In addition, the various certification organizations across Europe, such as CCFRA (U.K.), TNO (The Netherlands), T.U.-München (Germany) and DTI (Denmark), were listed and their functions were identified.

Dr. P. Johnson (OMAFRA), speaking on the role of equipment design in HACCP programs, gave an overview of HACCP systems (GMP and HACCP plans) and equipment design, followed by a discussion of important considerations (general, cleaning/sanitizing, critical food safety, installation and operational) in equipment design. She also stressed the importance of preventive maintenance for performance verification of equipment and closed her speech by emphasizing the importance of food equipment design to prevent hazards and enhance the sustainability of food.

Although many of the talks in this session focused on the design of equipment in dairy plants, which was the center of the symposium, the speakers found ways to give information that was useful to any type of processing facility. The discussions about HACCP plans, GMPs, and SSOPs can become applicable to any sort of food production facility. The speakers in this session thoroughly explained the necessity of a sanitary design and gave sound recommendations for establishing GMPs in the plant. They also focused on methods that were not proper for sanitary design, and offered ways in which those facilities may change their equipment flow or set-up. This symposium, an integral part of the IAFP meeting, gave helpful information not only for dairy facilities, but for all food plants.

S05 – Practical Risk Assessment in the Food Industry

**Silvia Dominguez, Rutgers University,
and Vera Petrova, University of Vermont**

Conducting a microbiological risk assessment provides an understanding of how numerous changes in pathogens, food preparation, distribution, consumption, and population immunity may affect the final risk to the consumer. This symposium showed various examples of practical applications of risk assessment techniques by food manufacturing companies. Joanna Shepherd of Fonterra, New Zealand, presented the company's approach to food safety and illustrated several benefits of risk assessment, including its usefulness in providing valuable knowledge of uncertainties and problems associated with particular assessments and its influence on decision making. Fonterra's approach to risk assessment helps the process of establishing new governmental food safety priorities and policies in New Zealand, which will lead to definitions of food safety equivalence for new products. John Sumner described relevance of risk assessment for the Australian meat industry and outlined advantages of application of qualitative and semi-quantitative matrices for risk characterization and management. Examples of practical application of this approach included establishment of a new cooling regime for large pieces of cured meat and of new manufacturing standards for salami. Alejandro Mazzotta presented microbiological risk management challenges faced by McDonald's Corporation. It is crucial for a global organization to use risk assessment concepts in a practical and efficient manner, and McDonald's successfully uses known techniques for hazard identification and hazard evaluation, with the likelihood of exposure vs. hazard being determined. An additional goal of the company is to anticipate and successfully resolve emerging food safety issues, such as those related to Avian Influenza and *Mycobacterium paratuberculosis*. Verification and validation of new techniques are used as practical tools for final product safety. Roy Betts, of Campden & Chorleywood, UK, described the principles

of industrial microbial risk assessment, which, unlike microbial risk assessment, in general, does not consider dose responses or the effect on the consumer, and is a cyclical, iterative process. Two examples of its application were presented: the effect of process changes on shelf life of chicken rolls, as indicated by growth of psychrotrophic *C. botulinum*, and the determination of the appropriate handling category for lactose powder, as indicated by growth of *Salmonella* spp. Tim Jackson of Nestlé, Switzerland, explained the significance of determination of performance objectives—rather than microbiological specification—for raw materials, through the use of processing criteria (e.g., time and temperature of cooking) or product characterization (e.g., storage temperature). Assessment of raw material risks additionally includes the history of the supplier, achieved through verification audits and history of compliance. The final speaker, John Bassett, of Unilever, UK, stressed the importance of determination of specific performance objectives within a particular food industry, which can be achieved by identification of the most realistic hazards and determination of performance criteria. Unilever uses risk assessment to modify processing techniques, e.g., thermal process, and such changes result in large cost benefits and better food quality.

S06 – Foodborne Viruses and Foodborne Viral Infections: Disease Burden, Epidemiology, Detection and Transmission

Jen Cascarino, University of Delaware, and Lorraine McIntyre, University of Hertfordshire

The foodborne virus and foodborne viral infections symposia focused on the problem of viruses in our food and their importance to food safety. Topics presented included disease burden, epidemiology, detection, and transmission. Marion Koopmans gave an overview of foodborne virus surveillance in Europe. Foodborne viral infections are common, there is an opportunity for hidden transmission, and viruses have the potential to change rapidly. The foodborne virus network in Europe tracks foodborne virus transmission, especially norovirus (NoV). In 2004 a surveillance network, the DIVINE project, was started, followed by the EVENT project, which researches foodborne viruses and develops molecular surveillance. It is essential to internationally “harmonize” an early warning system that has a web-based standardized outbreak reporting database and a sequence matching viral database.

A general overview of foodborne viruses, the disease burden, and epidemiology was presented by Stephan Monroe. Viruses are considered the “other” foodborne pathogens, because there is no replication outside of the host, vigorous replication occurs inside the host, and they are difficult to eliminate through disinfection. NoV

is a common illness often misdiagnosed because routine testing is not available, sporadic cases are not reportable, and samples are not collected. NoV is transmitted through multiple routes, has a low infectious dose, and is difficult to control because of asymptomatic viral shedding.

Employee Health and Norovirus was presented by Jack Guzewich. Between 1998 and 2005, NoV caused the greatest number of outbreaks. NoV is highly infectious (10 million particles per gram in feces and 30 million particles in vomitus can be shed from the host). NoV has a low infectious dose and is easily transferred from contaminated hands to secondary surfaces. A tiered approach in three regulatory settings (farms and packers, food processing and retail settings) examines the risk of transmission, including how much organism is being excreted and how close the person is to the food. Four levels of risk-based employee health, ranging from Level I—a person with active GI symptoms or diagnosed with *S. typhi* or hepatitis A virus—to Level IV—exposure with no development of symptoms assess risk.

David Lees described the European approach to standardization of NoV and HAV testing. Reference labs participating in ring trials (laboratory proficiency) used varied extraction / detection techniques and different amplification targets. Overall there was better performance with use of artificially contaminated shellfish samples (> 70% accuracy) than with field samples. The EU working group approach is aiming for horizontal standardization of all foodstuffs. The Boom method of nucleic acid extraction (GITC and silica) is preferred. Method variation depends on sample type, such as hard surfaces (swab & PBS), vegetables (high pH glycine buffer), or water (nylon membrane filtration); however, amplification is standardized to a one-step real time PCR.

Gail Greening described the survival and persistence of enteric viruses on lettuce and strawberries when culture and real-time qPCR methods were used. Fifteen days post-inoculation, there was no reduction of NoV on lettuce or strawberries, and slight reductions of Adenovirus (on strawberries) and HAV (on lettuce). Washing in water for 2 min caused 2–4 log reductions for all pathogens.

Lee-Ann Jaykus described methods to measure the survival, persistence and transmission of enteric viruses on food preparation surfaces. Stainless steel, formica and ceramic coupons inoculated with HAV, FCV and GI, GII NoV were used to measure viral persistence and transfer to lettuce (wet and dry) at different weights. Some results described were that HAV and NoV (GII) persisted on surfaces (42 and 21 days respectively), water facilitated transfer of virus, and FCV was found to be a poor surrogate for NoV. Fingerpad studies showed no loss of NoV after 120 min; however, liquid soap and water rinses produced one-log reductions in viral load.

S07 – Surrogate Microorganisms: Selection, Use and Validation

**Joshua Gurtler, University of Georgia,
and Arpan R. Bhagat, Purdue University**

A surrogate microorganism is one that is put in the place of another, or a suitable substitute microorganism that may be used to model the growth, metabolic processes or death of another. An overview of surrogate microorganisms was presented by Peter Slade. Surrogate microorganisms should not be confused with indicator microorganisms, which intrinsically occur in an environment or food matrix and are closely associated with either product quality or another microorganism that may be present. Surrogate microorganisms are often used in food systems or environments (solid, liquid or gas) to model the behavior of other microorganisms that are unsuitable for test inoculations because of limiting factors such as cost, pathogenicity, or the difficulty or inability of culturing them. Surrogate microorganisms may provide information useful in determining food product quality, shelf life, and safety, and may be used in challenge studies, environmental, process and systems evaluation, and validation of critical limits associated with critical control points in a HACCP program. Dr. Bassam Annous discussed selection and validation of surrogate microorganisms, while Dr. James Dickson explained the development of surrogate microorganisms for use in meat systems. Desirable characteristics of surrogate microorganisms include non-pathogenicity, high microbial yield, financial feasibility, relative ease of preparation, enumeration and differentiation in mixed cultures. Surrogate microorganisms are typically used after incubation to the late logarithmic or stationary phases of growth. When surrogates are aerosolized, even non-pathogenic microorganisms may pose a health hazard. For this reason, when used in aerosolized systems, bio-safety level 1 (BSL-1) microorganisms are often upgraded to the BSL-2 designation, and BSL-2 microorganisms are often reclassified as BSL-3. Estathia Papafragkou explained the relevance of surrogates in studying human enteric viruses, most of which are non-culturable. Reliable surrogates for enteric viruses are widely unavailable. Some viruses that have been used, or have potential for use, as surrogates include polioviruses, RNA-specific bacteriophages and virus-like particles. Human enteric viruses can be detected only via molecular techniques, which provide no information about infectivity. The Feline calicivirus has been used as a potential surrogate for human noroviruses. Recently, the first mouse norovirus was discovered, which is genetically more close to the human noroviruses and which can be cultured, and its use seems very promising for studying the environmental behavior of the human noroviruses. There is still a great need for the discovery of a susceptible cell line for culturing norovirus. Until that time, male-specific coliphages will serve as a suitable alternative for specific uses because they can be easily

handled. Timothy Freier and Jeffrey Kornacki presented "Industry Case Studies, Applied Use of Surrogate Microorganisms." Surrogate microorganisms may be useful to replace undesirable spoilage organisms for evaluating product quality and shelf life, as well as in studies used to evaluate growth and survival kinetics of microorganisms in food matrices in factory environs. Although the FDA and USDA have encouraged the implementation of surrogate microorganisms to validate critical limits, surrogate microorganisms should be considered a last option for use in food processing plants. A suitable alternative would be a pilot plant study in a controlled environment with minimal human exposure.

S08 – Spores, Spores, and More Spores... What is Spoiling My Ready-to-Drink Beverage? Is It *Alicyclobacillus* or Heat Resistant Mold?

**Raquel Lenati, University of Ottawa, Canada,
and Su-sen Chang, Washington State University**

Ready-to-drink beverages have typically been free of spoilage problems, as the pasteurization process and pH are sufficient to inhibit the growth of pathogens and other spoilage microorganisms. *Alicyclobacillus* spp. and heat resistant mold (HRM), however, are thermotolerant microorganisms with the ability to survive these processes and produce off-flavors. This symposium focused on the current issues and control suggestions for reducing the impact of these spoilage microorganisms on the ready-to-drink beverage industry.

Dr. Nancy Jensen (CSIRO, Australia) gave an overview on the Australian perspective of *Alicyclobacillus* spp. Dr. Jensen declared that producers of guaiacol, a phenol compound with an offensive smell, should be the focus of quality testing. Although detection methods are still problematic, BAT and K media, as well as production of taint on apple juice agar (AJA), were suggested for presumptive identification/screening of taint-forming *Alicyclobacillus* spp. isolates.

Dr. Yuhuan Chen (FPA) followed with a review of the work done in the U.S. From their most recent project, it has been concluded that the risk of spoilage is posed by multiple strains of *Alicyclobacillus* spp. and that those beverages susceptible to *Alicyclobacillus* spp. spoilage range from acidic juices to isotonic sports drink.

In another perspective from Australia, Dr. Ailsa Hocking started with an update on methods for detecting and identifying HRM in beverages. Though HRM are not as heat resistant as bacteria, screening should still be conducted with filtration followed by a long incubation time (30 days). Continuing in a second presentation, Dr. Hocking focused on factors affecting heat resistance of HRM, reviewing ascospores, their resistance to the many industrial process available (i.e., UHT, HPP, pasteurization), and the role of their maturity in their resistance.

Dr. Kathleen Lawlor and Dr. Jay Schuman from PepsiCo introduced hands-on approaches for controlling spoilage microorganisms in the industry. Dr. Lawlor described the Total Systems Approach they have in place. She mentioned the various potential sources of *Alicyclobacillus* spp. (e.g., water, sweeteners, salts, colors, teas, flavors, soil, equipment and personnel), and how processes such as concentration/dehydration, acidification, pasteurization, hot holding and slow cooling applied in the ready-to-drink beverages industry select for *Alicyclobacillus* spp. Thus, "aerial and ground view" analyses of the process are crucial for identification of process critical points and reduce juice products spoilage incidences. With "zero tolerance" approaches not feasible and global standard methods not yet available for *Alicyclobacillus* spp., the industry seems to be focusing on a method based on guaiacol production, because confirmation tests are essential.

Dr. Jay Schuman concluded the symposium with a presentation on effective control strategies for HRM in high acid beverages. He took the audience through a system approach pathway, leading us through several quality control points, starting with fruit washing and ending in terminal pasteurization and distribution. In summary, the best approach when it comes to spoilage microorganisms is the 4K: (1) Keep them out, (2) Kill them if you can, (3) Keep the rest from growing and (4) Keep vigilant!

S09 – Biosecurity at Retail

**Brian Kim, University of California–Davis,
and Sarah DeDonder, Kansas State University**

Everybody expects a safe and plentiful food supply as well as an effective system of delivery to our tables. To achieve this objective, the subsistence chain must be protected and maintained. Unfortunately, ever since the war against terrorism began, our food pipelines have faced an asymmetric warfare. This symposium attempted to explore the compositional elements behind this asymmetric warfare and discussed options to mitigate the problem. The talk envisioned a successful food defense, in which all players within the food supply chain effectively counter intentional adulteration with unknown agents. The importance of communication and cooperation between various governmental agencies, industry players, and consumers was stressed by the panel members. A solution against this warfare was explained to be geared toward making the contaminative actions unattractive and difficult for the perpetrators. The session speakers underlined the importance of methodically assessing the vulnerabilities of an asymmetric attack with an outcome of an effective food defense plan. The defense plan is explained to be flexible while containing elements to prevent, prepare against, and respond to a breach into the bio-security in our food supply and distribution systems. The panel members also addressed the importance of using the media to clearly

communicate the processes of carrying out the defense plan against a terrorist attack. Consumers' attitudes and expectations regarding the execution of the defense plans were also described during the symposium. Surveys revealed consumers to be reluctant in taking on the financial burden of carrying out the food defense plans. Consumers are more open to placing the responsibilities of executing the plans on the government and on manufacturers and processors. The session speakers clearly relayed the importance of having an effective bio-security process at retail, while conveying the difficulties that must be overcome to protect our food pipeline.

S10 – Disaster Preparedness and Response

**Armitra Jackson, Iowa State University,
and Angela Laury, Texas Tech**

Candace Jacobs of H-E-B Grocers began the morning session with "Disaster Preparedness," providing several suggestions and guidelines that H-E-B uses to help with easing disaster events. She emphasized the importance of good communication when events occur, having a written disaster plan and practicing the plans, the importance of providing community outreach in times of need, and always taking care of your employees.

Art Johnson of CanStar Restoration presented "Assessing the Damage," in which he describes what the aftermath of a disaster looks like. He emphasized the need to bring in experts to assess the damage, because a business never knows what is in the walls or under the floors or in the ceiling. He showed how fires, insects and rodents, floods, drug laboratories, and rapid micro-organism growth can cause major problems for companies. He further emphasized that restoration companies that businesses call need special certification to perform some restoration jobs, and if the job is not properly done, then more trouble can occur in the future.

H. Wayne Derstine of Environmental Administrator concluded the first half of the session with "Food safety issues that arise after a disaster," in which he discussed how the aftermath of a disaster can influence change for companies. He emphasized the importance of knowing your business operation and having a planned strategy for handling food safety problems when they arise.

Tim Gutzman of Ecolab, Inc. presented "Ready to Reopen," during which he discussed the recovery process, the disposal of retail, and the importance of the clean-up process. He also outlined helpful resources that are available to individuals after a disaster.

Shirley Bohm of the FDA spoke on the topic "Clean-Up after Hurricane Katrina." This pictorial presentation gave the audience a glimpse of the aftermath of Hurricane Katrina and the clean-up process. The speaker addressed the disaster recovery issues, which included structural damage, pest problems and lack of staff.

Zeb Blanton, Jr. of the Florida Department of Agriculture and Consumer Services concluded the session with the topic "Case Study after a Food Safety Disaster." His presentation addressed the four hurricanes that Florida experienced in a six-week period. This pictorial presentation demonstrated the effects of the hurricanes and the rebuilding process. He also discussed the millions of pounds of food destroyed. He stressed the importance of officials having ID badges, communication during times of disaster, and supplies such as water, ice and food.

S11 – Symposium on *Enterobacter sakazakii*

**Joshua Gurtler, University of Georgia,
and Sarah DeDonder, Kansas State University
School of Veterinary Medicine**

Enterobacter sakazakii, known to contaminate powdered infant formula, is responsible for rare cases of severe morbidity and 35–80% mortality rates in infected infants. Relatively little is known about the pathogen's epidemiology, pathogenicity, occurrence and survival in powdered infant formula, although studies are being conducted in these areas. Chris Braden explained the clinical and epidemiological significance of *E. sakazakii*, which is responsible for 1.2 cases of infection per 100,000 infants/year, and 8.7 cases per 100,000 low birth weight infants/year. *E. sakazakii* tends to infect premature and low birth weight neonates, can lead to meningitis, is associated with necrotic enteritis, and has been isolated from tracheal aspirates of infants with respiratory problems. Larry Beuchat discussed the survival and growth of *E. sakazakii* in dry and reconstituted infant formula and cereal. A decrease in viable *E. sakazakii* directly correlated with increases in a_w and temperature in dried products. Growth occurred in reconstituted infant cereals and infant formulas stored at 12, 21 and 30°C but not at 4°C or in infant cereals reconstituted with apple juice. Mary Alice Smith detailed studies with mouse models inoculated by oral gavage to assess *E. sakazakii* pathogenicity. CD-1 mice were most susceptible to *E. sakazakii*, which was isolated at a higher frequency from their internal organs, and these mice may serve as a model for *E. sakazakii* infection. Jeffrey Farber explained current investigations into non-primate animal models to assess *E. sakazakii* virulence and pathogenicity. Chicks, gerbils, guinea pigs, piglets, rabbits, and neonatal gerbils and rats were orally challenged with the pathogen. Gerbils were the most susceptible to the pathogen, and more research is being conducted on the gerbil as a neonatal model for *E. sakazakii*. John Guzewich discussed current approaches to investigating *E. sakazakii* infections. Between 2001 and 2005, the US Food and Drug Administration, Centers for Disease Control and Prevention, and state/local public health agencies investigated at least 16 isolated cases of *E. sakazakii* infections in infants. The pathogen, in some cases, was detected in the preparation area, on utensils

used to mix formula, and/or in opened containers, but not in unopened containers of powdered infant formula. The FDA is now proposing the use or development of analytical techniques and development of a standard reporting tool to guide investigations, along with an accompanying questionnaire. Karl Olson (Abbott Laboratories) gave an industry perspective on the safety and integrity of powdered infant formula. Although *E. sakazakii* is rarely found in processing plants, it has been isolated from the tires of factory forklifts, and from a leaky water pipe, as well as from sugars and gums. Studies are being conducted to find a sterile liquid formula that will serve the nutritional needs of neonates. Measures are also being taken to ensure that only powdered infant formula of the highest quality and integrity is released to the consumer. Safety provisions include the use of HACCP, training and awareness programs for employees, an environmental monitoring program, plant sanitation, air quality testing, GMP/procedural analysis, and state-of-the-art *E. sakazakii* testing.

S12 – *Campylobacter* – From Gate to Plate

**Sandy Moorhead, University of Guelph,
and Melinda Hayman, Penn State**

Joseph Shebuski opened this session by discussing the 'emerging' threat of *Campylobacter* to human health. With many countries actually displaying a decrease in *Campylobacter* related foodborne illness over the past few years, 'emerging' now appears to be a misnomer in describing this pathogen. Dr. Shebuski outlined industry measures introduced within the US, including HACCP and processing changes, which have contributed to the decrease in contamination levels of *Campylobacter* on broilers, relating this to the decrease in incidence of human illness. Despite the decrease in human illness, work continues to reduce contamination of food sources other than broilers, with alternative sources of infection including consumption of raw milk, inadequately treated water, contact with pets and farm animals, foreign travel and insect contamination. The incidence of *Campylobacter* illness and species identification is directly related to the detection and enumeration methods employed. Dr. Stan Bailey gave an in-depth presentation on the advantages and disadvantages of qualitative and quantitative methods currently employed. While no one method is preferable to another, there are inherent biases in each type of medium used, and the investigator should be aware of these. Dr. Douglas Inglis then presented data from animal and clinical trials investigating the colonization, shedding, persistence and antimicrobial resistance of *Campylobacter* in beef. Using both conventional and molecular techniques, this laboratory was able to show that colonization occurred in the small intestine of cattle; *Campylobacter* was able to persist for long periods of time in compost (1 year), and there was a correlation of *Campylobacter* shedding from these

animals and a negative impact on human health. The antibiotic resistance study uncovered the disturbing news that approximately 15% of the strains investigated were resistant to erythromycin. Pre-harvest control of *Campylobacter* contamination in broiler flocks was discussed by Dr. Eric Line. On-farm interventions, including animal management strategies, e.g., genetic selection, egg treatments and mono-species farming, were discussed, as well as stress management and litter treatment. Competitive exclusion, which works well for *Salmonella* reduction but less effectively for *Campylobacter*, prebiotics and probiotics were also mentioned. Direct anti-pathogenic strategies suggested included antimicrobial proteins, bacteriophage therapy, metabolic inhibitors (e.g. chlorate), incorporating activated charcoal as a dietary supplement, and vaccination. Following on from these pre-harvest interventions, Dr. Mark Berrang continued with a presentation on control of *Campylobacter* in poultry processing facilities. Main sources of contamination in this environment are the live bird itself from internal and external sources, transportation equipment, (i.e., dump coops), and scald tanks. Interference in the escape of *Campylobacter* from the broiler vent, effective sanitation of dump coops, and proper scald tank management would effectively reduce contamination in the processing environment.

S13 – Hygiene and Sanitation Solutions to Manage Evolving Risks

**Ben Chapman, University of Guelph,
and Brae Surgeoner, University of Guelph**

Katherine Swanson of Ecolab provided an overview of the importance of hygiene and sanitation in processing, presenting information about the emergence of hazards impacting the industry and the risk considerations impacting the issue. Highlighted was the focus on Norovirus and allergens as increasingly problematic contaminants. Katherine also touched on the evolution of sanitizers, solutions and management tools. Charles Giambrone from Rochester Midland spoke about the technical aspects of cleaning, including best approaches to processing systems. He suggested taking a full system approach when looking at a process and breaking it down into components for which specific techniques can be assembled. Dwain Leaser of ConAgra spoke about challenges to the management of sanitation programs, focusing on how challenges have evolved in the past decade and how contract cleaning can be used to overcome some of the barriers. Sanitation, once solely in-house, is now a dynamic landscape with respect to personnel, but the concerns are the same. Highlighted in Dwain's presentation were the American Meat Institute's sanitation principles, the most important being sanitary design. Dwain was also a proponent of redundant cleaning as a strategy to address missed contamination. Dennis Bogart of Randolph and Associates provided information on measuring the effectiveness of cleaning

programs, an important aspect in the validation of systems. Dennis suggested that a good sanitation program can be profitable, but there are numerous competing issues that can undermine a program. These include issues above the cleaning manager; crew training; turnover; communication; and the lack of recognition of a clean surface. Dennis gave an overview of the importance of knowing if cleaning protocols worked, and emphasized that making the outcome of a sanitation validation exercise personal to the sanitation crew is important. Larry Goodpasture of Aramark presented a section on contract cleaning and how it may be right for certain companies, especially those experiencing high turnover rates. He stressed that professional outsourced sanitation crews provide consistency of implementation. Larry described keys to success of a contract/management system, including communication, developing a plan and measuring effectiveness. Case studies used to highlight the benefit of contract sanitation crews included audit improvements, changeover time reduction and cost controls. Michael Hansche of JohnsonDiversey spoke about making sanitation times more efficient, and how to measure the differences. Michael spoke about investigating the process, the important of planning the sanitation process, and communication.

S14 – International Food Law – A Global Overview

Bertha Alicia Hernández-Rodríguez, Universidad Autónoma Chapingo, Mexico, and Brooke Whitney, North Carolina State University

Food production, distribution and retail sale are now global activities. Every country relies upon both the import and the export of foodstuffs for trade. Operating in this market is potentially problematic because of differences in food laws and enforcement. Gordon Hayburn began the symposium by giving an overview of UK and European food law. In 1990, the EU created the Food Safety Act and currently, legislation applies to registration of premises, use of HACCP principles, traceability and training. He mentioned that all offenses against food laws are "criminal" offenses. Dr. Hayburn also made the point that few lawsuits are brought against food processors and handlers on the basis of outbreaks of foodborne diseases in the UK. William Marler, Esq. discussed food safety legislation and enforcement practices in US. He began by commenting on the previous speaker, pointing out that differences in the health care systems between the two countries may be one reason why the US sees more litigation surrounding outbreaks. He also provided statistical data on hospitalized people and deaths related to contaminated food. He detailed some of the law surrounding civil litigation, such as strict liability and negligence, as well as some of the tools that lawyers have at their disposal in prosecuting such cases. Mariza Landgraf from the University of São Paulo

provided a perspective of food safety legislation and enforcement practices in Brazil. The two main ministries in charge of food law are the Ministry of Agriculture and the Ministry of Health. The Ministry of Agriculture is responsible for food and quality of products. Some of the Ministry's programs are Pathogen Reduction, National Prevention of Avian Influenza, and the National Program for the Control and Eradication of *Brucellosis* and *Tuberculosis*. The Ministry of Health is responsible for regulation of foods starting at the processing plant, although both ministries share some responsibility in this arena. In recent years, food quality and safety in Brazil has increased, and Dr. Landgraf attributes much of this success to the cooperation of the two ministries. Elna Buys from South Africa spoke about food safety legislation in Africa. Most of the talk was devoted to South Africa, describing the structure of the legislative system. One interesting point she made was about the Dairy Standards Agency, which is not a government agency but one developed as the result of negative press several years ago that has been successful in keeping the dairy supply well-regulated. She outlined other African countries' food safety programs, citing that many are relatively new, while some countries have yet to begin one, such as Ethiopia, Senegal and Gambia. Deon Mahoney concluded the session with Australian and New Zealand approaches to food safety legislation. The important food regulations drivers in Australia are the global food supply, processed foods, Australian and New Zealand joint food standards, and the Ministry Council. He mentioned that some important current enforcement issues were ensuring that the gaps between state and territorial regulations are covered and that when overlaps occur, all parties are in agreement, and that there is consistency with regard to enforcement practices. The British Food Journal has invited all speakers to submit their presentations as papers for a special issue, so those articles can be expected to be published in the future.

S15 – Foodborne Disease Update

**Melinda Hayman, Penn State,
and Elizabeth Hillyer, University of Guelph**

Outbreak information and control measures regarding *Salmonella* Enteritidis, *Vibrio* and *Cyclospora* were presented by Andrea Ellis, Jeff Farrar, John Painter, Roberta Hammond, Brent Dixon and Jack Guzewich. In May through October 2005, several provinces in Canada saw an increase in *Salmonella* Enterica Enteritidis phage type 13 infections associated with mung bean sprouts. It was initially thought that the outbreak was due to eggs or chicken; however, adult females were most affected. By the conclusion of the outbreak, there had been 552 cases, 59% of them female, and 30 hospitalizations; the mean age was 31 years, and mung bean sprouts were identified as the vehicle of transmission. Only 45% of the patients had known exposure to mung bean sprouts, but mung beans could be an ingredient in various foods, and many people could have eaten bean sprouts unknowingly.

It was recommended that in future, sprouts should be cooked before consumption, vulnerable populations should avoid eating bean sprouts, and investigators should ask infected persons about the possible consumption of sprouts.

The effect of Californian regulations to require treatment of gulf coast shellfish and the success of intervention strategies in reducing *Vibrio*-related illness was presented. *Vibrio vulnificus*, associated with gulf coast oysters, causes several annual cases in California of a severe disease, with a ~90% hospitalization rate and over a 40% fatality rate. In 1992, a retail warning was introduced for raw gulf coast oysters, but this did not reduce the incidence of *Vibrio* infections. The state of California introduced regulations that restrict the sale of raw gulf coast oysters April through October, unless the oysters have undergone a lethality treatment, such as HPP or pasteurization. Raw oysters must be accompanied by a warning, in English and Spanish, to help eliminate *Vibrio* infections in California.

An outbreak of *Cyclospora cayatanensis* was reported in Florida, USA between April and May 2005. During this outbreak, 592 cases were identified; 38% of these cases were epidemiologically associated. Multi-ingredient foods were associated with illness, but all included fresh basil. Basil was considered "a stealth ingredient" since it is common in many foods and because consumers often are not aware that they are consuming basil. Similar outbreaks involving imported fresh basil occurred in Canada in 2005, with 191 confirmed cases in three outbreaks. Hurdles hindering investigations include the long incubation period for *Cyclospora*, the short shelf life of produce, and the fact that cases are often epidemiologically associated with the outbreak. Following the *Cyclospora* outbreaks, the FDA performed traceback and environmental investigations to determine the source of the contaminated basil. The basil implicated in the Florida and Ontario outbreaks was traced to the same distributor and a single farm in Peru. Improvements on the farm included water quality and worker health and hygiene. The FDA and CDC continue to monitor this situation. Future outbreaks involving fresh basil and other imported foods can be expected as the result of wide distribution, the global market, the need to import foods, and the consumer's expectation of purchasing out-of-season produce.

S16 – Contamination of Ready-to-Eat (RTE) Foods: Transfer and Risk – *Listeria monocytogenes* and Other Microorganisms

**Olekasandr Byelashov, Colorado State University,
and Hudaa Neetoo, University of Delaware**

The symposium discussed recent studies in Europe and the US on microbial contamination of ready-to-eat (RTE) foods, with emphasis on *Listeria monocytogenes*. It showed that RTE food processors can prioritize sanitation control measures and assess risks by the use of mathematical models.

Dr. Draughon presented the risk assessment of *L. monocytogenes* in RTE meats and poultry. Eight thousand sliced or prepackaged RTE meats collected from four states with FoodNet sites were screened for the presence of *Listeria monocytogenes*. Fifteen percent of USDA prepackaged and 1.23% of deli-sliced samples were found positive for the pathogen. Drs. Dean Cliver and Maha Hajmeer at University of California—Davis were responsible for the California samples, Dr. Ann Draughon at University of Tennessee for Tennessee samples, Dr. Omar Oyarzabal at Auburn University for Georgia samples, and Dr. Elliot Ryser at Michigan State University for Minnesota samples. Dr. Draughon estimated consumer exposure to *L. monocytogenes*, using these data and taking into account other factors such as pathogen growth rate at refrigeration temperature and demographic parameters.

Dr. Jaykus presented a mathematical model of consumer exposure to *L. monocytogenes* in deli meats and found that, of the factors involved, contamination with the pathogen during retailing and temperature abuse had the highest correlation with mortality. Deli meats are high-risk foods, and consumers who violate safe food handling practices risk mortality from listeriosis. She concluded that consumer food safety education can reduce the risk.

Dr. Perez-Rodriguez presented risk assessment methodology useful in protecting foods from *L. monocytogenes*. He evaluated nine scenarios of cross contamination during retail handling. Mathematical models were used to estimate the risk and identify the scenarios likely to degrade food safety. The study showed the potential of use of contamination scenarios in risk assessment and ways to model the most effective food processes and handling during manufacturing and retailing.

Dr. Smith evaluated the significance of the routes of microbial contamination of RTE foods during manufacturing by examining the sources of contamination in cooked sliced ham, cooked pasta and leafy salad. The vectors of transfer were the air, liquid aerosols, stainless steel contact surfaces and the hands of the handlers. Vector microbial loading and time of exposure were the key factors determining contamination scenarios.

Dr. Van Asselt quantified recontamination through air, biofilms and cross contamination in consumers' kitchens and developed a mathematical model for air contamination for use in RTE food manufacturing. Factors affecting the rate of contamination included the initial number of bacteria in the air, setting velocity, and the area and time of exposure. She also presented a predictive model of cross contamination in the kitchen.

Dr. Todd presented quantitative assessments of the transfer of *L. monocytogenes* between deli meats, slicing machines, knife blades, and conveyor belts. The study showed that the transfer of the pathogen occurred mainly during the slicing of the first ten slices and only sporadically thereafter. The conveyor belt materials did

not affect the transfer rate, but the moisture content of the RTE meat did increase it. Much of the slicer area was contaminated during slicing of the inoculated product. Comparing direct and sequential transfer rates of *L. monocytogenes* between inoculated RTE meats and cutting blades, he found that higher transfer occurs from a knife blade and salami compared to other types of RTE meats. Persistent strains more easily attached to food contact surfaces and formed biofilms than did non-persistent strains. He presented a mathematical model that describes the transfer of the pathogen during slicing.

S17 – Role and Application of International Standards in Supporting Food Safety Management and Testing

Bertha Alicia Hernández-Rodríguez, Universidad Autónoma Chapingo, Mexico, and Azadeh Amvar, University of Guelph

Albert Chambers gave an overview of ISO 22000—new standards for food safety management. He explained that 22000:2005 is a management system standard (based on ISO 9001:2000), which is specific to food safety management, based on the codex HACCP approach with some innovations and designed for segments of the food chain and all types of food businesses (micro to global). He concluded that ISO 22000 is international and meets the needs of food businesses, customers and regulators. Christine Bedillion, who represented NSF International, spoke about audit and certification requirements for food safety management systems (FSMS) (ISO 22003). She presented the differences between certification and accreditation: Certification is a written assurance, while accreditation is formal recognition by a specialized body. She concluded that consumers are confident that the food supply is as safe and secure as possible, and offered assurance that the organization has implemented a system for the management of food safety. Mark Carmody discussed the implementation of ISO 22000. He talked about competence and qualification, the first based on food safety in auditor certification demands and the second on evidence of an audit report. He summed up by stating that the future of food safety auditing is essentially that auditors will need to speak and understand business language and emphasize auditing to the required industry. Dawn Mettler, representing the American Association for Laboratory Accreditation (A2LA), spoke about the benefits of laboratory accreditation (ISO 17025:2005): international recognition of technical competence, a legal defense system and marketing advantage. Sharing similar quality system management criteria with those of ISO 9001 and ISO 22000, ISO 17025:2005 extends these standards with additional requirements for the technical management of the product testing process. Cathy Burns presented the experience of an FDA laboratory with ISO 17025:2005 as laboratory accreditation. The advantage is a defined system that assures consistency, with no change in

organizational structure of business, low expenses, training programs, quality assurance program, measurements and testing, as well as equipment traceability. She concluded that the success of the implementation depends on the support and commitment of management. Molly Mills concluded the session with a presentation on a commercial testing laboratory's experience with ISO 17025:2005 accreditation. The main point is that a quality system includes criteria for equipment, environmental conditions, method validation, sampling, handling of test items, measurement traceability, reference standards/reference materials, control of data, and assuring the quality of test results. ISO 17025:2005 accreditation in a food-testing laboratory provides third-party demonstration of competence and the ability to produce technically valid results.

S18 - A New Crack at Egg Safety: From the Hen House to Your House

**Laura J. Bauermeister, Auburn University,
and Joshua Gurtler, University of Georgia**

This session provided insight into the forthcoming food safety-based regulations to be implemented in the egg industry. Dr. Potter from the Food and Drug Administration (FDA) spoke about the new regulations and guidelines that would be implemented for on-farm control of *Salmonella* Enteritidis (SE) in laying hens. The minimum requirements of the proposed SE Egg Rule include replacement stock; storage of eggs kept for 36 hours post-lay at or below 45°F, and microbial, environmental and egg testing. Also, he indicated that the FDA is monitoring avian influenza and the role it will play in regard to food safety. Dr. Latimer from the United States Department of Agriculture Food Safety and Inspection Service (USDA FSIS) reported on the FSIS Risk Analysis of SE in Shell Eggs. The risk assessment process includes hazard identification, exposure assessment and policy development. She guided the audience to the Egg Products Model on the USDA FSIS Web site. Hillary Shallo Thesmar of the Egg Safety Center gave a brief overview of the egg industry, including production and company demographics. She highlighted some of the changes that have occurred in the egg industry over time, such as consolidation (fewer companies producing more eggs), inline packing and processing facilities, state QA programs and HACCP programs. Regulatory responsibilities of the FDA and USDA involving the production of shell eggs and egg products were outlined, and the existing programs, such as United Egg Producers Five Star Program, State QA programs and Safe Quality Food, were discussed. Dr. Musgrove of the USDA Agricultural Research Service (ARS) spoke on the microbiological effects of shell egg processing. His research focused on the impact of processing on the microbial populations of shell eggs. He found that microbial populations were reduced after the first wash and remained low throughout the packaging process. Dr. Jones of the USDA ARS spoke

on the assessment of shell egg processing facilities sanitation practices. She reported data from in-line, off-line and mixed operation type of egg facilities. Upon comparing Aerobic Plate Count and *Enterobacteriaceae* counts on non-egg contact surfaces post operational and pre-operational after sanitation programs were completed, she reported no differences. She indicated that plant traffic and sanitation programs may need to be reevaluated to help reduce cross contamination. Dr. Gast of the USDA ARS spoke about the detection and control of *Salmonella* in laying chickens. He discussed the challenges in controlling *Salmonella* in poultry. These challenges included the fact that *Salmonella* infections are not apparent in poultry, newly hatched poultry are very susceptible to *Salmonella* colonization, *Salmonella* serotypes have a wide host range and are environmentally persistent, and poultry houses are made of materials that make disinfection difficult. This symposium provided a great deal of insight into egg processing and further processed products and the regulations that are being developed for the egg industry.

S19 - Cleaning and Sanitation for Retail Food Safety - Identifying the Issues

**Ben Chapman, University of Guelph,
and Brae Surgeoner, University of Guelph**

Donald Schaffner of Rutgers set the stage for the symposium on the current situation and best practices for cleaning and sanitation (C&S) with an overview of the key 2005 FDA Model Food Code definitions (risk, ease of cleanability, sanitization). He highlighted the contributing roles of holding temperatures, personal hygiene, cooking temperatures and contaminated equipment in foodborne illness outbreaks, and emphasized that small levels of contamination may increase exponentially.

Sharon Wood, representing H-E-B Grocery Company, explained that perhaps the most significant C&S challenge in the retail industry is keeping a top-of-mind awareness about sanitation in a sales-driven environment. Wood discussed C&S opportunities for specific grocery store departments and suggested that successful solutions to sanitation problems are grounded in an intimate knowledge of the business, good partnerships with chemical suppliers, open communication with key stakeholders, and visible in-store quality assurance and food safety personnel.

Harold King, from Chick-fil-A, identified several C&S concerns, including the unique challenge of preventing the spread of germs in children's play areas and the oft-cited problem of employees reporting to work ill, either because they are asymptomatic or because they cannot afford to miss a shift. King stated that C&S challenges will only increase as exposure rates (customer volume) continue to increase, and concluded by stating that restaurant management must repeatedly ask, "How do we better enable validation of the effectiveness of the sanitation in our restaurants?"

Shirley Bohm from the FDA/CFSAN provided a primer on sanitizers and pesticides, including definitions; laws and regulations; and the roles of government agencies. She continued with a discussion of the importance of sanitation in the light of produce safety, *Listeria* control, disaster recovery, and Norovirus clean-up, as well as sanitation as the foundation of HACCP. Bohm stated that future regulatory direction will examine inconsistencies in EPA regulations and the FDA Food Code, as well as focus on chemical parameters other than ppm.

Harry Grenawitzke, with the National Sanitation Foundation (NSF), discussed the sanitary design of retail food equipment. He provided an overview of the NSF Food Equipment Program, whose purpose is to verify that equipment conforms to performance standards as developed by manufacturers, end-users and regulators. NSF certification includes a review of the equipment's design and construction, an evaluation of food-contact materials, and when applicable, performance testing. NSF has 22 food equipment standards.

Allan Parker, representing JohnsonDiversey, concluded the symposium with a presentation on training programs for C&S in retail food establishments. Parker suggested that sanitation training is often overlooked and that most programs fail to teach how to clean and sanitize effectively. Although he acknowledged that employee turnover was a major barrier to investing in C&S training, Parker likened it to purposeful spending, in which the asset will increase in value over time. He also recommended that C&S training focus on informal methods such as 1-on-1 training, and that measurements be developed for C&S to help gauge program effectiveness.

S20 – Public Health and Environmental Impact Assessments in the Aftermath of Hurricanes Katrina and Rita

**Ben Chapman, University of Guelph,
and Brooke Whitney, North Carolina State University**

Jon Bell began the session by describing the hurricane effects outside Louisiana and within the state. Hurricane Katrina was remembered the most, and Rita's impact lost, a phenomenon termed *Rita Amnesia*. The focus of the symposium was on seafood safety, how the hurricanes have impacted the seafood industry, and what barriers exist for the industry in the future. Jon suggested that there was unjustified media attention on the possible existence of a toxic soup in the coastal and inland waters of Louisiana. The perception, which has been problematic for the industry, was not based on science, but rather was the result of poor risk communication. Jon also stressed that the individual losses were staggering, especially in the area of equipment, including an estimate of up to 80 per cent of seafood vessels destroyed or damaged. Rebecca Buschon, speaking about a US Geological Survey study of the ecological and human impacts of the hurricanes, highlighted the temporary loss of drinking water, the disruption of waste water systems, and the

dislocation effects of the events. Even as long as a month following the hurricanes, many areas still did not have operational drinking water systems. Water quality samples were taken at 22 sites and analyzed for indicator organisms, which varied from site to site because of regulatory differences. It was found that the fecal indicators were generally low following the events and that localized contamination, apparent initially, quickly dissipated. Sampling continues, but levels are back to historic norms. Communication has been difficult, and public perception has been that water is still problematic. Kimani Kimbrough spoke about pollutant concentration studies, focusing on mussel surveillance. The program has a database of information going back 20 years at 280 oyster sites. The program researchers sample for 120 contaminants including trace elements, pesticides, PAHS and industrial chemicals. Thirteen sites in the Gulf of Mexico saw a decrease of organic contaminants similar to that seen on a national level. One industrial site did see an increase, but levels were not highly elevated. Robert Dickey of the US Food and Drug Administration (FDA) spoke about the storms' impacts on the 1,700 FDA-regulated firms in the affected regions and stressed that there was a coordinated response to assess the environmental impact and determine the magnitude of any potential problems. FDA staff, in the field for 7-day tours, took 518 samples of a variety of species. Samples were tested for various analytes, including PCBs, organophosphate pesticides, hydrocarbons and heavy metals. Arsenic and cadmium were found in concentrations higher than desirable in a small number of samples, but overall contamination rates were not problematic. John Painter of the Centers for Disease Control presented information about *Vibrio* illnesses in the Gulf Coastal region. There was an anticipated increase of infections due to open wounds, but very little cholera was found (as opposed to the number of cholera cases following the recent Asian tsunami), as there had been almost no cholera in the region prior to the hurricanes. Twenty-three cases of wound infections, with four deaths, were seen. Foodborne cases of disease cause by *Vibrio* spp. also increased in the month immediately following the hurricanes, but after that they returned to expected patterns. A substitution effect was seen across the US; a decrease in disease cause by *Vibrio vulnificus* was seen immediately after. John speculated that this was because approximately two-thirds of *Vibrio vulnificus* have historically been found in the Gulf Coast, and stocks were not available or being consumed at the same rate.

S21 – Assuring Microbiological Safety of Organic Products

**Andrea Bianchini, University of Nebraska-Lincoln,
and Lorraine McIntyre, University of Hertfordshire**

What is organic food? Dr. Ewen Todd quoted the traditional definition: organic food follows practices that strive for a balance with nature, using methods and materials with a low impact on the environment.

However, perceived risks in foods do not always match the actual risks, as evidenced by pesticide surveys. Organic foods are growing in popularity: in 2004 there was a 55% increase in organic meat sales in the US, worth \$256 million, and in 2005 organic eggs topped the sale of conventional eggs for the first time in the UK. How an organic farm is defined, labeling fraud, global marketing of organic foods and consumer perceptions about whether foods are organic or healthy are interesting questions.

Dr. Harshvardhan Thippareddi discussed the need for standards in the organic industry. In the US, accredited certifying agents inspect organic processors based on National Organic Program regulations (Title 7- Agriculture). Standards are important to allow consumer product assurance. "Organic" is a production claim, not a content or food safety claim. If no organic ingredient is available, non-organic products may be allowed legally into the product. There is a national list that outlines the label claims and permissible additives.

Dr. Craig Harris discussed the challenges of organic milk and milk products produced by large-scale commercial organic farmers, who have the same problems as conventional farmers (such as ochratoxin A levels), but who use organic techniques. For example, mastitis in organic dairy cows is treated with herbal extracts and compresses rather than antibiotics, and rBGH use is not permitted. While there is no evidence to suggest that organic milk improves health, farming practices are better for the environment and animal welfare.

Dr. Stan Bailey covered the safety challenges involved in the production of organic meat, highlighting the differences between standard commercial and organic systems (free range, free roam) in the production of fresh and processed meat. Consumer perceptions about the commercial industry include beliefs that animals live in crowded conditions necessitating the use of antibiotics. Prevalence data measuring *Campylobacter* and *Salmonella* in chickens reared in both systems indicated less antimicrobial resistance in the organic system; however, free-range chickens have similar or elevated levels of *Salmonella* compared to commercially reared chickens.

Dr. Trevor Suslow discussed the safety challenges in the organic fruits market. Food safety is a priority in these larger, more industrialized processes that have no uniform set of practices. In an organic farmer's survey, weeds were the #1 priority. Some organic farmers manage weeds with ducks, calves or pigs. Fertilizing with compost (and compost tea) is a potential micro problem with run-off. Post-harvest handling processes, such as the use of approved cleaners and sanitizers, as well as materials for organic packing and processing that can help improve the quality of organic produce, were shown.

The session was closed by Dr. Francisco Diez-Gonzalez with a discussion of options for cleaning and sanitation during the production of organic products. Issues with organic processing include the requirement

for a rinse step after the use of most FDA approved sanitizers, which allows for possible re-contamination. Few permitted cleaning and sanitizing agents are listed in the National Organic Standards. There is a need for approval of new sanitizers (such as peracetic acid) and further research into organic sanitizers.

S22 – *Salmonella*: The Saga Continues

Sarah DeDonder, Kansas State University,
and Michelle Danyluk, University of California–Davis

Recently, *Salmonella* has reemerged as one of the leading causes of foodborne bacterial enteric disease in humans. Likewise, it is the only major enteric bacterial pathogen that has not seen a reduction in the number of cases of illness caused in humans. In this symposium, a panel of experts discussed the new issues that have arisen concerning *Salmonella*.

Michael Lynch discussed the trends in foods associated with outbreaks of salmonellosis. Several outbreaks of *Salmonella* infections have been associated with a variety of foods; a review of outbreaks, identifies the foods involved as including tomatoes, meat and poultry, and egg-containing products. Although foods have been identified, more work is needed to gain a better understanding of how the foods become contaminated with *Salmonella*.

Heejong Latimer detailed the enhanced FSIS new risk-based approach for verification activities associated with controlling *Salmonella* in broilers. The FSIS has become increasingly concerned about the upward trend of positive samples found in the broiler class. Therefore, time has been dedicated to readdressing the *Salmonella* Verification Sampling Program. As a result, the FSIS hopes to lessen the public's exposure to the serotypes associated with raw poultry.

Stan Bailey explained the ongoing research efforts of the industry in controlling the presence of *Salmonella* in chickens. The majority of the research is being directed at identifying an intervention method that will reduce the presence of the pathogen. He also detailed the chemical interventions being initiated by the plants as well as the intervention procedures being implemented on the farm. Overall, reduction will be significant only if a multi-faceted intervention is implemented, from the producer to the processor.

Keith Warriner continued the symposium with a discussion of the ecological, physiological and genetic factors associated with the survival and growth of *Salmonella* on tomatoes, specifically examining the question of whether these factors are serovar dependent. Both interaction with tomatoes and persistence on tomatoes were found to be serovar dependent. Also interesting was the finding that the presence of *Salmonella* on tomatoes altered the microflora of the tomatoes.

Paula Fedorak-Cray explained antimicrobial-resistance trends in *Salmonella* in the United States, beginning with the existence of an overlap between animal and human isolates, with *Salmonella* Newport being the most resistant. However, *Salmonella* Kentucky

is a common slaughter isolate, especially from avian sources, but has not been found in humans. The talk ended with a discussion of where to look for new emerging isolates and posed the question of what differences between serotypes and colonial really mean?

Marta Hugas ended this symposium by explaining the European situation and risk assessment perspective for *Salmonella*. She presented the new EU web-based monitoring of zoonosis data, including *Salmonella*, which has found stable levels of *Salmonella* in countries that have been participating in the program for extended periods. Also presented was a baseline study of *Salmonella* in laying hens, a preliminary report of which was published last month; in addition, other potential baseline projects were proposed.

S23 – How Risk Managers Decide on Microbiological Risks from Different National Perspectives

Lorraine McIntyre, University of Hertfordshire, and Brae Surgeoner, University of Guelph

Dean Mahoney, from Food Standards in Australia New Zealand (FSANZ), explained how they use risk assessment outcomes to manage risks. FSANZ sets the food standard code on the basis of scientific risk analysis following Codex guidelines, with consistency between domestic and international standards. FSANZ has no enforcement role; state health authorities handle this. Australia averages 5.4 million cases of food illnesses per year, costing ~\$1 million/year. Cases studies presented included (1) *Listeria* in cooked shrimp; low prevalence in cooked shrimp led to a decision that the micro standard be deleted; (2) a model for reduction of *Salmonella* and *Campylobacter* in the poultry meat chain; (3) analysis of microbial risks (led to) importation of French Roquefort cheese and, (4) raw milk cheese assessments.

Fumiko Kasuga described the history of risk assessment and risk management strategies in Japan. Initially, scientists provided expert opinions and made recommendations to an advisory board. In 2001, the first case of BSE caused criticism of the system and questioned whether scientific evidence was part of the decision process. The Food Safety Basic Law was created May 23, 2003 to allow risk assessment to form policy. By July 2003, the Food Safety Commission (FSC), formed of 16 committees who report directly to the government cabinet office, was created. The FSC deals with issues such as *B. cereus* deaths related to infant formula in low birth weight babies. Currently the FSC is preparing risk profiles for *Salmonella* in poultry and eggs and Norovirus in bivalve shellfish.

Robert Buchanan from the Food and Drug Administration's Center for Food Safety and Applied Nutrition (FDA/CFSAN) presented the United States (US) perspective on how risk managers set risk levels. He discussed the complexity of the country's legal system and explained how robust food safety policy and guidance result from integration of rigorous science and law; the risk levels are set based to a large extent on whether a case would be supported in court based on

the interpretation of the law. Buchanan explained that the role of risk assessment is to provide a means to more systematically array the science and provide quantitative estimates of the impact on potential alternatives and standards. For the development of food safety regulations, knowledge of sensitive populations, information, and the integration of law and science were presented as major challenges.

The final speaker, William Yan, presented the application of microbial risk assessment outcomes in managing risk from a Canadian perspective. Health Canada establishes standards and policies through the Food Directorates' Bureau of Microbial Hazards two main divisions: evaluation and research. Enforcement is handled by the Canadian Food Inspection Agency. Risk assessments can be either qualitative, such as those related to policies on sprouted seeds and beans or unpasteurized fruit juices, or quantitative, such as those related to levels of *Listeria* in foods or *Vibrio* in shellfish. Health risk assessments (HRA) of foods are divided into three levels, and the first step is to determine whether a health hazard, or the potential for a health hazard, exists. Evaluators conduct a scientifically based risk assessment following a modified Codex Alimentarius method. HR 1 is serious or life threatening, resulting in a Class 1 (consumer level) recall, HR 2 is temporary or non-life threatening, resulting in a Class 2 (retail level) recall, and in HR 3 the hazard is not likely to result in any adverse health consequences.

S24 – Food Allergen Control at Retail and Food Service

Elizabeth Hillyer, University of Guelph

This symposium demonstrated the concerns faced by both retail and food service establishments and included presentations by Kathleen O'Donnell, Gale Prince, Donna Garren and Christine Bruhn. An allergic reaction is an abnormal immune-system response whereby the body identifies a protein in the food as foreign. There are no cures for allergies, and the only preventive measure available to susceptible individuals is strict avoidance of the food. In the USA alone, 11 million individuals have a food allergy, and food allergies are responsible for 30,000 visits to the emergency room and 150–200 deaths annually. However, the burden of food allergens extends beyond the individual; the family, friends and surrounding community are all affected by the needs and concerns of individuals with food allergies. Food allergies can affect the skin, the GI tract, the respiratory tract and can also lead to anaphylaxis, which can be fatal. There are eight major food allergens: peanuts, tree nuts, milk, eggs, soy, wheat, fish and crustaceans.

In January of 2006, the Food Allergen Labeling and Consumer Protection Act (FALCPA) stated that retail food labels must identify any of the major allergens in the ingredient list; however, consumers still feel vulnerable when ingredient lists are incomplete or when

products are changed or discontinued. In retail settings, many departments stock foods containing food allergens, mainly in the deli and the bakery. Areas of concern in the retail setting include incorrect food labels, improper cleaning, cooking oils, and product placement. Elements of control are required at the levels of formulation, production, labeling, sanitation and monitoring.

Food service settings are also areas of concern for consumers, because consumers continue to spend more food dollars outside the residence environment. Employees in food service establishments must be constantly vigilant in serving multi-ingredient foods, avoiding cross contamination, and providing accurate ingredient lists for foods. Managers must facilitate open communication with customers in order to ensure the safety of the food that is prepared, and to be aware of possible food allergens in all menu items.

The number of people suffering from food allergies is continually increasing and this is an area of food safety that requires vigilance and complete transparency of all food labels and sources. Communication with the customer and the consumer is of utmost importance in order to maintain the safety of foods that are available to consumers with food allergies.

S25 – Hot Topics in Food Safety

**Joshua Gurtler, University of Georgia,
and Laura Bauermeister, Auburn University**

David Swayne gave an update on avian influenza (AI). Mallard ducks are the greatest reservoirs for AI. After transmission to domesticated chickens, the virus is usually not transmissible back to the wild bird reservoir; however, some recent HPAIV and H5N1 strains go back into wild birds. There have been 24 highly pathogenic AI (HPAI) epizootics in the last 50 years, and over 209 million birds have died or been culled since January, 2004. There is no HPAI known in the US; one farm in Texas was infected with the H5N2 strain in 2004, and the last major US outbreak was in 1983–1984. The H5N1 strain has been recovered from the meat of chicken, duck, Japanese quail and geese, although cooking destroys the virus, which has a D-value of 0.073 seconds at 165°F. Whole vaccines for the H5 and H7 strains, available for emergency use, provide > 90% protection. Since 1998, testing of Alaskan migratory birds has recovered no H5 or H7 strains of AI.

Roger Johnson discussed the significance of non-O157 verotoxigenic *E. coli* (VTEC), which produce shiga-like toxins destructive to vero cells and are increasing with regard to cases and outbreaks of illness in the United States. It is estimated that only 1 in 4 to 8 cases are reported. Although there are over 50 serotypes of non-O157 VTEC, > 90% of serotypes are composed of O157, O26, O145, O111, O103, and O111, the latter of which appears to be the most virulent. The attaching and effacing ability of the pathogens comes from the *eae*-encoded intimin, *Tir* (translocated intimin receptor) and *LEE*. There are VT1 and VT2 variants of the virus, although VT2 is usually not associated with disease. In

Australia, 42% of *E. coli* outbreaks are non-O157:H7 related, and in Japan since 2004–2005, 49% of isolates are from non-O157 serotypes.

Canice Nolan explained food safety developments in the European Union (EU), which is composed of 25 countries and includes 475 million consumers. Currently, hot topics in the EU include avian influenza (AI), genetically modified organisms (GMOs), food defense, hormones, bovine spongiform encephalopathy (BSE), and antimicrobials, although the speaker does not view GMOs as a food safety issue. The EU does not permit the use of hormones in animal production or antimicrobials in foods or food processing. Cases of illness per year per 100,000 population in the EU and the United States, respectively, are *Salmonella* (42 vs. 14.5), *Campylobacter* (48 vs. 20), *Listeria* (48 vs. 20), *E. coli* (1.3 vs. 0.9), *Yersinia* (2.4 vs. 3.9), *Trichinella* (0.06 vs. 0.00). Areas of concern and areas in which improvements are being implemented in the EU include pandemic influenza, improved traceability for food ingredients and foods, new hygiene regulations, dialogues with the US, rapid alerts, bioterrorism, and nanotechnology.

Bob Buchanan provided an FDA perspective on food safety regulatory issues. There is an increasing need for the FDA to derive food safety data from research scientists as well as from the food industry to help influence the formation of governmental regulations. There is also a need for more research to help improve food laws and the safety of foods. Scientific research is among the most important factors influencing the change of food law, although some scientists fear that this type of research will not earn them tenure. Many groups will not collaborate for fear of not being able to publish their data, or because their attorneys have advised them against sharing information, despite the FDA assurance of providing anonymity.

S26 – Quality Control in Research Labs

**Vanessa Kretschmar, Auburn University, and Andrea
Bianchini, University of Nebraska – Lincoln**

The issues involved in the quality control of data collected in reference and research laboratories is always worth discussing so that standards can be defined and applied to assure data reliability, credibility and repeatability. Operation in accordance with recognized quality standards is well established in routine laboratories, but not as much in research labs, a situation likely to change in the near future.

Christina Oscroft started the session by discussing how to apply the concepts of ISO 17025 to applied research, such as food microbiology. Sample handling, method selection, control equipment, recording keeping and personnel training were covered. She also pointed out the importance of having mechanisms to verify if the quality system is properly maintained and how to accomplish this process. Another important point was the benefits of operating under recognized quality standards, such as greater control over research, greater

confidence in results, reduction in unnecessarily repeated analysis, and, most important, recognition of the work.

The following speaker was Arlene Fox, whose talk covered proficiency testing as a tool for laboratory quality assurance. She discussed thoroughly the procedures to develop a proficiency testing (PT) program, including when a new technology is ready to undergo proficiency tests, and how to choose the right accrediting body to evaluate the testing, including cases where no organized PT program is available.

The final two talks discussed how certain laboratory testing methods were applied to different companies. Each provided information about each of the specific testing methods used in the company's laboratories and how these methods led to improved reliability in data and data collection. It was interesting to see how the four speakers differed in their methodologies and how each company viewed the ladder of importance for data collection.

The emphasis of this session was to discuss how quality control in laboratories was viewed in the United States and in the United Kingdom. While there was some variation in the different methodologies presented by each speaker, the general objectives were the same: provide clear, reliable practices that can be kept consistent throughout the duration of the study. Each speaker provided a good overview of ways to ensure laboratory reliability by use of different quality control measures.

TECHNICAL SESSION

T01 – Applied Laboratory Methods and Meat and Poultry

Avik Mukherjee, University of Minnesota,
and Yi Chen, Pennsylvania State University

This technical session emphasized the importance of improved detection techniques, better validation procedures for these emerging detection techniques, and effective intervention strategies in minimizing contamination of foodborne pathogens, such as *Salmonella*, *Escherichia coli* O157:H7, *Listeria monocytogenes*, and *Campylobacter*, in meat and poultry products. Significant improvement in sensitivity and specificity of *Salmonella* detection from beef samples by incorporating lytic bacteriophage specific to cross-reactive *Enterobacteriaceae* into the enrichment media was presented by James Stave. Further improvement and significant reduction in the number of transfers was achieved by using antibiotics in the enrichment media, as reported by Mark Muldoon. According to Julian Cox, a new chromogenic agar plating media, namely CHROMagar *Salmonella*, showed promising results in detection of this pathogen in chicken carcass rinses. Rob Davies evaluated the Oxoid Biochemical Identification System (OBIS), utilizing negative tests for certain enzymatic activities of *Salmonella*, and found it to be a potential rapid and accurate detection technique for this pathogen. Morgan Wallace presented his validation in favor of trim-to-media ratios of 1:9 and 1:4 and 10 h enrichment time for reliable detection of low levels of *E. coli* O157:H7 in beef trim samples. In his talk, Stan Bailey reported that the newly developed Tacra* enrichment broth significantly improved detection of *Campylobacter* spp. from chicken carcass rinses, compared to the traditionally used Bolton's enrichment broth. VIDAS *Listeria* DUO assay was reported to be effective in simultaneous detection of both *L. monocytogenes* and *Listeria* species in food and environmental samples. Vincent Atrache also emphasized that such simultaneous detection has the potential of providing better and more effective intervention strategy against *Listeria* contamination in food processing industries.

Heat treatments of foods are very effective, well-studied intervention strategies against contaminating microorganisms. Time Temperature Integrators (TTI) provide an inexpensive and convenient way of validating these heat treatments. Karin Mehauden talked about one such TTI, based on thermal properties of α -amylase from *Bacillus amyloliquefaciens*, and reported that this technique was very accurate in validating heat treatments that involved holding times between 2 to 8 minutes. Quantitative assessment of transfer of *L. monocytogenes* from conveyer belt to processed meat products such as deli ham slices was presented by Zhinong Yan, who inoculated conveyer belt surfaces. He reported that discarding the first 10 slices could be an effective strategy to avoid potentially contaminated slices ending up on consumers' plates. While lactate and diacetate have been effective against *L. monocytogenes* contamination in

cured ready-to-eat meat products, Kathleen Glass talked about effectiveness of antimycotic agents such as benzoate, sorbate and propionate in combination with nitrite in inhibiting listerial growth in ready-to-eat meat and poultry products. Brandon Carlson reported that hide decontamination treatments with potassium cyanate, sodium sulfide, and sodium hydroxide, along with a high-pressure hypo-chlorinated water-wash, might be effective intervention strategies against *E. coli* O157:H7 and *Salmonella* contamination in cattle hides.

T02 – Education and Dairy

**Karla M. Mendoza, Rutgers University,
and Michelle Danyluk, University of California–Davis**

Adrian Peters spoke about the barriers caused by the failure to recognize hazard, the failure to prioritize risks, insufficient education and the confusion of PRPS with HACCP, which in the UK inhibit the implementation of food safety management for smaller businesses. Valeria Netto spoke about understanding the implementation of enhanced food safety controls in the Ontario food processing sector. The results demonstrated that implementation is driven by market and incentives, and the barriers are related to business market uncertainty. Patricia Johnson discussed a study on staging the implementation of HACCP among small and medium-sized food processing establishments in Ontario, Canada. The HACCP Advantage GMP standards were developed to train staff in the elements of a written program; operational controls and environmental controls were considered to develop the program as well. Laura J. Bauermeister highlighted the importance of the development of Egg HACCP programs in the egg processing facilities. The results show that either small or large facilities had written SSOP's program or documented, and has no established corrective action. Ema Maldonado-Siman's lecture was about the level of adoption of quality management systems (QMS) into the Mexican pork industry. The main problem to establish HACCP in the pork industry comes directly from the production personnel, because of educational problems, low pay, lack of training and turnover of personnel. Karin A.K. Rosberg talked about the Good Agricultural Practices Network for education and training (GAPs NET), designed to reduce the microbial risk in fruits and vegetables by developing a comprehensive extension and an education program available in English and Spanish, and created for the benefit of growers, farm workers, children, scientists, and state and federal government personnel. Andrew Hall began the second half of the technical session by discussing the microbial population dynamics in hot drink vending machines and vended hot chocolate, and stated that a simple cleaning protocol can control the level of organisms within vended hot drinks, although the process of vending increased the microbial load in the drinks. The thermal inactivation of *Bacillus anthracis*

spores in milk and their similarity to other spores was then discussed by Sa Xu. Vickie Lewandowski continued with an assessment of the microbial food safety of cream cheese, and determined that when stored properly, cream cheese did not support the growth of vegetative pathogens or *Clostridium botulinum*. The survival and growth of foodborne microorganisms, including both pathogens and spoilage organisms (bacteria and molds), in processed and individually wrapped cheese slices was addressed by Nigel Harper, who found that both pathogenic and spoilage bacteria were unable to grow in this product, although long-term storage led to growth of molds. Finally, Robert Gravani discussed the use of photo novels in farm worker education and training, and the positive feedback received to date.

T03 – Pathogens and Antimicrobials

**Hudaa Neetoo, University of Delaware, and
Michelle Danyluk, University of California–Davis**

Dr. Friedman opened the session with his presentation on the antimicrobial activities of plant compounds, including oregano oreganum, oregano Spanish, thyme plant essential oil, and their active constituents carvacrol and thymol, against *Escherichia coli* O157: H7 and *Salmonella* Hadar in tomato and vegetable juices and in a Tomato/Pectin edible film formulation. He demonstrated that the pathogens showed similar susceptibilities to the antimicrobials in the tomato/pectin formulation and in the tomato juices. Dr. P. Muthukumarasamy investigated the effect of adding probiotic *Lactobacillus reuteri* as a co-culture with the meat starter cultures on the viability of *E. coli* O157:H7 in dry fermented sausages in planktonic or microencapsulated forms. Planktonic *Lactobacillus reuteri* was effective in reducing *E. coli* O157:H7 by 3.0 log CFU/g, but microencapsulated *Lactobacillus reuteri* showed little activity against the foodborne pathogen. Wendy Maduff described the use of a new primer set optimized for real-time PCR for improved detection of *E. coli* O157:H7 from environmental samples. Overall, she was able to show that these primers offered greater specificity and sensitivity in environmental testing across multiple amplification and detection platforms. Mindi Russell investigated the multi-drug resistance profiles of generic *Escherichia coli* cultures obtained from commercial and organic bovine feedlot lagoon waters. Twenty-one food animal antimicrobial-resistance profiles of the *E. coli* isolates were determined. In conclusion, she demonstrated that more multi-drug resistant generic *E. coli* cultures were present in commercial feedlot lagoon water (31% vs. 25%) compared with organic feedlots. Yesim Soyer investigated the genetic relationships of 167 and 185 clinical *Salmonella* isolates from cattle and humans, respectively, by serotyping and pulsed-field gel electrophoresis (PFGE). Her findings demonstrated small temporal and geographical case clusters among the human isolates. She also showed the endemicity of certain cattle isolates

to particular farms and the existence of geographical clusters of *Salmonella* subtypes. Anita Wright described the population genetics of virulence potential in environmental reservoirs of *Vibrio vulnificus*, and the differences between environmental (oyster) and clinical strains. Julian Cox then discussed the biodiversity of *Bacillus cereus* associated with cooked and raw rice, with raw rice showing a greater range of organisms while *B. cereus* (80% enterotoxin positive) is the dominant species in cooked rice. The destruction of bacterial pathogens in non-heated acidified vegetable products was addressed by Fred Breidt, who determined that reductions of *E. coli* O157:H7 were dependent on temperature. David Brookes examined the role of biofilm growth in *Campylobacter jejuni* oxidative stress response and found no significant difference in oxidative gene expression between planktonic cells and biofilms. The effect of chitosans and chitooligosaccharides upon the growth of microorganisms in foods was evaluated by Joao Fernandes, who discovered a broad spectrum of anti-microbial activity for the compounds tested against a wide range of microorganisms. Avik Mukherjee ended the session by discussing the effects of seasonality on the prevalence of pre-harvest *E. coli* on fresh fruits and vegetables in the Midwestern US, where the greatest risks exist in early summer.

T04 – Risk Assessment and Epidemiology

Lorraine McIntyre, University of Hertfordshire

Angela Valadez and Wilmette Crawford described a computer simulation program that allows participants to experience a food defense crisis in which outcomes are dependent on decisions made. In this program, absence of identification and control of the unknown chemical agent may cause up to 13 million illnesses costing ~\$4 billion (worst case scenario). James Trout presented results of research on the prevalence of zoonotic *Giardia* and *Cryptosporidium* in farms in 7 states to assess human risk of disease from manure. *Giardia* prevalence was highest in 2 to 11-month old calves; the highest levels of *Cryptosporidium* were found in 1 to 8 week old calves.

Heejeong Latimer discussed a generic risk assessment model for *Salmonella* in poultry. The model options include choices in the categories of production, storage and transport, preparation and dose response and *Salmonella* serotype. This model assesses plants into 3 risk categories. Thomas Oscar described a predictive model for growth of *Salmonella* Typhimurium DT104 in ground chicken breasts. One-g portions of ground chicken were inoculated with the organism, and growth at 10 to 40°C was assessed by MPN or direct plate counts. A stochastic model with > 90% concordance and valid data prediction was created to allow the user to predict growth on a spreadsheet. Lorraine McIntyre described an outbreak of *Salmonella* Thompson involving the handling of pet treats. Nine illnesses were traced to Alberta, BC and to Washington state by use of PulseNet (PFGE analysis), and multiple *Salmonella* serotypes were found in the pet treats.

Emma Harnett described a risk assessment model for *Enterobacter sakazakii* designed for use by managers assessing the risk of powdered infant formula (PIF). Eight scenarios modeled the preparation and handling of PIF in 4 steps (rehydration, cooling/holding, rewarming and feeding) at two temperatures. This will allow the development of a FAO/WHO guideline intended for dissemination as a web-based program. Greg Paoli discussed risk-based calculations to examine lot rejection rates for PIFs. Simulations measuring risk reductions showed sampling analysis differences in between-lot variability vs. within-lot variability and resulting values.

Micha Peleg gave an entertaining discussion on why the Fermi solution works as a tool to estimate the number of victims of food poisoning (and also works to estimate the number of piano tuners in Chicago!). The probability is low that in a series of guesses one will consistently err on one side (high or low). The central limit theorem allows the identification of a range of how many persons are ill by the use of guesses based on limited knowledge of the number of people exposed to a food type, food preparation, and/or pathogen. Mark Powell discussed problems associated with detection of BSE in low prevalence countries. Detecting a statistically significant difference is difficult when there are fewer than 2.5 cases per 10,000, and hypothetical variability inflates the uncertainty. The standard EU BsurVE Model is found at <http://www.bsurve.com/>. Roy Betts described a food safety database containing records of micro, chemical and physical outbreaks developed from information sources in the UK. With 7,650 records entered, queries on types of microbes, food types, and food chain issues can be examined to seek possible corrective actions. Norashikin Aziz described a bench-scale cleaning rig that can measure tomato fouling for clean-in-place instruments. Polytetrafluoroethylene (NI-P_PTFE) coatings on equipment, higher temperature, flow rate and NaOH concentrations can all work to reduce cleaning times.

T05 – Education

Paula Martins de Freitas, University of California–Davis, and Raquel Lenati, University of Ottawa

Mary Roseman (University of Kentucky) and Kofi Adu-Nyako (North Carolina Agricultural and Technical State University) used the health belief model to analyze food safety behaviors. Results suggested that age, education, ethnicity and gender of the population influenced food preparation. Educational strategies targeting specific socio-economic groups are most likely to succeed.

Margaret Binkley (Texas Tech University) organized a study (4,788 surveys in 8 states) examining the impact of foodservice managers credentialing and health inspection knowledge. Certification programs and training methods impact the level of food safety knowledge of the foodservice manager. Also, certified managers were more

knowledgeable in food safety practices. However, this knowledge did not always transfer to better health inspection scores, showing that certifying foodservice managers is not enough to keep food safe.

Rita Brennan Olson and Elena Carbone (Massachusetts Department of Education) presented "examined the exam," given after food safety training. They produced a booklet with the goals of successfully communicating the materials, called, "Taking a Closer Look, Food Safety Word List" (available at www.umassoutreachbookstore.com), after determining that participants had difficulties with languages and comprehension of exams.

Brae Surgeoner (University of Guelph) reported a Norovirus outbreak that occurred at her university, January/February 2006. All 155 patients were university students from a single residence. Housekeeping and food services staff were interviewed to determine how knowledge of the Norovirus infection, and the outbreak itself, affected the personal hygiene of the population involved.

David Lloyd (University of Wales Institute, Cardiff) presented an evaluation of inter-auditor reliability within an accredited food safety program to compare the auditor liability and consistency of non-conformance reported among auditors. Over 30 audits by 5 auditors were analyzed. 100% of permanently employed auditors awarded higher average numbers of non-conformance than sub-contracted auditors.

Denise Worsfold (University of Wales Institute, Cardiff) studied consumers' use of information on restaurant food safety by surveying households. Food hygiene can be a key determinant of restaurant choice, but cleanliness was estimated only by glasses, tablecloths and cutlery. Complaint type and action taken differs by age and gender.

Sheryl Cates (RTI International) reported a survey for the storage of refrigerated ready-to-eat foods. Most of the people surveyed, including pregnant women, did not know of *Listeria monocytogenes* problems. The majority didn't follow recommendation of storage for foods such as soft cheeses and bagged salads. Answers varied by race, education, age and other demographic factors.

Sarah Wilson (University of Guelph) described the www.foodservicenetwork.ca program in place for over 10 years, which answers questions on food safety from farm-to-fork. Data were collected over two years and analyzed.

Sandra McCurdy (University of Idaho) discussed music's ability to enhance a food safety class for high school students by use of song lyrics about food safety, from Dr. Carl Winters (foodsafety.ucdavis.edu/music.html#songsgeneral). Although no statistically significant differences were observed, the songs seemed to have positive results in the classroom.

Cornell University presented a bilingual coloring book for children ages 5–10 about the US produce industry, including themes about proper food preparation and hand washing. Children (10,000) in Ohio,

New York, Texas and California received books packaged with crayons, soap and washcloths. Ninety-six children completed written surveys, while a smaller group of younger students responded verbally. The project is part of a farm worker education program by the National GAPs to reduce microbial risks in produce through education and extension. www.gaps.cornell.edu.

Vanessa Kretzschmar-McCluskey (Auburn University) explained the challenges of promoting non-technical careers to a technological generation known as "generation Y". The study aimed to determine innovative ways to recruit students into Poultry Science by utilizing web-based tools. They found that this generation would be better recruited by computer based methods.

T06 – Pathogens and Antimicrobials—*Listeria*

Hudaa Neetoo, University of Delaware,
and Yi Chen, Penn State University

Catherine A. Simpson opened the session with a presentation on the effect of temperature and storage time on the fate of *Listeria monocytogenes* on inoculated salami. She demonstrated that pathogen levels decreased during storage and rates of reduction increased with storage temperature. Gianna Duran compared the antilisterial effects of low equal molar concentrations (0.083 M) of acetic, lactic and citric acids and their combination in bologna. She found that the acid treatments inhibited growth in increasing order as follows: citric>combination>lactic=acetic. Yohan Yoon discussed the use of developed models for the prediction of lactic acid concentration, dipping time, and storage temperature combinations in determining growth/no growth interface boundaries, preventing growth, or allowing selected levels of growth of *L. monocytogenes* in Ready-to-Eat (RTE) meat products. Buffy A. Stohs evaluated the effectiveness of sodium lactate as an antimicrobial dip when used prior to and after inoculation of *L. monocytogenes* in non-lactate formulated frankfurters. Camelia Grosulescu presented her findings on the effects and interactions of sodium lactate, sodium diacetate, and pediocin on the thermal inactivation of starved cells of *L. monocytogenes* on the surface of bologna. She found that temperature had the most significant effect on the inactivation of starved cells of *L. monocytogenes* on the surface of bologna and that the combination of temperature with all the antimicrobials had a significant effect on inactivating the starved cells. Scott Burnett investigated the anti-listerial efficacy and organoleptic impact of an octanoic acid-based treatment for RTE meat and poultry products. His results demonstrated that octanoic acid can be used as an effective post-lethality treatment, meeting FSIS regulatory guidelines for RTE meat and poultry products with minimal impact on sensory quality. David Nyachuba presented his findings of the impact of nitrate on viability and detection/recovery of *L. monocytogenes* in smoked salmon, smoked ham and bologna. He found that nitrate injury can cause false-

negative results in tests for detection of *L. monocytogenes* in Ready-to-Eat meat and seafood products at early sampling times and that *L. monocytogenes* can repair and grow to high levels over extended refrigerated storage periods. Greg Kepka investigated the interaction of *Pseudomonas putida* and *L. monocytogenes* in mixed culture biofilms and demonstrated that *L. monocytogenes* produced biofilms with greater biovolume and mean thickness in mixed culture than in monoculture. Yuwei Hu characterized the interaction between two stress response systems in *L. monocytogenes*, *ctsR* and *sigB*, by measuring heat tolerance, motility and host cell invasion; her findings suggested that interactions between the two systems are required for both stress response and virulence of *L. monocytogenes*. Kendra Nightingale, using *L. monocytogenes* as a model organism, developed and evaluated a novel two-step (SourceCluster and TreeStats) statistical approach to identify phylogenetic clades that are significantly associated with distinct sources. She found that this approach can identify significant same-source clades in phylogenetic trees and that *L. monocytogenes* includes both host- and environmentally-adapted clonal groups. Daniel Demarco improved the sensitivity of a *Listeria* genus PCR detection assay by using cell capture and concentration with a novel bacteriophage-derived cell binding domain and phage endolysin lysis.

T07 – Produce

**Michelle Danyluk, University of California–Davis,
and Yi Chen, Pennsylvania State University**

This technical session began with Bassam Annous sharing his group's results on the attachment of *E. coli* O157:H7 to the stem, calyx sepals, russet and discontinuities on the skin of golden delicious apples. They found that *E. coli* O157:H7 cells readily attached to the stem and were then difficult to remove. The attachment of cells to the surface of apple appeared to be due, in part, to hydrophobic interactions. Lindsey Arthur then evaluated the potential of compost tea, a brewed water extract made from compost materials, as a vehicle in the transfer of pathogens to produce. She demonstrated that

the age and type of compost and the brewing time and temperature impacted the microflora of the tea, with the time especially impacting the level of *E. coli*. She also recommended that compost tea be used only on crops that are not consumed raw. Larry Goodridge then discussed the use of high hydrostatic pressure as a method to reduce the level of *Salmonella* Enteritidis on the surface of raw almonds. High pressure treatment (HPP) at 60,000 PSI, followed by a drying step at 65°C, resulted in a log reduction of over 4 of *Salmonella* Enteritidis. The use of water as a pressurizing medium appears to be a means for HPP treatment of dry foods. Louise Fielding explained the effect of ozone and open air factor (OAF; derived from monocyclic monoterpene) against aerosolized and surface attached *Micrococcus luteus*. OAF was able to reduce population levels more effectively than ozone, and should continue to be studied as an effective terminal sanitizer. OAF also had lower risks to health than ozone or other gaseous treatments. Lisa Gorski monitored the growth of *Listeria monocytogenes* and a sigma B mutant in soil and on radishes grown in contaminated soil. *L. monocytogenes* was found to be able to survive in soil for up to four weeks and colonize mature radishes and could not easily be removed from the radish surface. Sigma B was important for both soil and radish colonization. However, when experiments were repeated with unautoclaved soil, results were very different. Paula Martins de Freitas continued with the evaluation of *Citrobacter youngae* as an environmental surrogate for enteric bacterial pathogens on produce, with primary emphasis on *Salmonella* on leaf surfaces, using parsley as a model system. The epiphytic behaviors of *Citrobacter youngae* were similar to all pathogens tested under some conditions, while more similar to *Salmonella* and were similar to *E. coli* under particular conditions; however, direct comparisons under specific model conditions continue to be essential prior to use of this organism. Misty Johnstone finished the technical session with a discussion of the persistence of indicator bacteria in agricultural soils following winter flooding events. The results suggested that presumptive indicators of fecal contamination decline following natural drying and pre-plant soil management, but that the risk associated with each flooding situation should be evaluated individually.

ROUNDTABLES

RT1 – Issues Regarding Raw Milk Sales and Consumption

Ben Chapman, University of Guelph, and Brae Surgeoner, University of Guelph

This component of IAFP's Annual Meeting was the first round table discussion. The focus was on presenting the topic of raw milk consumption and sales from various points of view, with the hope of arriving at a better understanding of interests surrounding the issue. Allen Saylor began the session with a historical background of raw milk, discussing the potential for pathogens and the raw milk movement of the 1960s. He also focused on claims and potential myths, including the impacts of raw milk on asthma, the presence of human pathogens, and pasteurization's effects on vitamins and enzymes. Claudia Coles of the Washington State Department of Agriculture discussed raw milk regulations in her state, beginning in 1949 and up to a recent push to make raw milk illegal. Claudia also mentioned recent outbreaks associated with raw milk and raw milk products, and discussed the perception of regulation loopholes that may have led to them. These included the selling of raw milk under the guise of pet food and the increase of cow sharing operations. Rejean Bouchard of the Dairy Farmers of Canada discussed raw milk sales. He provided a historical overview of Canadian raw milk laws and made it clear that sales of raw milk are illegal across Canada and can lead to fines of up to \$250,000. Quebec is the only province that allows for raw milk cheese production. Tim Whiteman, a dairy farmer and consultant for the Weston A. Price Foundation, provided a case study on how raw milk is sold legally in the US. He suggested that in the absence of legally available raw milk products, consumers who want them will purchase them illegally. He suggested that there is little money provided for raw milk research, and said that good science could be used to support the extreme viewpoints of regulators and proponents. Caroline Smith-DeWaal of the Center for Science in the Public Interest (CSPI) presented an overview of consumer protection laws and outbreak statistics. She stated that 28 states currently allow the sale of raw milk and that some recent changes are due to consumers' choices being made on the basis of many factors, including health, concern for the environment, and welfare. CSPI does not currently support the consumption of raw milk, and she stated that the industry would have to improve practices for their stance to change. Bill Marler of Marler-Clark LLP PS discussed the legal implications of selling raw milk. He explained that if a product is injurious, the manufacturer of the product is liable. He suggested that contaminated milk is an unreasonably dangerous product, and a lawyer's focus in an outbreak-related case is to prove that the product made a consumer ill. He suggested that if there is historical

knowledge about a problem with a process, a lawyer will use that information in a case to show that the risk could reasonably be managed by the manufacturer. He also discussed comparative liability (where fault is shared) and trade association liability (an association can be held reliable if consumers rely on the information provided by the association). The round table panel responded to questions from the audience, including the liability of parents if a child becomes ill, consumer education packages, and the specifics of raw milk testing.

RT2 – Refrigerated Ready-to-Eat Foods: Microbiological Concerns and Control Measures

Olekasndr Byelashov, Colorado State University, and Hudaa Neetoo, University of Delaware

Ready-to-eat (RTE) foods often get implicated in cases of foodborne disease because the foods support the growth of pathogenic bacteria, and are often consumed without cooking or reheating, and because the pathogens involved have the ability to multiply at refrigeration temperature. This round-table session addressed the problems of contamination of RTE foods with *Listeria monocytogenes* and new establishment procedures to further reduce the incidence of this foodborne pathogen, concerns about contamination with other pathogens such as non-proteolytic strains of *Clostridium botulinum*, particularly in vacuum-packed RTE foods, and the ineffectiveness of warning labels and limited shelf life as measures to ensure the safety of RTE foods.

Dr. Emilio Esteban (USDA-FSIS) discussed the need for establishments to take more meaningful steps to reduce the incidence of *Listeria monocytogenes* by incorporating one of three strategies (Post-lethal treatment + inhibitor, Post-lethal treatment or inhibitor, sanitation) to control this pathogen. He also emphasized the need for verification of these actions through testing and sharing the results with FSIS in order for the agency to design a more risk-based verification-testing program.

Dr. Jenny Scott (Food Products Association) discussed the problem of non-proteolytic *C. botulinum* in vacuum sealed RTE foods. She expressed concern about lack of data to assess the risk of Group II strains in refrigerated foods. She also recommended the use of additional hurdles and shorter refrigerated shelf lives, and emphasized the need to conduct challenge tests as part of the measures to reduce the risks associated with Group II strains of *C. botulinum*.

Dr. George Evancho (Campbell Soup Company) discussed the ineffectiveness of warning labels and limited shelf-life rules in ensuring the safety of RTE foods. He explained that there are no existing restrictions or penalties in place for those who do not read the warnings or follow the directions. Dr. Evancho also explained that shelf life of foods is related to storage temperature and that temperature abuse often exists at retail or in the home. He therefore concluded that warning labels and limited shelf lives should not be used as tools to alter consumer behavior.

During the round table discussion, it was mentioned that United States government agencies currently do not regulate microbiological sampling plans. The use of mathematical modeling in the plans was discussed, as was the obvious need for research on non-proteolytic *C. botulinum*. Among other issues was the nature of temperature and time abuse of RTE food, which is thought to be complicated because the safety of the food depends on many factors, such as the microorganism involved, physical and chemical properties of the food, and the status of the immune system of the consumer. Another topic discussed was the most effective means of educating consumers, ending with the suggestion that education of consumers should be done at all levels, starting at a very young age. Other concerns raised included the need to regulate the shelf life of food products at refrigeration temperature in restaurants.

RT3 – Water Safety and Quality Roundtable: Global Water – HACCP Issues

**Raquel Lenati, University of Ottawa,
and Arpan R. Bhagat, Purdue University**

Humberto Maldonado from Driscoll's, Mexico, reported on the importance of water safety for agriculture. He presented examples describing cases and frequency of *Giardia* and *Cryptosporidium* cysts, *Salmonella* and *E. coli* contamination in Mexican agricultural goods. In the majority of cases, contamination is due to the use of water from contaminated ground water and unprotected irrigation canals. It was explained that re-used water is applied for irrigation and that this type of water must comply with the Mexican regulation (NOM_001_SEMARNA-1996). Further, he mentioned that 20% of the world's agricultural produce is irrigated with waste water.

The national Canadian HACCP coordinator, Tom Graham, detailed the HACCP system in place for food industries in Canada. He mentioned the process controls considered by the regulatory agency and food industry when addressing the HACCP system for water, such as source of water and uses of water. Other hazards taken into consideration during the assessment of water include boilers, errors by plant personnel, faulty backflow preventers and potential carryovers. Tom provided an

insight into farm food safety programs, quality management programs, and food safety enhancement programs. He also discussed the potential hazards and the scientifically validated hazard identification and analysis that form the basis of the Food Safety Enhancement Program (FSEP)-HACCP requirements.

Adrian Peters, U.K., explained how quality water for consumption in the U.K. complies with the European Union regulation 98/83EC, which includes water used as an ingredient in the food industry. This regulation defines quality water as "wholesome and clean." The water from the consumers' taps must conform to 26 chemical and 2 microbiological parameters. Water used in the food industry, for cleaning and as a process aid, complies with the regulatory HACCP (EC852/2004). He also briefed on the HACCP water control strategies and the role of the British Retail Consortium (BRC) in ensuring water quality. Impressively, according to a 2005 survey, 99.96% of the results of British water tests were within the parameters.

Peter Hibbard, from the Quality Seafood Inspection team of Darden Restaurants, explained the political, cultural and economical hurdles encountered with regard to the water used for aquaculture in the Asia/Pacific area. Working together with the Global Aquaculture Alliance, a HACCP program targeting source water is being developed. The Best Aquaculture Practices involves the use of filters; treatments such as UV, ozone or chlorine; and yearly testing. Hibbard's team also works with the Aquaculture Certification Council, which offers guidelines to assist the industry to comply with Canadian, European and American regulations.

Finally, Rita Schoeny presented Environmental Protection Agency's (EPA) requirements for water safety. Schoeny clarified that each state designates the proper use of water bodies within its area. Acts regulated by EPA concern only human health (under the Safe Drinking Water Act). EPA has the water obligation under the clean water act and food quality protection act, as well as obligation for the water to the point it gets into the house plumbing, but not for tanks with less than 15 connections or less than 25 users. EPA does not formally use HACCP, but the principles of HACCP are followed.

Following the presentations, Larry Cohen from Kraft Foods and Peter Kennedy from Quality Flow led an interesting discussion regarding the regulations and standards in place for drinking and ingredient water worldwide.

Highlights of the Executive Board Meeting

August 11–17, 2006
Calgary, Alberta, Canada

The following is an unofficial summary of actions from the Executive Board Meeting held at the Hyatt Regency Calgary over the dates of August 11–17, 2006.

Approved the Following:

- Minutes of April 24–25, 2006 Executive Board Meeting
- Privacy Policy for Member Information

Discussed the Following:

- E-mail votes Taken Since the Last Meeting
- Committee Appointments to Begin at IAFP 2006
- Revision of the Procedures to Investigate Foodborne Illness
- Paper on Food Worker Hygiene
- Proposed Changes to the Constitution and Bylaws
- Nominating Committee – Candidate Guidelines
- Applied Laboratory Methods Workshop Proposal
- IAFP 2006 Board Schedule
- Board Committee Meeting Assignments
- Board Exhibitor Assignments
- Committee Recommendations
- Awards Banquet Review
- Ivan Parkin and John Silliker Lecturers
- Review of IAFP 2006
- Foundation DVD Project and Review of Focus Breakfast
- Rapid Response Series
- University Speaker Program
- Student Travel Scholarship Award Program
- Member Dues Restructure Plan – Implement by January 1, 2007
- Affiliate Activity
- Possible New Affiliate Groups
- Non-compliant Affiliates
- Affiliate Reception
- 3-A Sanitary Standards, Inc.
- European Symposium for Fall of 2006
- Exhibit Opportunities for 2006–2007
- Retail Foodservice Conference
- Allergy Icon Development
- WHO–NGO Progress
- Presidential Lifetime Achievement Award Criteria Revision
- Food Safety Summit-China – IAFP's Participation
- Retail Foodservice Conference – IAFP's Participation
- Society for Applied Microbiology
- Ivan Parkin Lecturer for 2007
- *JFP* Articles on a Stick (memory stick)

Reports Received:

- *Food Protection Trends*
- *Journal of Food Protection*
- IAFP Web Site
- Membership
- Financial Statements–June 2006
- Board Members Attending Affiliate Meetings
- Affiliate Newsletter
- Future Annual Meeting Schedule
- Exhibiting (IAFP On the Road)

Next Executive Board meeting:
November 9, 2006

Minutes of the International Association for Food Protection 93rd Annual Business Meeting

August 15, 2006
Calgary, Alberta, Canada

President-Elect Frank Yiannas welcomed attendees and introduced President Jeffrey Farber.

Moment of Silence

President Jeffrey Farber 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 Telus Convention Centre in Calgary, Alberta, Canada. A quorum was present as defined by the IAFP Constitution.

With the approval of the Executive Board, President Farber appointed Michael Brodsky as Parliamentarian for the Business Meeting.

Minutes

Minutes from the IAFP 92nd Annual Business Meeting that were published in the November 2005 *Food Protection Trends* were approved with one correction to the *JFP* Management Committee Report in which a 94% increase in manuscript submissions was changed to 2%.

President's Report

President Jeffrey Farber reported on programs and activities of IAFP over the past year. He reported that Membership is stable at 3,000 Members, there has been an increase in Gold and Silver Sustaining Members, the journals are in good shape and there were no new Affiliates to receive charters this year although representatives are working on establishing new Affiliates in Norway, Japan and Spain.

President Farber noted that the Annual Meeting was off to a good start with more than 1,700 in attendance, all 130 Exhibit Hall booths were sold, lunch was provided on Monday and Tuesday in the Exhibit Hall, sponsorship revenue has increased steadily, a Foundation DVD was developed to grow the Foundation, students are still actively involved,

the number of Student Scholarships will increase for next year from 4 to 5 scholarships, and the second European Symposium will take place in late November in Barcelona, Spain.

Upon conclusion of his report, President Farber presented Presidential Recognition Awards to Maria Teresa Destro who has been very active in various Committees, with the *Journal of Food Protection*, and will begin a term with the Executive Board serving as Affiliate Council Chairperson; and Leon Gorris who has been very active with Committees and PDGs and was instrumental in organizing both European Symposia.

Tellers Committee Report

Michael Brodsky, Teller, reported there were 737 valid votes received. Vickie Lewandowski was elected as Secretary for the 2006–2007 year. A motion by Paul Hall and seconded by Michael Roberson to accept the report and destroy the ballots was approved.

JFP Management Committee Report

Chairperson Maria Teresa Destro reported that the new *JFP* Online Review System is in place with 100% of submissions being done online. She also reported this year's volume is ahead of last year for number of papers published and 53% of papers published last year were from non-US authors.

FPT Management Committee Report

Chairperson David Golden reported that Jinru Chen has replaced Beth Johnson as Vice Chair due to Beth's mid-year resignation because of her retirement. He reported there has been a decrease in manuscript submissions, the Committee plans to survey the readership to determine the types of papers desired, the Committee suggests that the Career Services section be discontinued, a statement will be added to the instructions for authors that *FPT* is not an indexed journal, and they would like to publish PDG news, white papers, etc.

Foundation Fund Report

Gale Prince, Chairperson, reported that the Foundation was \$86,000 in 1980 – it is now \$347,000. He offered a reminder to make bids at the Silent Auction because all funds go to the Foundation. He reported there would be a \$3,000 matching contribution made by him and Beth Johnson as well as a \$500 matching contribution made in memory of Elmer Marth. Upon conclusion of his report, the Florida Association for Food Protection (FAFP) asked to be recognized and then offered an entertaining presentation, which concluded with a contribution to the Foundation of \$1,000. Gale thanked FAFP for their creativity and their contribution.

Affiliate Council Report

Chairperson Terry Peters reported there were 25 Affiliates represented at the Sunday Affiliate Council meeting and 5 guests in attendance. Affiliates reported on activities carried out during the year and elected Carl Custer, from Capital Area Food Protection Association, as the new Affiliate Council Secretary. The Council discussed the creation of a slide show of the IAFP Annual Meeting to be used at Affiliate meetings. Terry noted that, due to alphabetizing, the two California Affiliates will be shown as California and California, Southern. He also reported that the Affiliate Reception did not happen this year but will combine with the Welcome Reception for next year. The Committee discussed two awards that have overlapping criteria and referred these awards to the Awards Committee to develop more specific criteria.

The Committee recommended to the Executive Board that (1) there be more visibility for pre-Annual Meeting functions and (2) a slide show be developed of the Annual Meeting to show to Affiliates.

Maria Teresa Destro, from Brazil, received the gavel as incoming Affiliate Council Chairperson and will serve on the Executive Board this year.

Executive Director's Report

David Tharp reported this was an active and productive year. The Association has made strides in terms of its European involvement and, in the future, will plan to hold a symposium every other year in Europe with alternate years sponsoring a symposium in another country.

David reported on the financial condition of the Association and stated that as of August 31, 2005, the Association's General Fund held a balance of just over \$500,000. The results presented showed the best financial year ever for IAFP. David stated the financial goal for IAFP is to hold one-half of its annual budget (currently \$2.25 million) in the General Fund. He reported this year's financial outlook is promising, but final results will not be known until all invoices for IAFP 2006 are received and paid. The financial audit for year ending August 31, 2006 will be presented to the Executive Board at their November Board meeting.

David thanked the IAFP staff for their long hours and sacrifices made to enable IAFP 2006 to take place. He also thanked the Local Arrangements Committee and co-chairs Lynn McMullen and Gary Gensler from the Alberta Association for Food Protection for their help with IAFP 2006. In ending his report, he thanked IAFP Members and the Executive Board for the support they provide to him and the IAFP staff.

Unfinished Business

There was no unfinished business.

New Business

President Jeffrey Farber presented changes to two sections of the Constitution and six sections of the Bylaws as published in the May 2006 issue of *Food Protection Trends*. The changes relate to two issues: 1. Due to a decrease in Secretary votes received, changes allowing electronic balloting were requested, 2. Due to the dues restructure scheduled for 2007, changes relating to publication of an electronic newsletter as a benefit of the new base membership were requested.

President Farber asked that two motions be made. The first motion, to approve proposed changes 1 and 2 to the Constitution as published, made by David Fry and seconded by Don Schaffner was passed. The second, to approve the six proposed changes to the Bylaws, was made by Gale Prince, seconded by John Cervený, and was passed.

Adjournment

President Farber adjourned the meeting at 1:04 p.m.

Respectively Submitted,
Stan Bailey, Secretary

Committee Minutes

STANDING COMMITTEES

Food Protection Trends Management Committee

Members Present: Peter Bodnaruk, Jinru Chen, Julian Cox, Judy Greig, Leon Gorris, David Golden, Alex von Holy, Hussein Hussein, Mariza Landgraf, Charles Otto, Maria Nazarowec-White, Maria Teresa Destro, Michael Roberson, Tony Valenzuela, and Edmund Zottola.

Members Absent: Lance Bolton, Mindy Brashears, LeeAnne Jackson, Joseph Meyer, Franco Pagotto, Carol Selman, and Richard Whiting.

Board and Staff Members: Jeffrey Farber, Kathleen Glass, Frank Yiannas, Gary Acuff, Stan Bailey, David Tharp, Lisa Hovey, and Donna Bahun.

Meeting Called to Order: 2:04 p.m.

Recording Secretary of Minutes: Jinru Chen.

Old Business: David Golden thanked Donna Bahun for her hard work and dedication to *FPT*, welcomed new Committee Members and thanked departing members, especially former Vice Chairperson of the Committee, Beth Johnson. Introduction of Jinru Chen as Committee Vice Chairperson. No additions or modifications to the agenda were offered. The minutes from the 2005 meeting were accepted without change. Jeffrey Farber, IAFP President, gave a brief report on the highlights of the association. David Tharp, IAFP Executive Director, reported that the association is in much better financial shape this year. He also noted that continued increases in funding are needed, over the next few years, to raise the reserve fund to 50% of the annual operating budget. Ed Zottola, the Scientific Editor of *FPT*, indicated that the fact that *FPT* is not indexed may have prevented authors from submitting their manuscripts to the journal.

Donna Bahun, *FPT* Production Editor, reported that the submission rate decreased from the previous year. The Board Responses to the Committee's 2005 recommendations were reviewed. Donna Bahun reported the new "Thoughts on Food Safety" column, managed by Doug Powell, is now published quarterly.

New Business: The Committee believes that the inability to have *FPT* indexed is a major contributing factor to the decrease in submission rate. The readers should decide what types of articles they want to read and whether they want to cite articles that are not indexed. Much discuss-

ion was devoted to the future direction of *FPT* with regard to the types of articles and/or other information published in the journal. It was decided that a survey of the readership is necessary to assess the needs and interests of the readership.

Recommendations to Executive Board:

1. To conduct a survey to determine the type and content of articles that readers wish to see in *FPT*. The survey should indicate that *FPT* is not an indexed journal.
2. To discontinue the career services section (i.e., job opportunities) because of the new "Career Services" section now available on the IAFP Web site. The loss in revenue to IAFP would be negligible.
3. To add a statement to the *FPT* "Instructions to Authors" to indicate that *FPT* is not an indexed journal.
4. To add a section on "PDG News" to *FPT*, with solicitation of PDGs to submit news, information, white papers, etc. for publication in *FPT*. Julian Cox agreed to spearhead this effort, if approved.

Next Meeting Date: Sunday, July 8 at IAFP 2007.

Meeting Adjourned: 3:20 p.m.

Chairperson: David Golden.

Journal of Food Protection Management Committee

Members Present: Maria Teresa Destro (Chairperson), Morris Potter (Vice Chairperson), Kathryn Boor, Scott Burnett, Larry Cohen, Roger Cook, Judy Fraser-Heaps, Pina Fratamico, Judy Greig, Loralyn Ledenbach, Payton Pruett, and Scientific Editors: Michael Davidson, Joseph Frank, Elliott Ryser, and John Sofos.

Members Absent: David Acheson, Scott Burnett, Carl Custer, Faye Feldstein, Lone Gram, Eric Johnson, Kathleen O'Donnell, Laurentina Pedrosa, and Purnendu Vasavada.

Visitors Present: Larry Beuchat and Don Schaffner.

Board Members and IAFP Staff Present: Jeffrey Farber, Frank Yiannas, Gary Acuff, Stan Bailey, Kathleen Glass, Vickie Lewandowski, David Tharp, Lisa Hovey, Tamara Ford, and Didi Loynachan.

Members Leaving the Committee: David Acheson, Roger Cook, Lone Gram, Judy Fraser-Heaps, and Payton Pruett.

Meeting Called to Order: 10:08 a.m. by Chairperson Maria Teresa Destro.

Introductions: Those present were greeted by the Chairperson and introduced themselves. New members were welcomed and departing members were thanked.

Recording Secretary of the Minutes: Morris Potter.

Additions/modifications to Agenda and Approval: After discussion of an issue to be discussed as new business, the agenda was approved (Ledenbach/Cook).

Minutes of the 2005 Committee Meeting: The minutes were discussed and approved (Cook/Fratamico).

Report from the IAFP President, Jeffrey Farber: The IAFP President discussed progress and activities from the past year. Membership is stable at approximately 3,000, the number of Gold Sustaining Members has doubled to 8 in the past year, and there are 10 Silver Sustaining Members. No new international affiliates were created during this year, but Nordic countries, Japan, Australia, and Spain all are making progress toward affiliate status. The Foundation Committee has created a promotional DVD and has increased the Foundation to approximately \$350,000. The student PDG and other student/young scientist activities of IAFP are growing.

Report from the IAFP Office: David Tharp provided an update of activities in the past year. The general fund is approximately \$500,000, and the annual operating budget is approximately \$2,500,000. Lunches and receptions at this year's Annual Meeting are being held in the Exhibit Hall to increase contact time with exhibits and posters. The Committee Chairperson thanked Jeffrey and David for their presentations to the Committee and their leadership on issues important to journal health.

Report from the Scientific Co-Editors: Michael Davidson, Joseph Frank, John Sofos, and Elliot Ryser reported that volume 68 of the *Journal of Food Protection* (2005) contained 2,768 pages and 393 reports, including 372 research papers and 21 review and general interest papers. This compares to volume 67 (2004), which contained 2,908 pages and 423 reports (395 research and 28 review papers). Researchers from countries other than the United States authored 53.4% of the reports in volume 68, up from 43.5% the year before. In 2005, the Editorial Board was expanded from 140 to 147 members, and includes 35 scientists from countries other than the United States. So far in 2006, volume 69 is running ahead of volume 68 in numbers of pages and number of reports published. They highlighted that the number of submitted manuscripts did not increase for the first time in 9 years. The co-editors thanked the IAFP Board for its support for the AllenTrack online submission and review system, and for instituting a reception for the Editorial Board. The Committee Chairperson thanked the co-editors for their hard work.

Report from the Administrative Editor: Tamara Ford reported that 100% of manuscripts are now submitted online, using the AllenTrack system. She and the co-editors thanked Didi Loynachan for helping authors and reviewers understand the online system and ensuring the smooth and efficient operation of *JFP*. Tamara announced that online publication of *JFP* back through 1994 was underway. She reported that *JFP* ranks 12th out of 10,000 scientific journals for number of times the tables of content are viewed, according to IngentaConnect, 19th for the number of abstracts reviewed, and 13th for the number of homepage hits. As of August 1, 2006, *JFP* had 1,592 member subscribers and 795 institutional subscribers for the print version, and 993 member and 130 institutional subscribers for the online version. According to Journal Citation Report, *JFP* ranks 4th out of 94 food science and technology journals with an impact factor of 2.154.

Unfinished Business from 2005: In the review of *JFP*'s transition to the AllenTrack system, the scientific co-editors and journal staff indicated that things were working smoothly. A satisfaction survey of authors and reviewers is planned, but those in the meeting indicated their approval of the online submission and review system. The backlog of accepted manuscripts is up slightly (from 2.04 issues to 2.21 issues) at present. This is felt to be a good buffer to ensure timely publication of issues. Tamara Ford indicated that *JFP* has two upcoming NACMCF supplements to be published in 2006.

New Business: Unanimous agreement was expressed for satisfaction with the decision to appoint Elliot Ryser as the 4th scientific co-editor of *JFP* and to extend the term of Joe Frank.

Considerable discussion occurred regarding the issue of cost of journal operations, especially expenses related to the paper version of *JFP*, and the potential for page charges to deter submissions, especially from new scientists and scientists in developing nations. The Committee decided to request that the IAFP Board appoint a subcommittee to develop a 5-year strategic plan for *JFP* to address these issues and develop a competitive advantage for *JFP* in the food science and technology journal marketplace (Bailey/Davidson). Possible parts of such a strategy that were discussed included Foundation support so page charges could be deferred for authors unable to pay, a fund within the Student PDG to pay page charges for new scientists, and the new fee structure to be introduced in January 2007 that may decrease the number of print subscriptions. A proposal also was submitted (Pruett/Greig) for Committee consideration to provide information on the submission webpage to explain what advantages and services the page charge provides to authors (unfinished business for 2007).

Donald Schaffner addressed the Committee to request that the journal consider some mechanism to encourage authors to submit growth, inactivation, and survival data to ComBase co-incident with publication of their manuscripts in *JFP*. After discussion, the Committee proposed that the IAFP Board consider adding statements to the acceptance letters to encourage the voluntary submission to ComBase of properly formatted data from appropriate manuscripts accepted for publication in *JFP* (Cook/Fraser-Heaps).

Roger Cook raised the issue that funding agencies/organizations often require scientists to submit their data (often in a format suitable for publication) for public access as soon as the supported research was completed. This raises copyright and prior publication issues for *JFP*. The discussion developed around distinctions between "previously published" as peer-reviewed data and unreviewed data in the public domain. The Committee decided that additional discussion and debate on the definition of "previously published" was in order to accommodate public access requirements from funders and new technologies (Cook/Beuchat), and left the issue as unfinished business for 2007.

Recommendations to the Executive Board:

1. To appoint a subcommittee to develop a strategic plan to provide a competitive advantage to *JFP* for growth in manuscripts and readership.
2. To provide information on the *JFP* Web page informing the advantages and services the page charge provides to the authors.
3. To encourage authors of accepted manuscripts related to survival, growth, and inactivation of spoilage and pathogenic microorganisms to submit their data to ComBase.

Next Meeting Date: Sunday, July 8 at IAFP 2007.

Meeting Adjourned: 12:00 p.m.

Chairperson: Maria Teresa Destro.

Program Committee

Members Present: Emilo Esteban, Pascal Delaquis, Linda Harris, Lee-Ann Jaykus, Alejandro Mazzotta, Susan McKnight, Indaue Mello-Hall, Joan Menke-Schaenzer, Randall Phebus, Donald Schaffner, Gloria Swick-Brown, and Don Zink.

Members Absent: None.

Board Members/Staff Present: Jeffrey Farber, Frank Yiannas, Gary Acuff, David Tharp, Lisa Hovey, and Tamara Ford.

Meeting Called to Order: 7:00 a.m.

Recording Secretary of Minutes: Emilo Esteban.

Summary of Activities and Actions Taken: Alejandro Castillo, Timothy Jackson, Faye Feldstein, Vickie Lewandowski and Ron Schmidt will be leaving the Committee at the conclusion of IAFP 2006. On behalf of the Program Committee, we want to thank them for their contributions during their term. Their efforts were, in part, responsible for the successful programs presented at the Annual Meetings, and we truly appreciate all their hard work and dedication.

Members who will join the Committee this year: Emilo Esteban, Alejandro Mazzotta, Joan Menke-Schaenzer, Randall Phebus and Donald Schaffner. Emilo Esteban will serve as Vice Chairperson for IAFP 2007 and will become Chairperson for IAFP 2008.

The Committee served as a forum for groups wishing to present symposia and workshop proposals for IAFP 2007. At the Wednesday committee meeting, 60 symposia and 8 workshop proposals were submitted. Further review of all symposia will be made during the Thursday meeting.

Chairperson: Lee-Ann Jaykus.

SPECIAL COMMITTEES

3-A Committee on Sanitary Procedures

Members Present: Ronald H. Schmidt, Philip S. Wolff, and Stephen Sims (advisor).

Members Absent: Sherry Roberts (Chair), Don Wilding (Vice Chair), Randy Elsberry, Thomas L. Ford, William E. Fredericks, Jr, Glenn A. Goldschmidt, T. Gary Newton, John A. Partridge, Stephen E. Pierson, Charles Price, John E. Ringsrud, Joel Stangelund, and Lynn A. Wilcott.

Guests Present: Ken Anderson, Tom Bell, Jean DeLisi, Dan Erickson, Dennis Gaalswyk, Allen Saylor, Wayne Sprung, and Molly Warren.

Board Members and Staff Members: None.

New Members: None.

Meeting Called to Order: 10:01 a.m.

As a quorum was not achieved, no formal business was conducted at the meeting. Thus, the meeting was an informal discussion, or brain-storming session about the role of CSP in IAFP, future needs, symposia, and educational programs.

Recording Secretary of Minutes: Ronald H. Schmidt.

Old Business: A report from 2006 3-A Meeting (Milwaukee, WI in May) was jointly presented by those who attended that meeting. A report from monthly CSP conference call meetings was generally presented by Wolff with considerable input from others.

New Business: Progress of 3A SSI. A report and update of 3A SSI was presented by 3A SSI Board of Directors (Schmidt and Saylor) with ample input from others involved (e.g. Anderson, Erickson, Delisi, Sims, Wolff).

It included a discussion of the progress of the Third Party Verification Program, educational efforts through workshops at the annual meeting and expansion of the 3-A Web site, and outreach efforts to food industries other than those currently served by 3-A Sanitary Standards and Accepted Practices (e.g., dairy, eggs, pharmaceuticals). As members of other industries were present, considerable discussion ensued among the members and guests present regarding the needs and expectations of these outreach efforts.

Committee Membership Issues. Membership in the committee was discussed, both from the perspective of 3-A as well as IAFP. Wolff agreed to research the criteria for membership in both committees.

Role of CSP. Finally, the role of CSP in IAFP, and how it can be enhanced was discussed. An important role of CSP is their involvement in the 3-A standards and practices writing process. However, there may be additional projects that the committee can undertake of more general interest to the IAFP membership.

Symposium for the 2006 IAFP Meeting. The symposium developed by CSP, with endorsement by the Dairy Quality and Safety PDG, was discussed. The symposium *S04 Verification of Sanitary Design of Food Equipment* will be held Monday, August 14, 2006 commencing at 8:30 a.m. This is the third symposium developed by the committee in the past three years, all of which have been accepted by the program committee. Those members and guests present were encouraged to attend and participate.

Symposium for the 2007 IAFP Meeting. Symposia topics for the 2007 IAFP meeting to be held in Orlando were discussed. After much deliberation, it was decided that Schmidt and Delisi develop a symposium proposal entitled *Sanitary Design: Challenges of the Food Transportation Industry* to be presented to the IAFP Program Committee.

Recommendations to Executive Board: While this was not a formal meeting, no formal recommendations are given. However, the committee asks for continued board support in all things great and small.

Next Meeting Dates: The CSP will meet via monthly conference calls, at the 2007 3A Sanitary Standards meeting in Milwaukee, WI, and on Sunday, July 8 at IAFP 2007.

Meeting Adjourned: 11:52 a.m.

Acting Chairperson: Ronald H. Schmidt.

Audiovisual Library Committee

Members Present: Judy Harrison, Tom McCaskey, and Warren Clark.

Board and Staff Members Present: Gary Acuff and Nancy Herselius.

Meeting Called to Order: 1:15 p.m.

Recording Secretary of Minutes: Judy Harrison.

Old Business:

Review of AV Library Services:

1. Three new acquisitions: Videos.
2. Several materials were purchased this year to replace tapes that were worn, etc.
3. Review and Approval of 2005 minutes.
4. Reviewed library usage report; to date in 2006, 568 requests with 545 being fulfilled. Final usage for 2005 was 823 requests with 812 fulfilled.

New Business:

1. Need for better descriptions of AV materials to be published in listing. Nancy needs the help of the committee in coming up with better descriptions for the materials in the AV Library. The committee decided to update the form that goes out to reviewers to include more specific information about what the resource is about, who the target audience would be, the scientific level of the video, how the material could be used, and a place for writing a better description of the new material.
2. Delinquency in returning materials checked out from the AV Library. Nancy mentioned that she has had some problems this year with members who do not return materials they check out in a timely manner. This is a problem because it prevents the material from being available to other members. The committee suggested implementing a "two strikes and you are out policy" so that if a person holds materials beyond the return date more than twice per year, then they lose their library privileges for a period of time.
3. Review of the budget. The budget is being increased by \$500. Nancy requested that committee members let her know of new materials that we should obtain for the library. During the year, an e-mail message was sent to the IFT Extension Division listserv by Judy Harrison requesting IFT members who might have new videos to let Nancy know. However, no responses were obtained. Judy will set up a distribution list for AV library committee members this year so that we can get more feedback from them on new resources.
4. Review of AV Library holdings. The committee feels that we need to examine the holdings in the library and begin to archive some of the older holdings to allow for more storage space of up-to-date and new materials. The committee members will take a closer look at the comments that are returned when people check out videos and make suggestions to Nancy about whether to keep a resource active or archive it. The committee voted to allow Nancy to archive any resource that has not been requested in three years. Nancy mentioned that she is finding that videos hold up much better than DVDs. The DVDs scratch easily and become unusable.

5. Long-term goals: The committee discussed the possibility of developing a short video to help promote IAFF to prospective members and to acquaint prospective members with the various committees and services that are available through the organization. This could be used at affiliate meetings, etc. Advertising in professional journals of other organizations was also discussed as a way to promote the AV Library and IAFF.

Recommendations to Executive Board:

1. Implementation of a "Two Strikes and You're Out" Policy for use of the AV library. If a member fails to return materials checked out in a timely manner twice in one year, their library privileges would be suspended for some period with Board approval.

Next Meeting Date: Sunday, July 8 at IAFF 2007.

Meeting Adjourned: 2:20 p.m.

Vice Chairperson: Judy Harrison (filling in for Bob Sanders).

Awards Committee

Meeting Attendees: Terry Peters, Stan Bailey, and Stephanie Olmsted.

Meeting Called to Order: 11:00 a.m.

Recording Secretary of Minutes: Terry Peters.

Old Business: None.

New Business: The Affiliate awards of Best Affiliate Educational Conference and Best Affiliate Annual Meeting need clearer criteria in order to better distinguish between the two awards. The Affiliate Council referred this matter to the Awards Committee to prepare modified wording for these two awards.

The following additions (underlined> and deletions (strikethrough) are proposed:

1. Best Affiliate Educational ~~Conference~~ Award. The International Association for Food Protection's Best Affiliate Educational ~~Conference~~ Award is given annually to the Affiliate contributing to the education of its members with a technical meeting(s), conference(s) and/or workshops on topics pertinent to the interests of its membership.
2. Best Affiliate Overall Annual Meeting Award. The International Association for Food Protection's Best Affiliate Overall Annual Meeting Award is given annually to the Affiliate hosting a comprehensive annual meeting covering a wide variety of issues and topics of interest to its membership.

These proposed changes are to be sent to the Affiliate Council delegates for approval.

Recommendations to Executive Board: None.

Next Meeting Date: Sunday, July 8 at IAFF 2007.

Meeting Adjourned: 11:30 a.m.

Chairperson: Terry Peters.

Committee on Control of Foodborne Illness

Members Present: Ewen Todd (Chairperson), Charles Bartleson (Vice Chairperson), Dean Cliver, Patricia Desmarchelier, Judy Greig, Christopher Griffin, Jack Guzewish, Marilyn Lee, and Agnes Tan.

New Members: Michael Roberson, Maria Nazarowec-White, Thilde Peterson, and Elizabeth Hillyer.

Visitors: Thomas Schwarz, Richard Sprenger, and Keith Lampel.

Board and Staff Present: Jeffrey Farber and Didi Loynachan.

Meeting Called to Order: 8:10 a.m. – 10 a.m., 12:00 noon – 1 p.m., 3:00 p.m. – 5:00 p.m.

Recording Secretary of Minutes: Charles Bartleson.

Old Business: Revision of the Procedures to Investigate Foodborne Disease Manual 5th Edition

- Incorporation of deliberate food worker contamination (bio-terrorism) information – separate addendum.
- Problems related to scanning (Optical Recognition Software) of existing manual.
- Updating references, laboratory methods, investigation forms
- Future major revision of manual

Progress report on infected food worker papers

- Suggest papers be published in *JFP* and drafts shared with the *JFP* editors
- Potential problem with size of papers
- Appropriate location for the database and frequency of revisions and access issues
- Appropriate presentation of line list/narratives of 816 food worker related outbreaks
- Output of 4–5 papers expected from this work

New Business:

Multiple symposia were discussed – development in process

1. Round table on the science behind the temperature control of potentially hazardous and high risk foods.
2. Critical issues on the investigation of outbreaks.

3. Interactive Outbreak Experience: What do you do when "it" happens to you? "The Mystery Incident" This session will be a unique exercise involving multiple agencies and perspectives and presenters representing all aspects of the investigation.
4. Norovirus and the food worker (linking with the virology/parasitic PDG).
5. Fruit and vegetable outbreaks (lettuce, tomato, basil) (linking with Fruit and Vegetable Quality and Safety PDG).

Recommendations to Executive Board:

1. The committee recommends that the five food worker papers be published in the *Journal of Food Protection*.
 - Description of the Problem, Methods and Agents Involved
 - Size, Severity and Settings
 - Description of Outbreak Categories
 - Transmission Mechanisms
 - Control Measures and Recommendations
2. The committee recommends
 - a. That the Procedures to Investigate Foodborne Illness manual be revised to include the bioterrorism component for publication by September 30, 2006 and further revisions of the manual will be done in 2007 for a final 6th edition to be completed by Sept. 30, 2007.
 - b. The committee recommends that the Procedures Manual be put into an electronic format for ease of editing in the future.
 - c. Funding for three day meeting (possibly D.C. area) in Jan. 2007 for four members to continue work on final two food worker papers and updating the Procedures Manual.

Next Meeting Date: Sunday, July 8 at IAFP 2007.

Meeting Adjourned: 5:00 p.m.

Chairperson: Ewen Todd.

Constitution and Bylaws Committee

Meeting Attendees: Michael H. Brodsky, Zeb E. Blanton, David D. Fry, and Steven C. Murphy.

Board Member Present: Vickie Lewandowski.

Meeting Called to Order: 11:14 a.m.

Recording Secretary of Minutes: Michael Brodsky.

Old Business: None.

New Business: Proposed changes to Constitution and Bylaws were discussed. Moved by Zeb Blanton, seconded by Steven Murphy to recommend adoption of changes to the Constitution and Bylaws as published in the May

2006 issue of *Food Protection Trends* and posted on the IAFP Web site. Passed unanimously.

Recommendations to Executive Board:

1. Recommended that Steven Murphy be appointed as Vice Chairperson for the Constitution and Bylaws Committee for 2007/2008 and chair for 2008/2009. Randy Daggs will be the Chair for 2006/2007.
2. Status of current committee members needs to be reviewed and additional appointments made as needed.

Next Meeting Date: Sunday, July 8 at IAFP 2007.

Meeting Adjourned: 11:30 a.m.

Chairperson: David Fry.

Foundation Committee

Members Present: Roger Cook, Bob Gravani, Fred Weber, Don Zink, Wilbur Feagan, Zeb Blanton, Peter Hibbard, Paul Hall, and Gale Prince.

Board Members and IAFP Staff Present: Jeffrey Farber, Frank Yiannas, Gary Acuff, Stan Bailey, David Tharp, and Lisa Hovey.

Meeting Called to Order: 3:10 p.m.

Recording Secretary of Minutes: Stan Bailey.

Old Business:

1. Approved the minutes of the July 10, 2006 conference call.
2. Reviewed the income and expenses of the Foundation.
3. Reviewed Foundation sponsored activities for 2006
 - a. Ivan Parkin Lecturer – Art Liang
 - b. Developing Scientist – 85 submissions and 10 semifinalists
 - c. Student Scholarships – 4 approved but one had travel problems
 - d. Silliker Lecturer – Bill Sperber
 - e. Lending Library – discussed possible streamlining to save costs and for better control
4. Established a subcommittee to address how IAFP could solicit funds from other foundations and grants. The subcommittee is to report back to the IAFP Foundation in six months.

Subcommittee to consist of Don Zink, Paul Hall, Gary Acuff with Fred Weber as the Chair.

New Business: The Foundation has established a breakfast of a group of industry to solicit input on how to get firms to contribute to the IAFP Foundation. This to develop a marketing plan for 2007.

Established a follow up committee conference call in about 30 days at 4 p.m. to discuss the information gained from the industry breakfast meeting. Date to be determined at a later date.

Recommendations to Executive Board: None.

Next Meeting Date: Conference call in about 30 days.

Meeting Adjourned: 4:31 p.m.

Chairperson: Gale Prince.

Membership Committee

Meeting Attendees: Susan McKnight, John Cerveny, Gary Acuff, and Donald Schaffner.

Board and Staff Members Present: Frank Yiannas and Lisa Hovey.

Meeting Called to Order: 3:00 p.m.

Recording Secretary of Minutes: Susan McKnight.

Old Business: None.

New Business: A number of the factors we discussed last year as possibly impacting membership have been changed – a new dues structure is being proposed, the program format was changed to include roundtable presentations along with symposia as well as more time given at the conference to the PDGs to work on next year's symposia (which we hope will foster more opportunities for PDG interactions/discussions of other issues).

Although IAFP membership level has stayed around 3,000 members over the last ten years, hundreds of members drop each year and hundreds of new ones appear. In an effort to better understand what is going on the PDG members asked staff to breakdown the data on the 800 plus individuals who were members last year but did not renew this year as follows:

- Reasons given for not renewing
- If no reason given – last contact attempt (left message and never got a return, no longer with organization, etc.)
- Number of student members on this list
- Number of academics
- Number of international members

It was also asked of staff to breakdown attendance figures from this year's conference as follows:

- Number of international attendees who did not join (non-members)
- Number of current members who attended the conference
- Number of members who did not attend

We wanted to look at this information before the new dues structure goes into effect, (which we hope will positively impact membership).

Lisa Hovey reported in this year's conference registration included approximately 19% Canadian and a 15% non-Canadian/non-American – something which was usually running at 10% in the past conferences.

With this growth in the international attendees to the annual conference, the PDG will seek Board approval to conduct a brief email survey of this year's international attendees to include questions like:

Why did they attend?

Have you presented at an IAFP conference before?

Will you be renewing your membership and/or attend again?

If not, why not?

How can we better serve you?

John Cerveny, Susan McKnight and Lisa Hovey will draft the survey and then circulate the draft to the committee before asking for IAFP approval to conduct the survey. If approved, we hope to survey the international attendees before the new dues structure is announced.

The committee then plans to have a conference call this fall with the breakdown of the 800 non-renewal list, attendance figures and the results of the international survey to determine what the next steps in recruiting/retaining IAFP members makes sense in light of the information.

Recommendations to Executive Board: A brief E-mail survey of this year's international attendees as outlined above (with final draft getting Board approval).

Next Meeting Date: Conference call – Fall 2006.

Meeting Adjourned: 4:00 p.m.

Chairperson: Susan K. McKnight.

Nominating Committee

Meeting Called to Order: 3:30 p.m.

Recording Secretary of Minutes: Larry Beuchat.

Old Business: David Tharp discussed the process that the committee should undertake to establish a list of nominees for the Secretary position for the Executive Board. The goal of the meeting on August 13, 2006 was to select between 6–10 potential candidates. Guidance was provided to seek individuals that have a strong history with IAFP meetings, committees, and activities and for those that have proven leadership abilities and experiences. A finalized list, in order of preference, is requested by the committee to the IAFP Executive Board by the first week of November 2006. Nominations by IAFP Members will be accepted until November 1st. The committee will continue to correspond by conference call until and after that date.

The first task was to provide a comprehensive list of potential candidates – this "initial" list contained 27 individuals. Each of the committee participants provided their top 5 candidates to the committee chair. From this list, the chair compiled a new list that included a numerical value for how many times each potential candidate was listed in the top 5. The "second" list was discussed by the committee that contained 17 potential candidates, ranging from a top score of 5 to a low score of 1. From this list, after discussion, the committee recommended that 6 names be placed on the short list ("third list").

New Business: A tentative conference call was set for November 6, 2006 at 1:00 p.m. to narrow the list down further and to then set a strategy to contact individuals to learn of their interest.

Recommendations to Executive Board: None.

Next Meeting Date: Conference Call on November 6, 2006.

Meeting Adjourned: 4:30 p.m.

Chairperson: Larry Beuchat.

Past Presidents' Committee

Members Present: Michael Brodsky, Jim Dickson, Ann Draughon, David Fry, Kathleen Glass, and Gale Prince.

Board and Staff Members Present: Jeffrey Farber and David Tharp.

Meeting Called to Order: 3:05 p.m. by Jim Dickson in absence of Paul Hall.

Recording Secretary of Minutes: Kathleen Glass.

Old Business: "Code of Ethics" suggested by the Past Presidents Committee in 2004 has not yet been developed. Executive Board recommends changing format from "Code of Ethics" to "Guidelines for Ethical Conduct" to avoid legal implications and enforcement clauses. Committee agrees Guidelines should be developed and recommends appointing an *ad hoc* committee to develop guidelines for ethical conduct. Prepare draft guidelines in time for review by the Executive Board at their Fall 2006 meeting.

New Business:

1. Report received from Jeffrey Farber, IAFP President, on activities of the Association and from David Tharp, Executive Director, on financial progress.
2. All past president committee members need to continue to encourage nominations for IAFP awards to ensure at least one nominee for all categories.

Recommendations to Executive Board:

1. Appoint an *ad hoc* committee to develop guidelines for ethical conduct, with target deadline for draft to be completed by the Fall 2006 Board meeting.
2. Commend David Tharp in recognition of his outstanding leadership which has led to the recent success of the Association.

Next Meeting Date: Sunday, July 8 at IAFP 2007.

Meeting Adjourned: 3:51 p.m.

Chairperson: James Dickson (for Paul Hall).

PROFESSIONAL DEVELOPMENT GROUPS

Applied Laboratory Methods PDG

Attendees: Patricia Rule, Pamela Wilger, Bassam Annous, Michael Brodsky, Donna Christensen, Molly Mills, Orla Cloak, Philip Coombs, William Cray, Ruth Eden, Grace Hall, Lee-Ann Jaykus, Jeff Kornacki, Omar Oyarzabal, George Wilson, Travis Selby, Michael Scott, Patrice Arbault, Mary Lou Tortorello, Susan McCarthy, Jennifer Green, Marlene Janes, Daniel DeMarco, Stephen Varkey, Keith Lampel, Mark Carter, Leslie Thompson, Jinru Chen, Julian Cox, Hidemasa Kodaka, Daniel Brown, Gary Dawn Carl, and Yvonne Hale (on phone).

Board and Staff Members Present: Stan Bailey and Tamara Ford.

Meeting Called to Order: 9:08 a.m., live meeting and teleconference combined.

Recording Secretary of Minutes: Pat Rule and Pamela Wilger.

Agenda

Introduction:

- Welcome members/ Committee/ Sign-in sheets
- Reading of Antitrust guidelines
- Discussion on IAFP 2007 Symposium and Workshops Proposals
- Other 2007 Activities:
- Formation of Sample Prep Working Group: M.L. Tortorello
- Campy Workshop May 2007/University of Auburn/ Omar
- Establish 2007 Teleconference dates

Final Recommendations to be made to Executive Board:

- Any other old business
- Any new business

2007 Program Proposals

Symposium: Current Challenges in the Implementation of Novel Analytical Methodologies in Food Safety and Quality. General Discussion: Unclear of the target audience. Too basic, no real case study of actual companies implementation and challenges encountered in the implementation. Too general for the current attendees of IAFP. Group decided not to submit from the Applied Methods Group can submit as an independent symposium.

Roundtable: Global Harmonization of Microbiological Analytical Methods: Separating the Science from Politics General Discussion: High need for this type of round table: very solid, very timely. Additional view point from FDA for upcoming BAM chapter on validation or different speaker for AOAC (Scott Coates). Solid as is, no changes determined for submittal. Submitted as is.

Action: Request notes to be taken by PDG members of the essence and critical points of the round table for future white paper to be submitted to the *Food Protection Trends*.

Symposium: Biosensors Applied to Foodborne Pathogen Detection: What is The Future?

General Discussion: Very solid, very interesting, totally unique from previous meetings, submitted as is.

Symposium: Sampling and Sample Prep: Unglamorous But Very Necessary.

General Discussion: All thought most critical topic. Some discussion of format to be presented in round table or wet workshop. Importance to capture the information for future years. Final discussion agreed to submit as a symposium in 2007 to be followed in 2008 as a round table with further input from the Sample Prep Working Group.

Wet Lab Workshop: Environmental Sampling of Food and Water.

General Discussion: The following improvements were suggested prior to submittal. Identified the target audience as those taking and making decisions about environmental sampling plans and corrective actions. Added speaker from EPA to address challenges and opportunities of water testing. Added speaker of new and novel approaches to sampling the environment. Vender presentations must be non-commercial. Added speaker for environmental sampling plans, composite methodology, frequency and corrective action. Added speaker for pathogen specific testing vs standard hygiene monitoring.

Workshop: Developing and Improving Your Food Microbiology Laboratory.

General Discussion: Repeat of this years workshop with suggested improvements to enhance based on this years participants comments.

SPECIAL PROJECTS

Working Group on Sample Prep Methodology.

Mary Lou Tortorello/Lee-Ann Jaykus Co-Champions of the group.

General discussion that all thought this was a valid group to be supported by the PDG. Organization based on commodities was discussed. Similar material already being driven by AOAC extension group on Food Matrices. Poster Tues by Russ Flowers P3-11. Lee Ann Jaykus and Michael Broadsky aware of this activity. Will approach AOAC for potential sharing of information and collaboration. Work smart not hard.

Current year to be separate defined group with separate teleconferences from the PDG, but updates to be provided to the PDG teleconferences from the working group.

Recommendation to Board: Request Room to be provided on Saturday at the 2007 IAFP Annual Meeting Room for a face to face meeting of individuals in the subcommittee.

Campylobacter Workshop Feb-May 2007 – Omar Oyarzabal provided update on his proposal for a 3 day Campy workshop to be held at Auburn University, but with the aid of IAFP, titled **Methods for Isolation and Identification of *Campylobacter* spp. from Foods**. The proposal has been submitted for review by the IAFP Executive Board.

Other Old Business: Directory: Decision was made that the IAFP web based directory is sufficient for the group. We will not be pursuing any PDG specific directory.

New Business: Web-based discussion group for the PDG - Julian Cox will facilitate this. User ID and password required.

Next Meeting Dates: Tuesday, November 7, 2006; Wednesday, January 10, 2007; Thursday, March 1, 2007; Tuesday, May 8, 2007; and Sunday, July 8 at IAFP 2007.

Meeting and Teleconference Adjourned: 11:05 a.m.

Recommendations to the Executive Board:

1. Continued support for yearly teleconference and web based presentations to be determined.
2. One-day meeting room on Saturday at 2007 Annual Meeting for purpose of Sample Prep Working Group meeting. (lunch/refreshments?)
3. Ongoing review with executive board for financial support of Campy workshop to be conducted at Auburn University.

Chairperson: Patricia Rule.

Vice Chairperson: Pamela Wilger.

Beverage PDG

Members: Indaue Mello-Hall (Chairperson), Jeffrey Semanchek (Vice Chairperson), Yuhuan Chen, Kenneth Janes, Peter Kennedy, Mickey Parish, James Schuman, and Peter Taormina.

New Members: Stefanie Gilbreth, Peter Bodnaruk, Dan Anderson, Frank Burns, Elena Enache, Paul Hall, Larry Beuchat, Kathy Lawlor, Mathieu Gervais, Debra Foti, Joe Shebuski, and Robin Kalinowski.

Board and Staff Members Present: Vickie Lewandowski.

Meeting Called to Order: 9:00 a.m.

Recording Secretary of Minutes: Jeff Semanchek.

Old Business: None.

New Business:

Chairperson read the IAFP guidelines regarding the meetings and what topics are not allowed to be discussed. A few symposia and workshop proposals were discussed during the meeting.

The chairperson also informed the members of the "Alicyclobacillus and HRM" symposium that will take place on Monday afternoon. An *Alicyclobacillus* breakfast, sponsored by DuPont Qualicon, will be held on Tuesday morning, at 7:00 a.m. in Telus 104. The meeting is open to the attendees and is a joint meeting with ISBT.

The following symposia proposals and workshops were discussed:

1. Suggested Symposia for 2007

Chemicals in Beverages.

Originator: Kathy Lawlor, PepsiCo.

- Chemicals in beverages: Discussing benzene, pesticides, heavy metals, international regulatory perspective etc.
- Symposia to be further developed by K. Lawlor and submit to the Program Committee.

Recommendations from Committee:

- Potential to partner with toxicology PDG – Mark Moorman, Chairperson
 - Discussed various formats to present information
 - Roundtable
 - Symposia
 - Panel
 - Regarding speakers: Discussed having academic speakers to first lay down the science foundation and facts of the benzene phenomenon. International speakers should be included.
2. Suggest Workshop for 2007:

Two days in duration; share lab with local university to make a true hands-on workshop.

Originator: Indaue Mello-Hall, PepsiCo.

Organizers: Emilia Rico-Munoz and Indaue Mello-Hall.

Title: The art of fungal characterization and isolation.

Five topics will be discussed:

1. Safety on handling mold cultures in lab: protecting you from the culture and the culture and you. Suggested speaker – Emilia Rico-Munoz, BCN Research Laboratories.
2. There is something floating in my drink – how do I isolate it? Suggested speaker – Jane Narciso (USDA).
3. Unexpected fermentation in you drink? It can be yeast. Learn how to identify it. Suggested speaker- Graham Fleet, Food Science and Technology, School of Chemical Engineering and Industrial Chemistry and Kiborbeak– Budapest.
4. Common mold that are not that common and can be classified and identified. Suggested speakers– Mary Beth Cousin; Larry Beauchat or James Maryansky.

5. Heat-resistant molds: the enemy of hot-fill beverages. How to identify the enemy. Suggested speaker– Robert Sampson.

Recommendations from Committee:

- To include molecular methods based identification discussion topic, pros and cons. Suggested speaker – Frank, DuPont Qualicon.
- Attendee "Show-n-Tell" – attendees can bring their own mold and discuss the spoilage event of issue.
- Discussion to open the topic to more than just beverages to increase interest. Potential to branch out in 2008 and have the course go in two directions (ex. beverages, cheese, etc.).
- Suggestion to partner with Fruit and Vegetable PDG (meeting at 1:00 p.m.).
Indaue Mello-Hall will submit workshop proposal to program committee

3. Suggested Symposium for 2007

Hot-fill Beverage Studies

Originator: committee

Organizers: Jeff (Kraft) and Peter Taormina (Coca-Cola).

- Possibility of two separate symposia HRM workshop and Challenge studies:
- Challenging new equipment with mold yeast
- Organizing a symposia for 2007 dealing with challenge studies
- HRM; preparation and inoculation
- Equipment commissioning

4. Suggested symposium for 2008

New Age Beverages

Originator: Jay Schuman.

Jay to develop topics and suggest speakers. Ideas will be shared with the committee during the calls.

Request for ideas or suggestions throughout the year for committee to work on. Please e-mail Indaue Mello-Hall.

To effectively pursue PDG goals, PDG will conduct conference calls approximately every 4 months. Meetings to be scheduled well in advance.

Call for Vice-Chair applicants for 2007.

Discussed increasing participation from alcoholic beverage partners.

Beverage PDG Web site: Dan Anderson and Peter Taormina, from Coca-Cola Company, volunteered to be responsible for putting together a Web page for the beverage PDG. They will request for a space in the IAFP Web site.

Recommendations to Executive Board: None.

Next Meeting Date: Sunday, July 8 at IAFP 2007.

Meeting Adjourned: 10:15 a.m.

Chairperson: Indaue Mello-Hall.

Dairy Quality and Safety PDG

Members Present: Kenneth Anderson (Chairperson), Henry Atherton, David Blomquist, Dennis Bogart, Don Breiner, Frank Burns, Warren Clark, Jr., Dan Erickson, Eugene Frey, Dennis Gaalswyk, Ginny Huber, Loralyn Ledenbach, Steven Murphy, John Rushing, Allen Saylor, Ronald Schmidt, Steven Sims, Gaylord Smith, Helene Uhlman, and Philip Wolff.

New Members Present: Gry Dawn Carl, Claudia Coles, and Deon Mahoney.

Visitors Present: Marcelino Kongo, Molly Mills, Caroline Smith DeWaal, Don Lane, and Lyndsey Wells.

Board and Staff Present: Vickie Lewandowski and Tamara Ford.

Meeting Called to Order: 2:07 p.m.

Recording Secretary of Minutes: Lori Ledenbach.

Old Business:

1. Motion passed to revise Mission Statement to read, "To promote the production and processing of safe, high quality dairy products and to develop program topics and symposia for presentation at the IAFP Annual Meetings."
2. The task force committee established at the last meeting to develop an awareness of IAFP and its dairy related programs recommended that contacts from various dairy trade magazines be sent to Tamara Ford for her to include when they distribute their advertisements.
3. Of the four proposals submitted by the DQS PDG last year, two were accepted for this year's program.
4. Steve Sims reported that the task force established to review the "Pocket Guide to Dairy Sanitation" for possible update should delay any revisions until FDA resolves some of the ongoing issues pertaining to product temperature studies as well as the proposed changes to the cGMPs.
5. The project to develop a "Dairy Farm Fieldpersons Handbook: A Pocket Guide to Production of Quality Milk" will be dropped since the Dairy Practices Council already produces such a document. Don Breiner will contact DPC to see if they are interested in having their Guidelines distributed through IAFP. A recommendation will then be made to the Board requesting that Dairy Practices Guidelines be available through IAFP.
6. The DQS PDG has a Web page on the IAFP Web site and it will be a goal this year to update the page, keep the dairy calendar current and add links to other approved Web sites of interest such as the FDA Milk Safety Team.

7. We had our first teleconference call just prior to this year's Annual Meeting which was very successful and conference calls will continue throughout the year as needed.

New Business:

1. Lori Ledenbach will serve as Vice Chair for the remainder of this year and will become Chair of the Dairy Quality and Safety PDG at IAFP 2007. Allen Saylor was voted in as Vice Chair to begin at IAFP 2007.
2. Members continue to be encouraged to submit nominations for IAFP awards, especially the Sanitarian's Award.
3. For this year's symposia proposals, the board suggested that we submit more practical/applied topics such as case studies and problems with solutions identified as opposed to only research oriented.
4. Suggestion was made for the committee to compile a list of expert speakers for State Affiliates and other organizations to use for their educational sessions, etc. This information can be made available on our Web page.
5. A motion passed that this PDG, in consultation with outside experts, write a white paper to submit to the IAFP board to publish and make a press release on the risks of raw milk consumption. On the basis of this paper have IAFP take a public position on this topic.
6. **Proposals for 2007 Symposia:**
 - Cultural Food Safety Norms
 - Global Food Safety Issues – Enhancing or Blocking Dairy Product Trade
 - Emerging Micro Risks in Dairy Products
 - Dairy Industry Growth in Developing Countries
 - Breaking News From the 2007 National Conference on Interstate Milk Shipments (NCIMS)

Recommendations to Executive Board:

1. The DQS PDG would like to nominate Lori Ledenbach as Vice Chair for the remainder of this year and to serve as Chair beginning at IAFP 2007. We also nominate Allen Saylor as Vice Chair beginning at IAFP 2007.
2. We request approval to revise the Mission Statement to read, "To promote the production and processing of safe, high quality dairy products and to develop program topics and symposia for presentation at the IAFP Annual Meetings."

Next Meeting Date: Sunday, July 8 at IAFP 2007 (plus conference calls (2–3) prior to Annual Meeting).

Meeting Adjourned: 4:30 p.m.

Chairperson: Ken Anderson.

Food Hygiene and Sanitation PDG

Meeting Attendees Present: Zeb Blanton, Dennis Bogart, Charles Giambrone, Gary Goessel, Dale Grinstead, David Herweyer, Jeong-Gyo Kim, Jong-Gyn Kim, Kenneth Janes, Ema Maldonado-Siman, Don Lane, Daniel McElroy, Larry Mendes, Gala Miller, Charles Otto, Fred Reimers, Chris Remus, Mary Sandford, Anna Starobin, Pete Snyder, and Gloria Swick-Brown.

Board Member Present: Frank Yiannas.

Meeting Called to Order: 1:05 p.m.

Recording Secretary of Minutes: Dale Grinstead.

Old Business: None.

New Business:

- The antitrust guidelines were reviewed by Zeb.
- Last year's meeting minutes were approved by the committee.
- Zeb mentioned that it was a banner year for the PDG and the 3 symposia that were proposed by the PDG had been accepted by IAFF. All the PDG members were encouraged to attend the symposia if possible.
- Floor was opened for discussion of symposia proposals. There was a proposal by D. Grinstead and a separate proposal by P. Snyder that dealt with hygiene solutions and tools that are used in the retail environment. Because these symposia were relatively similar it we decided to merge them into one symposium. There was some general discussion among the PDG on the content and structure of the symposium. D. Grinstead and P. Snyder were asked to prepare the symposium proposal based on the PDG discussions and to submit them to IAFF by Tuesday a.m.
- A second symposium proposed by D. Grinstead on retail sanitation regulations was discussed. The PDG thought that a more interesting and useful symposium could be developed based on the concept of regulations as the minimum standards for C&S and that it is possible to "raise the bar" and exceed those standards. C. Giambrone, D. Bogart, and D. McElroy assisted by others on the PDG will prepare a symposium proposal as discussed and submit it to IAFF by Tuesday a.m.
- L. Mendes suggested that a symposium on new C&S technologies should be proposed by the PDG. It was decided that the PDG would develop this proposal over the next year and it would be submitted at the '07 meeting in Florida. L. Mendes will have a first draft of the proposed symposium to Zeb within 4-6 weeks.
- F. Reimers suggested that when material is sent around to committee members to review it should be in MS Word format so that changes can be tracked. The PDG agreed.

- D. Grinstead suggested that, during the next year, the PDG attempt to develop a Workshop proposal to submit at the '07 meeting. The PDG agreed and D. Grinstead will have an initial proposal draft to Zeb within 4-6 weeks.
- P. Snyder requested the PDG's support for his suggestion to the IAFF board that symposia be recorded and made available to meeting attendees. The PDG agreed that was a good suggestion.

Recommendations to Executive Board: There were 2 symposia sponsored by the PDG that were scheduled at the same time this year. The PDG would like to recommend that in the future, multiple symposia from the same PDG not be scheduled for the same time.

Next Meeting Date: TBA.

Meeting Adjourned: 2:05 p.m.

Chairperson: Zeb E Blanton, Jr.

Food Law PDG

Members Present: Gordon Hayburn, Tom Schwarz, Ron Weiss, Anna Lammerding, Jenny Scott, Ewen Todd, LeAnn Chuboff, and Mickey Parish.

New Members Present: Louise Fielding, Mohamad Alkanhal, Agnes Tan, Reem Barakat, Deon Mahoney, and Caroline Smith DeWaal.

Guests Present: Gale Prince.

Board Member Present: Kathleen Glass.

Meeting Called to Order: 1:00 p.m.

Recording Secretary of Minutes: Gordon Hayburn.

Old Business: Last year's minutes were reviewed. The aim was the setting up of the PDG. No further business was undertaken.

New Business:

There was a lively discussion on a variety of aspects of food law and ways that the group should be active. The consensus was that the group was heading in the right direction.

Proposal to form a Yahoo Group, which would be open to members only (by application) and moderated by the Chairman. This should be "live" by end of August 2006.

There was a discussion on ways that the group could provide assistance to newly formed agencies etc. - this will in part be covered by the ability to ask questions on the Yahoo group. Further work in this area requires more detailed discussion.

There was a suggestion that the group propose a workshop at some point in the near future to offer updated training in the field of food law. This is something that

was well supported but the group acknowledged that the success of this hinged on the quality of the trainer. This will be further pursued during the year on the Yahoo group.

A symposium on "Preparing Scientists for the legal aspects of a crisis" (in the form of role-plays/discussions/Q&A) is being tabled at the Program Committee meeting on Wednesday. LeAnn Chuboff has kindly agreed to be the organizer of this should it be successful.

The PDG has been approached to take part in a discussion and work on Global Harmonization of Standards for *Listeria* in Foods. The group decided that this was the type of activity that we should be involved in and have accepted the invitation.

Recommendations to Executive Board: None.

Next Meeting Date: Sunday, July 7 at IAFP 2007.

Meeting Adjourned: 3:00 p.m.

Chairperson: Gordon Hayburn.

Food Safety Education PDG

Members Present: Christine Bruhn, Giselle Julien, Jinru Chen, Anthony Flood, Brian Himelbloom, Sandra McCurdy, Gala Miller, and Jan Singleton.

New Members Present: Gary Goessel, Debbie McIntyre, Ema Maldonado-Siman, Bertha Alicia Hernandez-Rodriguez, and Amy Simonne.

Visitors Present: Jonathan Wheeler and Becky Goulding.

Board Member Present: Kathleen Glass.

Meeting Called to Order: 9:00 a.m.

Recording Secretary of Minutes: Christine M. Bruhn.

Old Business: Introductions: Affiliation of the fourteen members attending concluded government agencies, university, food company, and private company. Merging of the Outreach Education and Food Safety Network PDGs was discussed.

The Mission Statement of the New PDG is: *Provide IAFP members and their clientele information on food safety education.*

New Business: A symposium for the 2007 Annual Meeting was developed. The focus will be identifying those factors that lead to behavior change in food safety. Validating effectiveness will also be addressed. Presentations will address agricultural production through consumer handling.

Members discussed the range of food safety information currently available through government, university, and commodity or special interest organizations. The PDG members believed the best way to serve at this time is to identify food safety educational resources for member

uses. This will include (1) identifying web based brochures or Q and A's targeted for specific audiences and (2) providing information on food safety web pages. The subcommittee will use the evaluation instrument previously developed. We propose designating a location on the IAFP web page that identifies and links to these resources. Subcommittee members include Bertha Alicia Hernandez-Rodriguez, Brian Himelbloom, Giselle Julien, Ema Maldonado-Siman, Debbie McIntyre, Sandy McCurdy, Amy Simonne, and Christine Bruhn.

New Officers:

Sandy McCurdy was elected Vice Chair. Paul Uhler will be asked to serve as Vice Chair after Sandy McCurdy.

Recommendations to Executive Board:

1. We seek support for the proposal to identify and coordinate food safety educational resources.
2. We ask for staff support to place the information developed on the web page and to implement the appropriate links.
3. We seek approval of the following mission statement: To provide IAFP members and their clientele information on food safety education.

Next Meeting Date: Sunday, July 8 at IAFP 2007.

Meeting Adjourned: 10:45 a.m.

Chairperson: Christine M. Bruhn.

Food Toxicology and Food Allergens PDG

Members Present: Chair: Mark Moorman, Vice Chair: Catherine Nnoka, Tim Adams, Richelle Beverly, Lindsay Arthur, Peter Cressey, Ginny Edleman, T.J. Fu, Don Lane, Gary Pruitt, Michael Roberson, and Peter Slade.

Guest Present: Kathleen Lawlor.

Board Member Present: Frank Yiannas.

Introductions

Agenda handed out

1. Welcome and Introductions
2. Chair and Vice Chair Positions
3. Purpose of PDG
4. Securing Interest in the Toxicology and Allergy Worlds
5. 2006 Symposium
6. Other Topics

Meeting Called to Order: 9:10 a.m.

Recording Secretary of Minutes: Catherine Nnoka.

Old Business: PDG chair Mark Moorman reviewed the group's previous activities. The concept for the group emerged in 2002 when IAFP members acknowledged that while IAFP had emerged as a leader in the microbial food safety area, this was not true of the food toxicology area, and that there was no real avenue for the membership to explore these issues within the organization.

Catherine and Mark worked with Joseph Scimeca and the ILSI North America Technical Committee on Food Toxicology and Safety Assessment who took the initiative to organize a Symposium on Current Issues in Food Toxicology at IAFP 2003 in New Orleans. Members interested in food toxicology gathered at the New Orleans meeting and decided to petition the board to form a new PDG on Food Toxicology and Food Allergy PDG.

In collaboration with the ILSI North America Technical Committee on Food Microbiology, who helped support the first few years of the PDG, the group went on to organize a Technical Session on Food Toxicology 101: Basics for the Food Safety Professional at the 2004 IAFP Annual Meeting in Phoenix, Arizona and a Symposium on Safety Concerns of Food Chemical Contaminants at the 2005 Annual Meeting in Baltimore, Maryland.

Outreach efforts by the PDG included special mailings to Society of Toxicology members in 2003 and 2005 with information about IAFP and the PDG and invitations to attend the annual meeting sessions related to food toxicology.

New Business: The PDG discussed the positions of chair and vice chair. When they undertook to start up the PDG in 2002, the current chair and vice chair, Mark Moorman and Catherine Nnoka, agreed to play an initial leadership role, hoping that more suitable candidates trained in food toxicology and engaged in addressing these issues in a more direct fashion would emerge as the group coalesced. T. J. Fu and Peter Slade, from the National Center for Food Safety and Toxicology, agreed to take over as the chair and vice chair of the PDG for two-year terms of office to begin right after the 2006 Annual Meeting. It was noted that although they come from the same organization, T. J. Fu is an FDA employee, while Peter Slade is affiliated with the academic (Illinois Institute of Technology) side of the NCFST consortium.

Mark Moorman reviewed the program for PDG's 2006 offering, a symposium on Food Allergen Control at Retail and Food Service, scheduled for Wednesday afternoon, August 16, 2006. This symposium was organized in collaboration with the Retail Food Safety and Quality PDG.

Members discussed future activities and developed a program proposal for a roundtable session on Management and Control of Chemical Hazards in Foods for the 2007 Annual Meeting in Florida.

A facilitator/moderator would be chosen and asked to give a brief overview presentation describing the topics to be covered and the objectives of the session. Five to seven speakers would then be asked to spend 10 minutes presenting their perspective on each issue selected for roundtable discussion. The remaining time would be spent on Q&A with the audience. Not only would questions be taken in real-time from the floor, but members would be given an opportunity to submit issue/questions in advance of the meeting via the IAFP Web site.

Topics suggested by PDG members to be addressed during the roundtable included the following:

1. Heavy metals in food
2. Mycotoxins and natural toxins
3. Food fortification (long term effects and potential risks to the consumer)
4. Pesticides, residues, and organics
5. Packaging
6. HACCP as applied to chemical hazards
7. Food allergens
8. Consumer perceptions of risk

It was agreed Catherine Nnoka and Mark Moorman would submit this preliminary roundtable program outline to the IAFP program committee on Tuesday, and that the final program would be developed by volunteers from the PDG. The following members agreed to work with the incoming chair and vice chair, T. J. Fu and Peter Slade, to finish developing the roundtable program: Lindsay Arthur, Don Lane, Gary Pruitt, and Michel Roberson.

In addition, members agreed to partner with the new Beverage PDG to organize a session on Chemical Contaminants in Packaged Beverages at IAFP 2007. Topics to be covered in this session included benzene, heavy metals, pesticides, and regulatory issues. Peter Slade agreed to work with Kathleen Lawlor from the Beverage PDG to organize this collaborative effort.

Recommendations to Executive Board:

1. The Food Toxicology and Food Allergy PDG request the board's approval to change the group's name to: Professional Development Group on Food Chemical Hazards and Food Allergy.

Next Meeting Date: Sunday, July 8 at IAFP 2007.

Meeting Adjourned: 11:00 a.m.

Chairperson: Mark Moorman.

Fruit and Vegetable Safety and Quality PDG

Members Present: Suresh Pillai, Bassam Annous, Larry Beuchat, Shirley Bohm, Fred Breidt, Michael Cooley, Ruth Eden, James Gorny, Robert Gravani, Jack Guzewich, Linda Harris, Keith Ito, Kali Kniel, Mark Kreul, Les Lipschutz, Wendy Maduff, Humberto Maldonado-Garcia, Bahir Manji, Susan McKnight, Jena Roberts, William Schwartz, Thomas Schwarz, Amarat Simonne, Ethan Solomon, Stacy Stoltenberg, Leonard Williams, and Randy Worobo.

New Members Present: Alejandro Castillo, Larry Cohen, Michael Roberson, Michelle Danyluk, Keith Warriner, Manan Sharma, Terry Peters, Elizabeth Bihn, Karin Rosberg, Sanja Ilic, Trevor Suslow, Donna Garren, Keith Lampel, Larry Kohl, Montserrat Hernandez Iturriaga, Leopoldo Orozco Ramirez, Molly Warren, Peter Slade, and Mary Lou Tortorello.

Visitors Present: Jennifer Cascarino and Jonathan Wheeler.

Board Member Present: Stan Bailey

Meeting Called to Order: 1:00 p.m.

Recording Secretary of Minutes: Alex Castillo.

Old Business: None.

New Business:

1. The Chair (Suresh Pillai) made the introductory remarks followed by Stan Bailey who made introductory remarks on behalf of the IAFP Executive Board. The PDG members introduced themselves.
2. The Chair asked for nominations for the Vice-Chair position. There were 2 nominees (Fred Breidt and Alex Castillo). A show of hands was used for the voting process. Alex Castillo was elected as the Vice-Chair.
3. The Chair inquired if a listserv would be useful for the PDG. The value of a moderated discussion group was noted.
4. The following topics were discussed:
 - a. Jack Guzewich with the FDA gave an overview of the recent foodborne outbreaks associated with produce. He highlighted the implication of a non-O157:H7 serotype in an outbreak. He also mentioned the outbreak associated with a rare *Salmonella* serovar.
 - b. The industry response to the outbreaks was presented by Jim Gorny. He mentioned that research projects have been initiated in California to address these recent outbreak issues.
 - c. The issue of the microbiological quality of irrigation water was discussed. Issues associated with sampling, lack of microbial standards and the challenges of irrigation water quality were discussed. It was mentioned that we should not overlook the chemical quality of irrigation water as well. The issue of using potable drinking water standards for irrigation water quality was brought up. However, some of the participants expressed reservation about this approach.
 - d. Time/temperature controls for post-harvest handling was also discussed. The value of having a symposia on time/temperature controls was favored by many participants. A symposium on this topic has been proposed.
 - e. The standardization of International GAP audits was discussed. Alex Castillo mentioned that countries who try to export to markets generally have a good idea of what they need to be doing. Jim Gorny mentioned that the need to develop markets would dictate the adoption of GAP (by a particular country) and trying to harmonize standards was unnecessary. There was mention

that standardization of such audits may be the purview of the Codex Alimentarius. Alex Castillo mentioned the need for data to accurately assess the impact of GAP in reducing foodborne illness.

- f. Fred Breidt raised the issue of using biocontrol strategies as an intervention tool. It was mentioned that biocontrol has applications in the meat and poultry industries, however, not so for the produce industry.
 - g. Sampling of produce for enteric viruses on produce was brought up. Suresh Pillai mentioned that sampling would be important to collect data to understand the exposure routes.
5. Symposia ideas were discussed. Bob Gravani suggested that a sub-committee of the PDG get together to come up with a list of ideas for submission. Three symposia ideas/titles are being forwarded to the Program Committee for consideration. They are:
 - a. Role of Time/Temperature Control to Assure Produce Safety,
 - b. Biofilms in Food and Food Environments, and
 - c. Produce Safety: Keeping Up with Interventions and Regulations.
 6. The issue of off-site workshops was brought up by Alex Castillo. He mentioned that a workshop in Latin America was doable. Bob Gravani mentioned that a recent off-site workshop in California was an example of a successful workshop.

Recommendations to Executive Board:

1. There were no specific recommendations.

Next Meeting Date: Sunday, July 8 IAFP 2007.

Meeting Adjourned: 2:45 p.m.

Chairperson: Suresh Pillai.

Meat and Poultry Safety and Quality PDG

Meeting Attendees: Margaret Hardin, Mueen Aslam, Daniel McElroy, Todd Bacon, Wafa Birbari, Peter Bodnaruk, Mark Berrang, Dennis Burson, John Butts, John Cerveny, Timothy Dambaugh, Roger Cook, Julian Cox, Peter Cressey, Paul Gernardt, Randy Huffman, Richard Holley, Vijay Juneja, Mark Kreul, Tineke Jones, Robin Kalinowski, Ema Maldonado-Siman, Alejandro Mazzotta, Eric Line, Thomas McCaskey, Lynn McMullen, Omar Oyarzabal, Justin Ransom, Bala Sampathkumar, John Sofos, Joe Shebuski, Harshavardhan Thippareddi, Dan Brown, Leonard Williams, Jeff Kornacki, Bill Slater, Jennifer Johnson, Mike Musgrove, Travis Selby, John Hudson, Timothy Freier, John Wendell, Alfred Fain, Paula Fedorka-Cray, David Herweyer, Veny Gapud, Mohamad Al-Kanhal, and Bertha Hernandez-Rodriguez.

Board Member Present: Stan Bailey.

Meeting Called to Order: 2:05 p.m.

Recording Secretary of Minutes: Dan McElroy.

Old Business: The chair welcomed members and visitors and read the mission of the PDG and reviewed antitrust guidelines. All attendees were asked to introduce themselves and update contact information for current members or sign in as a new member or visitor as applicable. The chair reviewed the symposia developed last year by the PDG to be presented at this year's annual meeting and thanked all who participated in the development of these symposia.

S12 – *Campylobacter* – From Gate to Plate

(Organizer: Richard Arsenault)

S18 – A New Crack at Egg Safety: From Hen House to Your House

(Organizer: Michael Musgrove)

S21 – Assuring Microbiological Safety of Organic Products

(Organizer: Harshavardhan Thippareddi)

Stan Bailey, Board Liaison welcomed all attendees to Calgary and reminded all of the special events at this year's meeting including the sponsored lunches and receptions in the Exhibit Hall on Monday and Tuesday. He also reviewed the new deadline for symposia submission for Tuesday at 10 a.m. and the Program Committee meeting at 7 a.m. on Wednesday. In addition, the program will begin at 6 p.m. this evening so in response to requests from the membership that it end earlier than in years past.

New Business:

- At the request of the PDG members, updates on Avian Influenza and Food Defense were presented. Stan Bailey updated the PDG on the current status of Avian Influenza particularly as it related to H5N1 and suggested for additional information members attend the presentation by David Swayne at 1:30 p.m. on Wednesday (Hot Topics in Food Safety; Macleod D). He also discussed some resources currently available and recommended that members look to the Avian Influenza and associated links available on the Food Protection website for a more complete list. Some of the more recently updated fact sheets include those published by the WHO (World Health Organization). Questions were fielded relating to virus inactivation and recently updated USDA FSIS consumer cooking guidelines (165°F internal temperature) for poultry. The PDG chair will also make available on the PDG website, links to additional fact sheets and papers relating to this issue. Margaret Hardin updated the PDG on the current status of food defense as it relates to USDA FSIS inspected facilities and handed out copies of the most recently issued FSIS Directive.
- Suggested symposia topics for the IAFFP Meeting 2007 were reviewed and discussed.

- Justin Ramson suggested a symposium on Food Safety in International Trade. This idea was also raised last year. An international conference (Keil) held earlier this year might impact how this issue is addressed. Justin will follow up to find when results from that meeting will be available.
- Margaret Hardin presented submissions for symposia on food defense from Isabel Walls (Protecting the food supply from terrorist threats) and from Lynda Collins Kelley (Food Defense Research).
- All Natural Products has garnered additional attention in our industry this past year. Members agreed that this issue needs further attention and John Cerveny and Wafa Birbari will work on a submission to address the risks associated with these processes and products.
- Dan McElroy suggested the idea of looking at Education and Training at the processing plant level. In the past most educational symposia have addressed this issue either for retail/foodservice or consumers. Dan will develop a symposium to examine some of the challenges the meat and poultry industry faces in this area as well as present case studies of actual training programs and successes.
- In keeping with the quality aspect of the Meat and Poultry PDG, a symposium was suggested to address microbial spoilage in fresh and RTE meats, from causes and case studies to real solutions and control. Peter Bodnaruk and Lynn McMullen will further develop this idea for submission.
- Suggested topics for consideration that were tabled until 2008 include: auditing (either as a workshop or symposium), methods for pathogen quantification (suggestion to work with the methods PDG on this idea), probiotic use in foods, and education techniques to address the needs of smaller processing facilities for *Listeria* control.
- A recommendation from PDG members to the Chair asked for an exploration of ways to communicate with members more often throughout the year. Two suggestions that were made were conference calls and/or a web cast. In addition, a recommendation was made that the PDG set an earlier deadline for symposium submissions prior to the meeting so PDG members can review these ideas before the committee meeting and spend less time at the meeting on actual symposium development.

Recommendations to Executive Board: None.

Next Meeting Date: June 10, 2007.

Meeting Adjourned: 3:35 p.m.

Chairperson: Margaret D. Hardin.

Microbial Risk Analysis PDG

Meeting Attendees: Kevin Webster, Don Schaffner, Marcelino Congo, Michelle Danyluk, Anna Lammerding, Yuhuan Chen, Sarah Parker, Andrew Hudson, Peter Cressey, John Rushing, Mark Domanico, Becky Goulding, Keith Ito, Elisabeth Dean, Reem Barakat, Tony Valenzuela, Agnes Tan, Morgan Wallace, Vijay Juneja, Neelam Narang, Fumiko Kasuga, Deon Mahoney, Jenny Scott, Leon Gorris, Aamir Fazil, Mickey Parish, Lee-Ann Jaykus, and Ewen Todd.

Visitor Present: Mark Domanico.

Board Member Present: Kathleen Glass.

Meeting Called to Order: 10:03 a.m.

The Chair welcomed all present and explained the purpose and scope of the PDG. All attendees were asked to briefly introduce themselves, giving their affiliation and interest in Microbial Risk Analysis. Sign-in forms were circulated. The agenda proposed by the chair was accepted by the meeting, no further items were added.

Ahead of the meeting, the PDG roster was circulated and members were requested to nominate or volunteer as PDG vice chair candidates. This position is a four-year responsibility (2 years vice chair, 2 years chair). One nomination was received ahead of the meeting, namely Mickey Parish. No other nominees were received at the meeting. The meeting approved of Mickey as the new PDG vice chair.

Kathleen Glass commented that the IAFP Board would like the PDG to contribute ideas to innovative programming for next year's meeting and to consider developing activities that for instance, are more applied, involve workshops, pamphlets, booklets, whitepapers, or roundtables. The deadline for submitting proposals is Tuesday morning (10 a.m.). On Wednesday, the program committee will meet and there will be an opportunity for PDG chairs to promote symposium and other ideas from their group.

The chair presented the minutes from last years meeting, which were approved and adopted.

Recording Secretary of Minutes: Leon Gorris and Mickey Parish.

Old Business: The chair circulated a PowerPoint presentation (embedded file) in which he recalled the symposia that had been successfully put together for the current Annual Meeting by the PDG members and their collaborators (slides 5 and 6). He also noted symposia and events of potential interest to PDG members (slides 7-12).

New Business: Aamir Fazil used the PowerPoint presentation (slides 13-25) summarizing activities that he was aware of that might be of interest to PDG members.

Some topics covered:

- WHO, FAO activities (<http://www.who.int/foodsafety/micro/jemra/en/index.html> or http://www.fao.org/es/esn/jemra/background_en.stm)
- 2nd IAFP Europe Symposium (www.foodprotection.org)
- Society for Risk Analysis Annual Meeting, 3-6 December, Baltimore (www.sra.org),
- 3rd International Conference on Microbiological Risk Assessment, Paris (spring 2009).
- International Symposium on Agroterrorism (Kansas City, 25-29 Sept, 2006).
- Food Safety Risk Analysis Clearinghouse – a one stop shop for RA, MRA, MRM and risk communication resources (<http://www.foodrisk.org/index.cfm>).
- Cost Action 920. Bringing together MRA interested parties across Europe (<http://www.cost920.com/>)
- Combase – database of microbial models and data (www.combase.cc).
- International Food Law Distance Education Certificate program (<http://vu.msu.edu/preview/anr-ifl/>).

In the course of Aamir's presentation, discussion raised the following activities of interest:

- ICD/FAO/WHO Microbiological Risk Assessment training package, with slides and notes to be used by trainers/educators. Public version to be posted on <http://www.icd-online.org/an/html/actionrisk.html>.
- FAO/WHO Risk Analysis Manual, to be posted on http://www.fao.org/es/esn/food/control_ramanual_en.stm.
- 2005 IAFP Symposium on "recontamination in the food industry" in Prague, Czech Republic. Abstracts and presentations posted (find through www.foodprotection.org "meetings" tab).
- 5th International Conference on Predictive Modelling in Foods entitled "Predictive modeling in Foods – Fundamentals, State of the Art and New Horizons" to be held in Athens on the 2nd or 3rd week of September 2007. Preliminary web site <http://smas.chemeng.ntua.gr/icpmf>.

Mickey Parish noted new and continuing University of Maryland/JIFSAN online courses in Food Safety Risk Analysis:

- Two-track series of four 10-wk distance online courses in Risk Analysis: Track 1 (for academic credit) leads to Graduate Certificate from UM; Track 2 leads to JIFSAN certificate of completion in Food Safety Risk Analysis <http://www.jifsan.umd.edu/pd2006>.
- First course to begin in December 2006.

Deon Mahoney informed the meeting that Food Standards Australia together with their New Zealand counterpart had been developing so-called "through chain" food standards based on risk assessment information. These deal with many foods and hazards, both microbial and chemical. Over recent years, work

was done on dairy products, with a focus currently on raw milk products, and egg products. They use a risk-profiling approach, which is more descriptive than quantitative. All their work is published and accessible through the general Web site www.foodstandards.gov.au. On behalf of Peter Snyder, Aamir raised an issue on the communication of risk control measures to stakeholders such as retailers, food service operators and home preparers. Many of these don't really feel that they are affected by food safety risks and thus do not need to implement food safety controls. Peter was looking for discussion partners on the topic to develop an opinion, white paper or symposium. This would fit in with the Board's recommendation of more innovative programming. The meeting discussed interests in working with Peter. Ewen Todd mentioned a link with the Communicable diseases working group that he and Peter could explore in the direction of an opinion/white paper. Lee-Ann Jaykus was interested in a 2007 symposium, bringing together speakers that could highlight different angles of the risk communication challenge or ways to convince stakeholders of the importance of food safety controls, such as:

- Risk communication / message delivery,
- Social sciences issues,
- Legal aspects (Gap between higher level management and work-floor)
- Cost factors / extended shelf life as selling factors

The symposium could well take the format of a debate / round table session.

Symposia/Workshops 2007

Some discussion was conducted on alternate formats for the symposia including a debate on topical issues. The concept was appreciated, but no specific topics were identified or proposals put forward. This idea was put on the table for consideration next year.

Other new ideas were raised and may be worked on at the meeting for submission to the program committee (via PDG chair or directly to IAFP staff).

- Mickey Parish and Ewen Todd (and Peter Snyder) "through chain risk communication"; including retail and home practices. Not commodity specific.
- Morgan Wallace: Uptake of qualitative / quantitative approaches to risk assessment in risk management and policy making. Might be tabled for the moment. A link with the Food Law PDG might be explored.
- Ewen Todd and Anna Lammerding. Considering non-risk/safety aspects in decision making on hazards. Could cover International Risk Governance framework, Resources for the Future (Sandra Hoffman) presentation on economical and behavioral aspects influencing risk. Aamir could give a practical example of social aspects considered.
- Leon Gorris and Vijay Juneja: Making FSO-PO-PCs tangible for operational stakeholders such as industry and consumers.

Workshops:

- Yuhuan Chen and Don Schaffner proposed to set-up a Predictive Modelling workshop which would target practical aspects of PM and PM tools, with some cover of risk analysis
- Amir Mokhtari proposed a workshop on application of sensitivity and uncertainty analysis techniques to microbial exposure and risk assessment models. He gave this before at SRA. The PDG meeting felt this might be rather technical and might not suite the IAFP audience, but Aamir was going to submit it on Amir's behalf.

Recommendations to Executive Board:

1. To accept the nomination of Mickey Parish as vice chair of the PDG.

Next Meeting Date: Sunday, July 8 at IAFP 2007.

Meeting Adjourned: 12:15 p.m.

Chairperson: Aamir Fazil.

Retail Food Safety and Quality PDG

Members Present: Alfred Fain, Veneranda Gapud, Zeb Blanton, Jinru Chen, Jong-Gyu Kim, C. Harold King, Thomas McCaskey, Larry Mendes, Charles Papa, Fred Reimers, Jena Roberts, William Schwartz, Thomas Schwarz, Amy Simonne, O. Peter Snyder, and Gloria Swick-Brown.

New Members Present: Michael Roberson, Marjorie Jones, Yeon-Kyung Lee, Kisun Yoon, Donna Garren, Larry Kohl, Margaret Hardin, Thomas Ford, Todd Bacon, Mary Sandford, and Richelle Beverly.

Visitors Present: Gale Prince and Jeong-Gyoo Kim.

Board Member Present: Frank Yiannas.

Meeting Called to Order: 10:05 a.m.

Recording Secretary of Minutes: Veny Gapud.

Old Business: Chairman Al Fain reviewed the PDG mission statement and read the anti-trust guidelines to the attendees. Executive Board Frank Yiannas announced the new deadline for symposium submission to be Tuesday at 10:00 a.m. Chairman Al Fain discussed the E-mail election of Veny Gapud as the new Vice Chair. Additionally, Al Fain announced the 2006 symposia co-sponsored by the Retail Food Safety and Quality PDG.

- S19 Cleaning and Sanitation for Retail and Food Safety-Identifying the Issues. Organized and convened by O. Peter Snyder and Dale Grinstead. Tuesday at 1:30 p.m. at Glen 203-204 sponsored jointly with the Food Hygiene and Sanitation PDG.

- S24 Food Allergen Control at Retail and Foodservice. Organized by Mark Moorman, Catherine Nnokia, and Kathleen O'Donnell with input from Veny Gapud. Wednesday at 1:30 p.m. at Macleod BC sponsored jointly with the Food Toxicology and Food Allergens PDG.

New Business: Symposium topics for 2007 were solicited by Chairman Al Fain via e-mail in June, 2006. A symposium proposal entitled Using HACCP to Innovate New Processes in Retail Food Operations was submitted by O. Peter Snyder. The symposium will address significant hazards and needed controls in retail cold holding, using TCS criteria to identify hazardous food in an inventory, validation of pasteurization for a recipe item, validation of hot holding temperatures, food cooling, and extended shelf life of chilled foods.

In addition, a symposium was proposed on The Science for New and Improved Retail Cleaning and Sanitation Procedures as a continuation of the 2006 Symposium S19 on Cleaning and Sanitation for Retail Food Safety-Identifying the Issues.

Recommendations to Executive Board: Motions were made, seconded and passed to submit the following recommendations to the board:

1. The Executive Board should consider ways to alter the PDG committee meeting schedules to prevent overlapping. We suggest shortening of the meeting times to one hour if that will help prevent schedule conflicts.
2. The PDG recommends that the Executive Board should explore ways to record sessions and posters and provide the CD free to the conference attendees.

Next Meeting Date: July 8, 2007.

Meeting Adjourned: 11:35 a.m.

Chairperson: Alfred R. Fain, Jr.

Seafood Safety and Quality PDG

Meeting Attendees: Peter Hibbard, Marlene Janes, Brian Himelbloom, Kathleen Rajkowski, Morgan Wallace, Timothy Dambaugh, Marjorie Jones, Susan McCarthy, Joe Fraiser, Jon Bell, Zeb Blanton, Richelle Beverly, Al Fain, Lee-Ann Jaykus, Lorraine McIntyre, Mickey Parish, and Brooke Whitney.

Board Member Present: Vickie Lewandowski.

Meeting Called to Order: 1:05 p.m. – Chairperson: Peter Hibbard, Vice Chair: Marlene Janes.

Recording Secretary of Minutes: Brian Himelbloom.

Old Business:

1. Minutes of 2005 Meeting – available on IAFFP Web site: Rajkowski moved, Bell second – approved.
2. Seafood Safety and Quality PDG Membership Roster – provided to attendees for updates – Attached.
3. Announcement of IAFFP Symposium # S20 – Public Health and Environmental Impact Assessments in the Aftermath of Hurricanes Katrina and Rita – Symposia scheduled for Wednesday morning August 16, 2006. A brief summary of the symposia was given by Marlene Janes. This will include multi-agency presentations followed by a panel discussion.
4. Election of a Vice Chair for the PDG will need to be accomplished at the next of annual meeting in Orlando in July 2007. Kathleen Rajkowski and Jon Bell both expressed an interest in being considered for this position.

New Business:

1. Symposia submitted at last year's meeting – 3 were proposed / 1 was accepted with modifications. PAC Vickie Lewandowski (Board Liaison) offered some recommendations for symposia guidance and development.
2. Risk-based Harmonization of Global Seafood Safety Standards – This was proposed last year and was brought forward again this year. After discussion, it was recommended that this symposia be further developed and built on a format of a roundtable in collaboration with the Water Quality and Safety PDG. Kathleen Rajkowski will coordinate this development with the Water Safety and Quality PDG and the Seafood PDG.
3. The Wrath of Vibrios "Past, Present and Future" symposia was developed for submission for 2007. Recent outbreaks of *Vibrio parahaemolyticus* have shown the need for understanding how these outbreaks have occurred, what environmental factors have contributed to the increase in the population of these pathogens and what can be done to prevent outbreaks in the future. *Vibrio vulnificus* wound infections are of concern to handlers of Seafood and how they can be prevented. The IAFFP attendees will get an overview of the regulations associated with Vibrios in shellfish and what new strategies are being developed to control Vibrios in seafood.

This symposium will have the proposed topics and speakers:

- Historical perspective for handling *Vibrio parahaemolyticus* outbreaks "Case study of western coast" – FDA
- Historical perspective for handling *Vibrio parahaemolyticus* outbreak "Case study of eastern coast" – Steven Otwell
- *Vibrio vulnificus* wound infections associated with food handlers – CDC

- Theory of environmental impact on how *Vibrio* populations are established – TBD
- Overview of regulations for Vibrios in shellfish - Liliana Rodriguez, CFIA
- Where do we go from here ‘mitigating strategies’ – Lee-Ann Jaykus

Organizer Name: Marlene Janes.

Suggested Conveyors: Marlene Janes and Susan McCarthy.

4. “Contamination and Control of *Listeria monocytogenes* in Ready-to-eat Seafood” symposia was developed for submission for 2007.

This symposium will have the proposed topics and speakers: *Listeria monocytogenes* is a growing concern for the Ready-to-eat seafood industry. Understanding why *L. monocytogenes* is of concern, how to control it in seafood processing plants and rapid methods for detecting this pathogen is an important issue to the attendees of the IAFP meeting.

- Contamination of seafood processing plants “DNA typing study.”
- Sanitation control procedures for *L. monocytogenes* in seafood processing plants.
- Intervention and control strategies for *L. monocytogenes* in seafood products. Jennie Scott, FDA
- *Listeria monocytogenes* in smoked finfish. Susan McCarthy, FDA.
- Rapid methods for monitoring *Listeria* species in seafood processing plants. Marlene Janes, LSU AgCenter.
- Panel discussion, composed of industry representatives.

Organizer Name: Marlene Janes.

Suggested Convenors: Marlene Janes and Susan McCarthy.

Recommendations to Executive Board: None.

Next Meeting Date: Sunday, July 8 at IAFP 2007.

Meeting Adjourned: 3:00 p.m.

Chairperson: Peter Hibbard.

Student PDG

Meeting Attendees: Hudaa Neetoo, Bertha Alicia Hernandez-Rodriguez, Wendy Maduff, Richelle Beverly, Yesim Soyer, Yvonne Chan, Jason Huck, Angela Laury, Linda Harris, Michelle Danyluk, Yuewei Hu, Maria Teresa Felicio, Elizabeth Hillyer, John Bruhn, Christine Bruhn, Montserrat Hernandez, Manan Sharma, Larry Beuchat, Karin Meharden, Amy Simonne, Anna Lammerding, Jen Cascarino, Kali Kniel, Jovana Kovacevic, Melissa Haveroen, Kevin Webster, Eb Chiarini, Silvia Dominguez, Karla Mendoza, Raquel Lenati, Lorraine McIntyre, Richelle Beverly, Sara Milillo, Brian Kim, Leopoldo Orozco, Peter Hibbard, Jenny Scott, Arpan Bhagat, Sandy Moorhead, Azadeh Namvar, J. Marcelino Kongo, and Norashikin Ab. Aziz.

Board and Staff Members Present: Jeffrey Farber, Gary Acuff, Kathleen Glass, Terry Peters, Vickie Lewandowski, Maria Teresa Destro, David Tharp, and Lisa Hovey.

Meeting Called to Order: 12:00 p.m.

Recording Secretary of Minutes: Hudaa Neetoo.

Old Business: Recommendation was made to the Executive Board for student representation on the new membership committee. Recommendation was accepted by the Board.

New Business: Introduction by the chair of the incoming SPDG Executive Committee:

Chair:	Laura J. Bauermeister
Vice Chair:	Brooke Whitney
Secretary:	Hudaa Neetoo
Treasurer:	Julie McKinley

Promotion of more student involvement in the SPDG by the Committee Members. The Committee requested students to submit articles for publication in the SPDG Newsletter.

Guest Speaker Dr. Michael T. Musgrove, USDA-ARS, Research Food Technologist, Athens, GA delivered a talk entitled: “How to Finish Your Ph.D in 15 Years or Less.”

Recommendations to Executive Board: None.

Next Meeting Date: Sunday, July 8 at IAFP 2007.

Meeting Adjourned: 1:35 p.m.

Chairperson: Laura J. Bauermeister.

Viral and Parasitic Foodborne Disease PDG

Meeting Attendees: Sabah Bidawid (Chair), Dean Cliver, Gail Greening, Jack Guzewich, Lee-Ann Jaykus, Tineke Jones, Timothy Dambaugh, Alain Houde, Julie Jean, Kali Kniel, Adrian Parton, Suresh Pillai, Thomas Schwartz, Kirsten Mattison, Efi Papafragkou, Mark Domanico, Marilyn Lee, Julie Brassard, Vijay Juneja, Elizabeth Hillyer, Charles Bartleson, and Jennifer Cascarino.

Board Member Present: Gary Acuff.

Meeting Called to Order: 9:10 a.m.

Recording Secretary of Minutes: Kirsten Mattison.

Old Business: Sabah reviewed minutes from last year’s meeting. Announced this year’s symposium of the viral and parasitic PDG and encouraged participants to attend. Lee-Ann Jaykus (co-convenor of the symposium) gave a brief description of the symposium, sponsored by ILSI.

New Business: A total of 24 people were present. Sabah Bidawid welcomed attendees to this year’s Viral and Parasite PDG meeting. This was followed by a round table introduction of participants (old and new members). Gary Acuff, as a liaison from the IAFP Executive Board, suggested that we keep in mind how

to involve affiliate members as we develop our symposium, possibly by integrating applied topics to draw those members to the IAFP meeting. Sabah suggested symposia topics to start the discussion are Emerging Pathogens, Environmental Transmission, and New Methodologies. He initiated discussions and encouraged participants to come up with ideas for a new symposium for next year's IAFP meeting. He also circulated an E-mail sent by Doris D'Souza and Nigel Cook (both were absent) for potential topics for next year's symposium. Participants offered new ideas and various suggestions for the upcoming symposium, and mention was made of the possibility of linkages with the Fruits & Vegetables PDG and the Control of Communicable Diseases PDG as we develop the symposium. Tom Schwartz – noted that there are many questions being asked about avian influenza and that increased discussion would be useful to provide answers for industry. Kirsten Mattison – indicated a current study in Canada (C-EnterNet) trying to collect data that begins to address some of the questions for transmission routes and the existence of viral, parasitic and bacterial pathogens in retail products. Suresh Pillai suggested including control of viruses at the retail products level as industry is looking for suggestions for solutions to the problem, i.e., what is the HACCP point? What about industry involvement. The group would like to see a discussion of disinfection methods, hopefully avoiding reference to brands of products. Gail Greening – New Zealand has many outbreaks from cruise ships or other travelers where the tour can be traced following outbreaks around the country, out of the country and back again. Could present data as part of a transmission route symposium. Jack Guzowich – Need to discuss parasites as well. How does *Cyclospora* get on produce? Need to know where to intervene.

In summary, suggested symposium topics focused on: mechanisms of viral transmission, how to handle an outbreak at the retail level of food contamination, how to and what to use to disinfect and control virus dissemination at a food establishment, fears vs. realities of emerging viral and parasitic pathogens (e.g., avian influenza), foodhandler's role in food contamination (shedding of norovirus in asymptomatic or pre-symptomatic individuals), norovirus genotypes and foodborne outbreaks, viral indicators in foods, where, what and how to apply intervention strategies, and the role of the environment in food contamination. A proposed symposium is being put together by Sabah and Kirsten.

Recommendations to Executive Board: None.

Next Meeting Date: Sunday, July 8 at IAFP 2007.

Meeting Adjourned: 10:25 a.m.

Chairperson: Sabah Bidawid.

Water Safety and Quality PDG

Members Present: Larry Cohen (Chairperson), Peter Kennedy (Vice-Chairperson), Michael Brodsky, Louise Fielding, Susan McKnight, Wendy Maduff, Adrian Peters, and Kathleen Rajkowski.

New Members Present: Dean Cliver, Daniel DeMarco, Trevor Suslow, and Stephen Varkey.

Board Member Present: Kathleen Glass.

Meeting Called to Order: 2:05 p.m.

Recording Secretary of Minutes: Susan McKnight.

Old Business: Larry Cohen opened the 2006 meeting. Introductions – around the room.

Discussion of Chair for 2007 since Larry Cohen will serve this year only. Peter Kennedy, Quality Flow, was nominated to be Vice Chair this year and serve as Chair next year. Kathleen Rajkowski will assist Larry and Peter to facilitate PDG conference calls during the upcoming year.

New Business: Peter Kennedy discussed the Beverage PDG meeting early today. A discussion ensued to more clearly define the differences between the PDGs. Members of this PDG belong to other PDGs where water plays a role, but we see ourselves as the water advisors. Our PDG is very willing to collaborate with all PDGs. Kathleen Glass (Board Liaison) will speak to the Beverage PDG about collaboration in areas of overlap.

Discussion around ideas for next year's symposium.

Roundtable – Water Emergencies – Too Much, Too Little, Too Late What's the plan?

Overview of problem – Susan McKnight (Kraft pictures).

1. Water shortages – Western US – Gerba referral.
2. AWWA – Disaster preparation from the utility viewpoint – Susan McKnight.
3. Local public health department's role in water during disasters – Walkerton/public health in Ontario - Michael Brodsky contact.
4. What does foodservice industry do with the boil water alert – Louise/Adrian UK foodservice company contact?

Moderator – Michael Brodsky.

Convenors – Michael Brodsky and Susan McKnight.

Questioners: Louise Fielding and Peter Kennedy.

A request will be made to the Executive Board to videotape the 2006 Roundtable Symposium for purposes of capturing the notes. Then a summary will be provided by the PDG of this roundtable discussion for possible publication in *Food Protection Trends*.

(Be sure to include questions on disinfection by-products.)

Recommendation to set-up a Yahoo Discussion Board to use for developing a handbook on Water Disasters. Kathleen R. will facilitate PDG Conference Calls for members during the year. Investigate into Net meeting format via an internet agency.

Recommendations to Executive Board:

1. The Water Quality and Safety PDG plans to develop a comprehensive handbook about water disasters issues in food safety and food protection. Target 1-2 years for development and publishing. We will not require any budgeted costs except for cost of printing after gaining the required IAFP approvals.

Note: This year's roundtable will provide summarized - capture discussion for potential publication of summary afterwards. Louise Fielding, Kathleen Rajkowski and students will take notes and give them to Larry Cohen for collect/combine. Larry will then submit the summary of the 2006 Roundtable - Global Water - HACCP Issues to be published in the *Food Protection Trends* publication.

The Symposium Roundtable - Water Emergencies - Too much, too little, too late what's the plan? will be turned in to the IAFP registration desk for submittal on Tuesday, August 15th.

Next Meeting Date: Sunday, July 8 at IAFP 2007.

Meeting Adjourned: 4:00 p.m.

Chairperson: Larry Cohen.

Affiliate Council Minutes

IAFP 2006 – August 13-16, 2006
Held at the Hyatt Regency Calgary
Calgary, Alberta, Canada

Affiliates Present:

Alabama	Tom McCaskey
Alberta	Lynn McMullen
Associated Illinois MFES	Dennis Gaalswyk
Brazil	Maria Teresa Destro
British Columbia	Terry Peters
California	John Bruhn
California, Southern	Margaret Burton
Florida	Peter Hibbard
Georgia	David Fry
Indiana	Helene Uhlman
Kentucky	Matt Rhodes
Korea	Kijae Cho
Metropolitan	Fred Weber
Michigan	Janet Phelps
Missouri	Gala Miller
New York	Steve Murphy
New Zealand	Roger Cook
Ohio	Gloria Swick-Brown
Ontario	Kathy Wilson
Pennsylvania	Eugene Frey
Quebec	Julie Jean
Texas	Fred Reimers
United Kingdom	David Lloyd
Upper Midwest	Dan Erickson
Washington	Stephanie Olmsted
Wisconsin	Kathleen Glass

Board Members and IAFP Staff Present: Jeffrey Farber, Frank Yiannas, Gary Acuff, Stan Bailey, Vickie Lewandowski, Kathleen Glass, David Tharp, Lisa Hovey, and Nancy Herselius.

Guests: Zeb Blanton, Florida; Allen Sayler, Capital Area; Joe Heidenreich, Norway; Judy Greig and Janet Harris, Ontario.

Meeting Called to Order: 7:01 a.m.

Approval of Agenda: Moved adoption by Helene Uhlman second by Gloria Swick-Brown – carried.

Recording Secretary of Minutes: Maria Teresa Destro.

Call to Order: The meeting was called to order at 7:01 a.m. by Affiliate Council Chair Terry Peters. A sign-up form for attendees was signed by delegates and guests. There were 38 members and guests present.

The minutes of the 2005 Affiliate Council meeting were reviewed by the delegates and present. Motion by David Fry, second by Helene Uhlman to approve the minutes presented. Motion carried.

Report from Affiliate Council Chairperson: Terry Peters announced the 2006 Affiliate Award Winners and the disposition of the 2005 recommendations to the Executive Board.

Report from the IAFP President, Jeffrey Farber: The IAFP President discussed progress and activities from the past year. Membership is stable at approximately 3,000, the number of Gold Sustaining Members has doubled to 8 in the past year, and there are 10 Silver Sustaining Members. No new international affiliates were created during 2006, but Nordic countries, Japan, Australia, India, and Spain all are making progress toward forming affiliates. The Foundation Committee has created a promotional DVD and has increased the Foundation to approximately \$350,000. The student PDG and other student/young scientist activities of IAFP are growing.

Report from the IAFP Office: David Tharp provided an update of activities in the past year. The general fund balance is approximately \$500,000, and the annual operating budget is approximately \$2,500,000. Lunches and receptions at this year's Annual Meeting are being held in the Exhibit Hall to increase contact time with exhibits and posters this year.

Nancy Herselius stated that she would like to have more information regarding Affiliates activities, and also pictures from the meetings to add to the newsletter.

Election of the Affiliate Council Secretary: The name of Carl Custer, Capital Area Food Protection Association was placed in nomination by Maria Teresa Destro and

second by Terry Peters. Terry Peters asked for nominations from the floor. Motion was made to approve Custer (Olmsted/ Fry). By voice vote the motion was carried. As Carl was not present, a short bio was read by Terry Peters.

Unfinished Business: Fred Reimers, Texas, raised the importance of having the Affiliate slide show during the annual meeting, to increase the visibility of the Affiliates. It was reinforced that Affiliates should send pictures from their meetings to be added in this presentation. It was suggested that there be a call for photos in the newsletter. Stan Bailey suggested that a DVD with photos of the Annual meeting could be prepared and sent to the Affiliates to show in their meetings. Motion by Fred Weber, second by Lynn McMullen – carried.

Margaret Burton, Southern California, asked for a change in her Affiliate name on the Affiliate listing, to facilitate potential new members to reach them. She suggested that it be listed as “California, Southern”, so that the two Californias can be seen together.

Dan Erickson, Upper Midwest, brought up that Saturday and Sunday functions may not be well attended because of lack of visibility. He suggested that there be more visibility of the pre-meeting activities, for example, by highlighting these activities in the confirmation of registration that is sent to the attendees. Motion by Fred Weber, seconded by Janet Phelps, to provide earlier information on the Saturday and Sunday functions.

New Business: Terry Peters explained the reasons for not having the Educational Session/ Affiliate Reception this year. David Tharp explained how this Educational Session/ Affiliate Reception was first conducted and how it had changed. Some discussion was carried out, and the possibility of canceling the Educational Session/ Affiliate Reception was raised. Helene Uhlman showed her concern on that, since it could cause a shrink in Affiliate

Council exposure and opportunity for networking. Roger Cook suggested that members of the Affiliate Council could be the speakers in such sessions. Motion by Fred Weber, second by Tom McCaskey, that the reception part merges with the Members Reception. For next year, the Florida Affiliate agreed to find a speaker and funds for the Educational Session. Kathy Wilson from Ontario volunteered to help them. Terry Peters informed that members of the Awards Committee had difficulty in seeing the differences in between Best Affiliate Educational Conference and Best Affiliate Annual Meeting awards. After some discussion it was concluded that both awards be retained and redefined. Motion by Stephen Murphy, second by Fred Weber, to refer this to the Awards Committee.

Fred Weber commented on having problems in receiving reminders for filling out Affiliate Reports. It was suggested that the reminders should be sent to the Affiliate President and Delegate. Nancy Herselius said she would do that for next year.

Affiliate Reports: Affiliate delegates present gave a brief summary of their activities over the past year.

Recommendations to the Executive Board:

1. Give more visibility and advanced notice of pre-Annual Meeting functions.
2. Prepare a DVD with Annual Meeting pictures and send it to the Affiliates.

Passing of the Gavel: Chairperson Terry Peters passed the gavel to Maria Teresa Destro signifying the beginning of her term as Affiliate Council Chair.

Next Meeting Date: Sunday, July 8 at IAFP 2007.

Adjourned: 10:04 a.m.

Chairperson: Terry Peters.

Recommendations to the Executive Board as Taken from Committee Minutes of Meetings Held in Calgary, Alberta, Canada

Executive Board Response as Discussed at the Executive Board Meeting

STANDING COMMITTEES

Food Protection Trends Committee

Recommendations to Executive Board:

1. To conduct a survey to determine the type and content of articles that readers wish to see in *FPT*. The survey should indicate that *FPT* is not an indexed journal.
Board Response: The Board supports conducting a reader survey and will ask the staff to complete this prior to IAFP 2007.
2. To discontinue the career services section (i.e., job opportunities) because of the new "Career Services" section now available on the IAFP Web site. The loss in revenue to IAFP would be negligible.
Board Response: The Board does not agree with this recommendation. If an employer does wish to place a job advertisement in *FPT*, the journal should allow this.
3. To add a statement to the *FPT* "Instructions for Authors" to indicate that *FPT* is not an indexed journal.
Board Response: The Board agrees. Note: After further investigation it was found that *FPT* is indexed by *Agricola*, *Food Science and Technology Abstracts*, and *CAB Abstracts*. This will be noted in the "*FPT* Instructions for Authors."
4. To add a section on "PDG News" to *FPT*, with solicitation of PDGs to submit news, information, white papers, etc. for publication in *FPT*. Julian Cox agreed to spearhead this effort if approved.
Board Response: The Board agrees.

JFP Management Committee

Recommendations to the Executive Board:

1. To appoint a subcommittee to develop a strategic plan to provide a competitive advantage to *JFP* for growth in manuscripts and readership.
Board Response: The Board agrees and recommends forming the subcommittee immediately so it may work throughout the current year and provide a report at IAFP 2007.

2. To provide information on the *JFP* Web page informing the advantages and services the page charge provides to the authors.
Board Response: The Board agrees.
3. To encourage authors of accepted manuscripts related to survival, growth, and inactivation of spoilage and pathogenic microorganisms to submit their data to ComBase.
Board Response: The Board agrees and directs staff to add this information in the author's acceptance letter.

SPECIAL COMMITTEES

3-A Committee on Sanitary Procedures

Recommendations to Executive Board: None.

Audiovisual Library Committee

Recommendations to Executive Board:

1. Implementation of a "Two Strikes and You're Out" Policy for use of the AV library. If a member fails to return materials checked out in a timely manner twice in one year, their library privileges would be suspended for some period with Board approval.
Board Response: The Board recommends that we try more aggressive follow up on overdue materials before applying this approach.

Awards Committee

Recommendations to Executive Board: None.

Committee on Control of Foodborne Illness Committee

Recommendations to Executive Board:

1. The committee recommends that the five food worker papers be published in the *Journal of Food Protection*.
 - Description of the Problem, Methods and Agents Involved
 - Size, Severity and Settings
 - Description of Outbreak Categories
 - Transmission Mechanisms
 - Control Measures and Recommendations

Board Response: The Board remains supportive of this project. Selection of journal will need to be made upon completion of the manuscripts.

2. The committee recommends that the Procedures to Investigate Foodborne Illness manual be revised to include the bioterrorism component for publication by September 30, 2006 and further revisions of the manual will be done in 2007 for a final 6th edition to be completed by Sept. 30, 2007.

Board Response: The Board agrees.

3. The committee recommends that the Procedures Manual be put into an electronic format for ease of editing in the future.

Board Response: The Board agrees.

4. Funding for three day meeting (possibly D.C. area) in Jan. 2007 for four members to continue work on final two food worker papers and updating the Procedures Manual.

Board Response: The Board agrees to support this meeting.

Constitution and Bylaws Committee

Recommendations to Executive Board:

1. Randy Daggs will be the chair of the C&B for 2006/2007. Recommended that Steven Murphy be appointed as vice chair for the C&B Committee for 2007/2008 and chair for 2008/2009.

Randy Daggs will be the chair of the C&B for 2006/2007.

Board Response: The Board accepts the Committee's recommendation.

2. Status of current committee members needs to be reviewed and additional appointments made as needed.

Board Response: The Board encourages any interested Members to join the Committee. Committee Members should also recruit new Members for the Committee.

Foundation Committee

Recommendations to Executive Board: None.

Membership Committee

Recommendations to Executive Board:

1. Conducting a brief E-mail survey of this year's international attendees.

Board Response: The Board agrees.

Nominating Committee

Recommendations to Executive Board: None.

Past Presidents Committee

Recommendations to Executive Board:

1. Appoint an *ad hoc* committee to develop guidelines for ethical conduct, with target deadline for draft to be completed by the Fall 2006 Board Meeting.

Board Response: The Board agrees.

2. Commend David Tharp in recognition of his outstanding leadership which has led to the recent success of the Association.

Board Response: The Board agrees.

Program Committee

Recommendations to Executive Board: None.

PROFESSIONAL DEVELOPMENT GROUPS

Applied Laboratory Methods PDG

Recommendations to Executive Board:

1. Continued support for yearly teleconference and Web based presentations to be determined.

Board Response: The Board supports these efforts and encourages other Committees and PDGs to hold teleconferences or Web presentations.

2. 1 day meeting room on Saturday at 2007 Annual Meeting for purpose of Sample Prep Working Group meeting. (lunch/refreshments?)

Board Response: The PDG may work with the IAFP office to schedule this meeting.

3. On going review with executive board for financial support of *Campylobacter* workshop to be conducted at Auburn University.

Board Response: The Board supports development of this workshop and staff will work further with the workshop organizers.

Beverage PDG

Recommendations to Executive Board: None.

Dairy Quality and Safety PDG

Recommendations to Executive Board:

1. The DQS PDG would like to nominate Lori Ledenbach as Vice Chair for the remainder of this year and to serve as Chair beginning at IAFP 2007. We also nominate Allen Saylor as Vice Chair beginning at IAFP 2007.

Board Response: The Board agrees.

2. We request approval to revise the Mission Statement to read, "To promote the production and processing of safe, high quality dairy products and to develop program topics and symposia for presentation at the IAFP Annual Meetings."

Board Response: The Board agrees.

Food Hygiene and Sanitation PDG

Recommendations to Executive Board:

1. There were 2 symposia sponsored by the PDG that were scheduled at the same time this year. The PDG would like to recommend that in the future, multiple symposia from the same PDG not be scheduled for the same time.
Board Response: The Program Committee does try to take into consideration topic of the session, developing group and anticipated audience before assigning time slots for symposia. Sorry that this was missed in 2006.

Food Law PDG

Recommendations to Executive Board: None.

Food Safety Education PDG

Recommendations to Executive Board:

1. We seek support for the proposal to identify and coordinate food safety educational resources. We ask for staff support to place the information developed on the web page and to implement the appropriate links.
Board Response: When ready for posting on the IAFP Web site, please contact the IAFP office and it will be promptly posted.

Food Toxicology and Food Allergens PDG

Recommendations to Executive Board:

1. The Food Toxicology and Food Allergy PDG requests the Board's approval to change the group's name to: Professional Development Group on Food Chemical Hazards and Food Allergy.
Board Response: The Board agrees to change the name of this PDG to Food Chemical Hazards and Food Allergy Professional Development Group.

Fruit and Vegetable Safety and Quality PDG

Recommendations to Executive Board: None.

Meat & Poultry Safety and Quality PDG

Recommendations to Executive Board: None.

Microbial Risk Analysis PDG

Recommendations to Executive Board:

1. To accept the nomination of Mickey Parish as vice-chair of the PDG.
Board Response: The Board agrees.

Retail Food Safety and Quality PDG

Recommendations to Executive Board:

1. The Executive Board should consider ways to alter the PDG committee meeting schedules to prevent overlapping. We suggest shortening of the meeting times to one hour if that will help prevent schedule conflicts.
Board Response: Staggering of meeting start times seems to work best. When meetings were scheduled for one hour, too many meetings were running longer and caused problems.
2. The PDG recommends that the Executive Board should explore ways to record sessions and posters and provide the CD free to the conference attendees.
Board Response: The Board requests the PDG to provide samples of successful use of conference recordings.

Seafood Safety and Quality PDG

Recommendations to Executive Board: None.

Student PDG

Recommendations to Executive Board: None.

Viral and Parasitic Foodborne Disease PDG

Recommendations to Executive Board: None.

Water Safety and Quality PDG

Recommendations to Executive Board:

1. The Water Quality and Safety PDG plans to develop a comprehensive handbook about water disasters issues in food safety and food protection. Target 1-2 years for development and publishing. We will not require any budgeted costs except for cost of printing after gaining the required IAFP approvals.
Board Response: The Board agrees with this effort and encourages other PDGs to consider developing similar booklets or pamphlets.

Affiliate Council

Recommendations to the Executive Board:

1. Give more visibility and advanced notice of pre-Annual meeting functions.
Board Response: Staff will work to give pre-meeting functions additional visibility.
2. Prepare a DVD with Annual Meeting pictures and send it to the Affiliates.
Board Response: Staff will work to prepare a slide show of Annual Meeting pictures for distribution to Affiliate meetings. In addition, staff will ask Affiliate representatives to send pictures taken at their meetings for use in a slide presentation at IAFP's Annual Meeting.

IAFP Foundation Silent Auction Results

Over \$8,300 Raised!

High Bidder

Henry Atherton
Henry Atherton
Henry Atherton
Paula Avery
Todd Bacon
Todd Bacon

Donna Bahun
Bert Bartleson

Paul Baxter
Steve Berry
Margaret Binkley
Tamsin Campbell
Tamsin Campbell
Norm Carlson

John Cervený
Greg Coburn
Larry Cohen
Larry Cohen
Larry Cohen
Mike Cooley
Carol Deibel

Carol Deibel
Barb Determan
Francisco Diez
Ed Donnell
Natalie Dyenson
Emilio Esteban
Joao Fernandes
Louise Fielding
Dennis Gaalswyk
Sonya Gambriel-Lenarz
Sonya Gambriel-Lenarz
Kathy Glass

Michael Gorman
Anthony Govender

Patrick Gustavson
Paul Hall

Paul Hall
Andrew Hall
Hisham Harami
Janet Harris

Gordon Hayburn

Orly Hayut
Joe Heidenreich
Joe Heidenreich
Joe Heidenreich
Joe Heidenreich
Joe Heidenreich
Peter Hibbard

Ron Hillard
Lisa Hovey
Kellie Jackson
Kellie Jackson
Candace Jacobs
Candace Jacobs
Candace Jacobs
Candace Jacobs
Pat Johnson

Item

Italian Intermezzo-Menus and Music
Every Night Italian
Bushbabies
Mooona Lisa Poster
Cabernet Sauvignon Arkansas Wine
Bumper Sticker Collection:
TNTC, HACCP, MOO
Every Night Italian
In Focus w/Bookmark

Preventing Foreign Material Contamination of Foods
1 Dozen Titleist Golf Balls
Wisconsin Cheese Stress Cow
PepsiCo "Tropicana/Quaker" Gift Bag
PepsiCo "Frito Lay" Gift Basket
Automatic Aerosol Deodorant/
Insecticide System 12 Odor Concentrate Cans
Ice Wine
Aveda Products Basket
Microbiology of Fresh Produce
Signed Baseball
Yakety Nell Cow
La Promenade-Hand Painted Sculpture
Taste of Chicago Gift Card

Half Gallon New York Maple Syrup
Bonnie Mohr Print
Corny Cow
MEHA Pen Light
Chocolate Milk Stress Cow
Mr. Coffee 12 Cup Coffee Maker
Inflatable Chocolate Cow
Wisconsin Bungee Gliderz
Galileo Thermometer
Aretha Franklin - 5 CD Set
Complete HACCP Advantage Package
Standard Methods for the Examination
of Dairy Products
2002 DuPont 200th Anniversary Chevrolet
Monte Carlo Diecast Replica
Gift Basket (shirt, recipe book,
and assorted food items)
Food Safety and Security Windbreaker
Scenic Driving the Ozarks w/Bookmark
Pink Freshwater Pearl Necklace (36" Strand)
Wind Jacket with CFA Logo
Fluffy Fine Cow
IAFP 2006 Canada Sweatshirt

"Cases in Human Parasitology" & "Cases
in Medical Microbiology and Infectious Diseases"
Wine Cooler
IAFP 2006 Calgary Bandana
IAFP 2006 Calgary Bandana
IAFP 2006 Calgary Bandana
IAFP 2006 Calgary Bandana
IAFP 2006 Calgary Bandana
"Vikings. The Discovery of America"
with Wooden Viking Ship
Signed Baseball
Treasury of Country Recipes Cookbook-Land O'Lakes
Team Canada Hockey Jersey "Ryan Smyth" & Cap
Miss Haywire
Wine Cooler
Ipod Shuffle
Wales Mouse Mat
3-Month Cheese of the Month
1 Week Package-Serhs Natal Hotel

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Wisconsin Association for Food Protection
University of Arkansas
Weber Scientific

Wegman's Food Markets, Inc.
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Blackwell Publishing
DuPont Qualicon
Wisconsin Association for Food Protection
PepsiCo
PepsiCo
Zep Manufacturing Company

Maple Leaf Consumer Foods
Cindy Hess
American Society for Microbiology
American Meat Institute
Wisconsin Association for Food Protection
Metropolitan Association for Food Protection
Associated Illinois Milk, Food and Environmental
Sanitarians

New York State Association for Food Protection
Capitol Vial
Wisconsin Association for Food Protection
Michigan Environmental Health Association
Wisconsin Association for Food Protection
Nasco
Wisconsin Association for Food Protection
Wisconsin Association for Food Protection
Thermor Ltd.
Grant Denormandie
HACCP Advantage
Weber Scientific

DuPont Qualicon

The Little Potato Company, Ltd.

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Association
David and Connie Tharp
Canadian Federation of Agriculture
Wisconsin Association for Food Protection
Ohio Association of Food and Environmental
Sanitarians
ASM Press

DSM Food Specialties
Alberta Association for Food Protection
Alberta Association for Food Protection
Alberta Association for Food Protection
Alberta Association for Food Protection
Alberta Association for Food Protection
Food Diagnostics

American Meat Institute
rtech Laboratories, Division of Land O'Lakes
Alberta Association for Food Protection
Alberta Association for Food Protection
DSM Food Specialties
Food Safety Net Services
United Kingdom Association for Food Protection
Washington Association for Food Protection
Brazil Association for Food Protection

High Bidder

Robin Kalinowski
 Sam Kennedy
 Sam Kennedy
 Jim Kostuch
 Dave Larson
 Lori Ledenbach

Lori Ledenbach
 Vickie Lewandowski
 Daryl Loback
 Robert Longley
 Robert Longley
 Lisa Lucia
 Dean Mahoney
 Eric Martin
 Ed Mather
 Alejandro Mazzotta

Susan McCarthy
 Alan McCurdy
 Lorraine McIntyre
 Lynn McMullen
 Lynn McMullen
 Lynn McMullen
 Lynn McMullen
 Pattie McNiel
 Pattie McNiel
 Indaue Mello-Hall
 Indaue Mello-Hall

Indaue Mello-Hall
 Indaue Mello-Hall
 Sara Milillo
 Gala Miller

Gala Miller
 Gala Miller
 Melissa Mundo

Steve Murphy
 Son Nguyen

Lisa Olson
 Lisa Olson
 Karl Olson
 Sarah Parker
 Brenda Patton
 Thilde Peterson
 Janet Phelps
 Mohan Ponnudrai

Gale Prince
 Gale Prince
 Kathleen Rajkowski
 Carl Rocha
 Michael Roberson
 Bill Schwartz
 Catie Simpson
 Peter Slade

Gaylord Smith
 Richard Sprenger
 Richard Sprenger
 Larry Steenson
 Larry Steenson
 Marty Stephanic
 Katie Swanson
 Nobu Tanaka
 Nobu Tanaka
 Carl Teravainen
 Connie Tharp
 Lou Tortorello
 Fred Weber
 Claudio Zweifel

Item

PepsiCo "Gatorade" Sport Gift Bag
 Post Familie Arkansas Wine
 Oliver Soft Red Wine
 Food Safety Icon CD
 Waterford Crystal Wine Bottle Coaster
 Margaritaville Cookbook, Oven Mitt, Apron,
 Salt Shaker, Jimmy Buffett CD
 Say Cheese, Wisconsin Cow Parade Figurine
 Purdy's Chocolates Gift Basket
 "Six Nations" Rugby Shirt
 Food Microbiology: An Introduction
 Black Traveling Bag (on wheels)
 Bonnie Mohr Poster
 Set of 6 Rubber Cows
 Food Safety and Security Windbreaker
 Ontario Ice Wine
 Wilk Ducks, Geese and Swans Puzzle

Terra Brasil
 Pinnacle Gold Golf Balls
 Memory Stick with Journals
 Tastefully Simple Products Basket
 Golf Bag
 PepsiCo "Pepsi" Gift Bag
 Neige Ice Cider
 Burger King Hat and T-shirt
 Strawberry Cow Parade Figurine
 Legal Sea Foods \$100 Gift Certificate
 IAFP 2006 Silent Auction Mystery Item—
 Personal DVD Player
 IAFP 2005 Annual Meeting Shirt
 StormGlass Barometer
 Burger King Hat and T-Shirt
 Looking North: Royal Canadian
 Mounted Police Illustrations
 Rodeo Statue
 Fondation de la memoire
 Taste of Chicago Gift Card

Ontario Ice Wine
 The Handbook of Food Science,
 Technology and Engineering
 US Flag Flown Over White House
 Wyoming Environmental Health Association T-shirt
 Ethnic Letter Opener
 Wales Mouse Mat
 Burger King T-Shirt
 Publix Grocery Cart and Goodies
 2007 Annual Meeting Registration
 Automatic Aerosol Deodorant/Insecticide System
 + 12 Odor Concentrate Cans
 "Panorama" Notepad/Pencil Holder
 Cheese Necklace
 3 Pounds of New York State Cheddar Cheese
 "Six Nations" Rugby Shirt
 Foodborne/Waterborne Illness Booklets
 Wisconsin CowBelly
 Memory Stick with Journals
 IAFP 2006 Canada Coat

Beefeater—It Ain't Natural Cow Parade Figurine
 IAFP European Symposium on Food Safety
 Crystal Food Safety Partner Mickey
 "Foodborne Six" Silk Necktie
 Food Safety and Security Windbreaker
 Wizard of Oz Cow Parade Figurine
 Grow a Boyfriend
 Wind Jacket with CFA Logo
 Polo Shirt and Golf Balls
 Vincent Moono Cow Poster
 Classic Cooking with Pork
 Cornell University Sweatshirt
 Oliver 2004 Rieslin
 IAFP 2004 Annual Meeting Shirt

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 University of Arkansas
 Purdue University
 IAFP
 Southern California Association for Food Protection
 Florida Association for Food Protection

Wisconsin Association for Food Protection
 British Columbia Food Protection Association
 United Kingdom Association for Food Protection
 American Society for Microbiology
 Takara Mirus Bio
 Capitol Vial
 Wisconsin Association for Food Protection
 Weber Scientific
 Ontario Food Protection Association
 Missouri Milk, Food and Environmental Health
 Association
 Brazil Association for Food Protection
 Wisconsin Association for Food Protection
 Texas A&M University
 Vickie J. Lewandowski
 Orkin
 PepsiCo
 Quebec Food Protection Association
 Burger King Corporation
 Fred Weber
 Advanced Instruments, Inc.
 IAFP Foundation

David and Connie Tharp
 Thermor Ltd.
 Burger King Corporation
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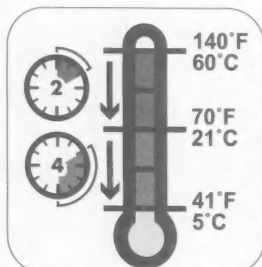
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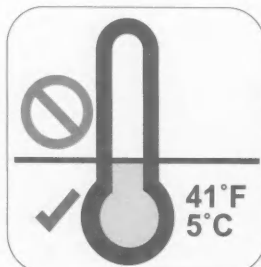
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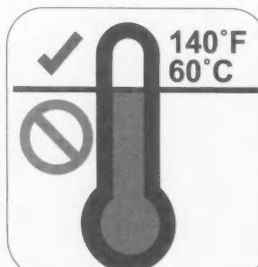
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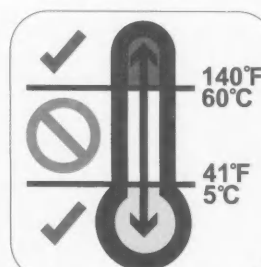
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Presentation Format

1. Technical — Oral presentations will be scheduled with a maximum of 15 minutes, including a two to four-minute discussion. LCD projectors will be available and computers will be supplied by the convenors.
2. Poster — Freestanding boards will be provided for presenting posters. Poster presentation surface area is 48" high by 96" wide (121.9 cm x 243.8 cm). Handouts may be used, but audiovisual equipment will not be available. The presenter will be responsible for bringing pins and velcro.

Note: The Program Committee reserves the right to make the final determination on which format will be used for each presentation.

Instructions for Preparing Abstracts

1. All abstracts must be written in English.
2. All abstracts must be approved and signed off by all authors before submission.
3. Title — The title should be short but descriptive. The first letter in each word in the title and should be capitalized.
4. Authors — List all authors using the following style: first name or initials followed by the surname.
5. Presenter Name and Title — List the full name and title of the person who will present the paper.
6. Presenter Address — List the name of the department, institution and full postal address (including zip/postal code and country).

7. Phone Number — List the phone number, including area, country, and city codes of the presenter.
8. Fax Number — List the fax number, including area, country, and city codes of the presenter.
9. E-mail — List the E-mail address for the presenter.
10. Format preferred — Check the box to indicate oral or poster format. The Program Committee reserves the right to make the final determination of presentation format.
11. Category — The categories are used by the Program Committee to organize the posters and technical sessions. Please check the box which best describes the category for which the abstract is suitable.
12. Developing Scientist Awards Competition — Check the box to indicate if the presenter is a student wishing to be considered in this competition. The student will make the initial submission, and IAFP will E-mail the abstract to the major professor, who will complete the submission process. For more information, see "Call for Entrants in the Developing Scientist Awards Competitions."
13. Abstract — Key the abstract into the web-based system. In addition, a double-spaced copy of the abstract, typed in 12-point font in MS Word, should be E-mailed to IAFP at the time of submission. Use no more than 300 words. Abstracts are most often rejected because of a failure to follow the instructions below.

In addition to following these instructions, authors should carefully review the sections on selection criteria and rejection reasons as well as the sample abstracts (available online) before submitting the abstract. Original research abstracts **MUST** be in the following format:

Introduction: State the reason for pursuing this work (2–3 sentences)

Purpose: State the purpose or objectives of the study (1–2 sentences)

Methods: State the methodology used in the study (2–3 sentences). The methods should be specific enough that researchers in the same or similar field would understand the basic experimental design or approach.

Results: Describe the results obtained in the study (2–3 sentences). NOTE: Specific results, with statistical analysis (if appropriate), MUST be provided. A statement of “results pending” or “to be discussed” is not acceptable and will be grounds to abstract rejection. Results should be summarized, do NOT use tables or figures. **Significance:** State the significance of the findings to food safety and/or public health (1–2 sentences) NOTE: Do not include reference citations in the Abstract. Please see sample abstracts for further guidance on abstract structure.

Education abstracts MUST present an improvement or innovation on a proven method in order to educate others (about a food protection related topic). There should be a way to measure the outcomes and substantiate the improvements and/or outcomes. If measured, the sample size should be sufficiently large to represent the intended population.

Abstract Submission

Abstracts submitted for IAFP 2007 will be evaluated for acceptance by the Program Committee. Please be sure to follow the instructions above carefully; failure to do so may result in rejection. Information in the abstract data must not have been previously published in a copyrighted journal.

Abstracts must be received no later than January 16, 2007. Completed abstract and information must be submitted online. Use the online submission form at www.foodprotection.org. In addition, a double-spaced copy of the abstract, typed in 12-point font in MS Word, should be E-mailed to IAFP at the time of submission. You will receive an E-mail confirming receipt of your submission.

Selection Criteria

1. Abstracts must be structured as described above.
2. Abstracts must report the results of original research pertinent to the subject matter. Papers should report the results of new, applied studies dealing with: (i) causes (e.g., microorganisms, chemicals, natural toxicants) and control of all forms of foodborne illness; (ii) causes (e.g., microorganisms, chemicals, insects, rodents) and control of food contamination and/or spoilage; (iii) food safety from farm-to-fork (including all sectors of the chain including production, processing, distribution, retail, and consumer phases); (iv) novel approaches for the tracking of foodborne pathogens or the study of pathogenesis and/or microbial ecology; (v) public health significance of foodborne disease, including outbreak investigation; (vi) non-microbiology food safety issues (food toxicology, allergens, chemical contaminants); (vii) advances in sanitation, quality control/assurance, and food safety systems; (viii) advances in laboratory methods; and (ix) food safety risk assessment. Papers may also report subject matter of an educational nature.
3. Research must be based on accepted scientific practices.

4. Research should not have been previously presented nor intended for presentation at another scientific meeting. Papers should not appear in print prior to the Annual Meeting.

Rejection Reasons

1. Abstract was not prepared according to the “Instructions for Preparing Abstracts.” This includes abstracts that are too lengthy.
2. Abstract reports inappropriate or unacceptable subject matter.
3. Abstract is not based on accepted scientific or educational practices and/or the quality of the research or scientific/educational approach is inadequate.
4. Potential for the approach to be practically used to enhance food safety is not justified.
5. Work reported appears to be incomplete and/or data and statistical validity are not presented. Percentages alone are not acceptable unless sample sizes (both numbers of samples and sample weight or volume) are reported. Detection limits should be specified when stating that populations are below these limits. Indicating that data will only appear in the presentation without including them in the abstract is NOT acceptable.
6. Abstract was poorly written or prepared. This includes spelling and grammatical errors or improper English language usage.
7. Results have been presented/published previously.
8. Abstract was received after the deadline for submission.
9. Abstract contains information that is in violation of the International Association for Food Protection Policy on Commercialism.
10. Abstract subject is similar to other(s) submitted by same author. (The committee reserves the right to combine such abstracts.)
11. Abstracts that report research that is confirmatory of previous studies and/or lacks originality will be given low priority for acceptance.

Deadlines and Notification Dates

- Abstract Submission Deadline: January 16, 2007.
- Submission Confirmations: Within 48 hours of submission.
- Acceptance/Rejection Notification: February 28, 2007.

Contact Information

Questions regarding abstract submission can be directed to Tamara P. Ford, 515.276.3344 or 800.369.6337; E-mail: tford@foodprotection.org

Program Chairperson

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

Call for Entrants in the Developing Scientist Awards Competitions

Supported by the International Association for Food Protection Foundation

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

Purpose

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

Presentation Format

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

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

General Information

1. Competition entrants cannot have graduated more than a year prior to the deadline for submitting abstracts.
2. Accredited universities or colleges must deal with environmental, food or dairy sanitation, protection or safety research.
3. The work must represent original research completed and presented by the entrant.
4. Entrants may enter only one paper in either the oral or poster competition.
5. All entrants must register for the Annual Meeting and assume responsibility for their own transportation, lodging, and registration fees.
6. Acceptance of your abstract for presentation is independent of acceptance as a competition finalist. Competition entrants who are chosen as finalists will be notified of their status by the chairperson by April 30, 2007.

7. Entrants who are full time students, with accepted abstracts will receive a complimentary, one-year Student Membership with *JFP Online*.
8. In addition to adhering to the instruction in the "Call for Abstracts," competition entrants must check the box to indicate if the paper is to be presented by a student in this competition. A copy of the abstract will be E-mailed to the major professor for final approval.
9. You must also specify full-time student or part-time student.

Judging Criteria

A panel of judges will evaluate abstracts and presentations. Selection of up to ten finalists for each competition will be based on evaluations of the abstracts and the scientific quality of the work. All entrants will be advised of the results by April 30, 2007. Only competition finalists will be judged at the Annual Meeting and will be eligible for the awards.

Judging criteria will be based on the following:

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

Finalists

Awards will be presented at the International Association for Food Protection Annual Meeting Awards Banquet to the top three presenters (first, second and third places) in both the oral and poster competitions.

All finalists are expected to be present at the banquet where the award winners will be announced and recognized.

Awards

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

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

Policy on Commercialism

for Annual Meeting Presentations

1. INTRODUCTION

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

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

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

2. TECHNICAL CONTENT OF SUBMISSIONS AND PRESENTATIONS

2.1 Original Work

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

2.2 Substantiating Data

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

sions that might be reasonably drawn from the data may be presented. Claims of benefit and/or technical conclusions not supported by the presented data are prohibited.

2.3 Trade Names

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

2.4 "Industry Practice" Statements

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

2.5 Ranking

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

2.6 Proprietary Information (See also 2.2.)

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

2.7 Capabilities

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

3. GRAPHICS

3.1 Purpose

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

3.2 Source

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

3.3 Company Identification

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

3.4 Copies

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

4. INTERPRETATION AND ENFORCEMENT

4.1 Distribution

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

4.2 Assessment Process

Reviewers of submissions and presentations will accept only those that comply with this policy. Drafts of submissions and presentations will be reviewed for commercialism concurrently by both staff and technical reviewers selected by the Program Committee chairperson. All reviewer comments shall be sent to and coordinated by either the Program Committee chairperson or the designated staff. If any submissions

are found to violate this policy, authors will be informed and invited to resubmit their materials in revised form before the designated deadline.

4.3 Author Awareness

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

4.4 Monitoring

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

4.5 Enforcement

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

4.6 Penalties

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



Membership in the International Association for Food Protection will put you in charge of your career. From quick access to cutting-edge technical and scientific information, becoming a Member is your link to the food safety industry and a clearinghouse of resources. Increase the knowledge and ideas you can implement in your work environment.

Is your organization in
pursuit of "Advancing
Food Safety Worldwide®"?
As a Sustaining Member
of the International
Association for Food
Protection, your
organization can help to
ensure the safety of the
world's food supply.

Sustaining Membership

Sustaining Membership provides organizations and corporations the opportunity to ally themselves with the International Association for Food Protection in pursuit of *Advancing Food Safety Worldwide*®. This partnership entitles companies to become Members of the leading food safety organization in the world while supporting various educational programs through the IAFP Foundation that might not otherwise be possible.

Organizations who lead the way in new technology and development join IAFP as Sustaining Members. Sustaining Members receive all the benefits of IAFP Membership, plus:

- Monthly listing of your organization in *Food Protection Trends* and *Journal of Food Protection*
- Discount on advertising
- Exhibit space discount at the Annual Meeting
- Organization name listed on the Association's Web site
- Link to your organization's Web site from the Association's Web site
- Alliance with the International Association for Food Protection

Gold Sustaining Membership \$5,000

- Designation of three individuals from within the organization to receive Memberships with full benefits
- \$750 exhibit booth discount at the IAFP Annual Meeting
- \$2,000 dedicated to speaker support for educational sessions at the Annual Meeting
- Company profile printed annually in *Food Protection Trends*

Silver Sustaining Membership \$2,500

- Designation of two individuals from within the organization to receive Memberships with full benefits
- \$500 exhibit booth discount at the IAFP Annual Meeting
- \$1,000 dedicated to speaker support for educational sessions at the Annual Meeting

Sustaining Membership \$750

- Designation of an individual from within the organization to receive a Membership with full benefits
- \$300 exhibit booth discount at the IAFP Annual Meeting





Award Nominations

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

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

Nominations deadline is March 12, 2007.

You may make multiple nominations. All nominations must be received at the IAFP office by **March 12, 2007**.

- ◆ Persons nominated for individual awards must be current IAFP Members. Black Pearl Award nominees must be companies employing current IAFP Members. GMA-FPA Food Safety Award nominees do not have to be IAFP Members.
- ◆ Previous award winners are not eligible for the same award.
- ◆ Executive Board Members and Awards Committee Members are not eligible for nomination.
- ◆ Presentation of awards will be during the Awards Banquet at IAFP 2007 – the Association's 94th Annual Meeting in Lake Buena Vista, Florida on July 11, 2007.

Nominations will be accepted for the following Awards:

Black Pearl Award

Award Showcasing the Black Pearl, *Sponsored by Wilbur Feagan and FEH Food Equipment Company*
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 Zep Manufacturing Co.*

Presented to an individual for many years of dedication and devotion to the Association ideals and its objectives.

Harold Barnum Industry Award

Plaque and \$1,500 Honorarium, *Sponsored by Nasco International, Inc.*

Presented to an individual for dedication and exceptional service to IAFP, 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.

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.

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.

International Leadership Award

Plaque, \$1,500 Honorarium and Reimbursement to attend IAFP 2007, *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.

Food Safety Innovation Award

Plaque and \$2,500 Honorarium, *Sponsored by 3M Microbiology*

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.

GMA-FPA Food Safety Award

Plaque and \$3,000 Honorarium, *Sponsored by GMA-FPA*

This Award alternates between individuals and groups or organizations. In 2007, the award will be presented to a individual in recognition of a long history of outstanding contributions to food safety research and education.



NEW MEMBERS

ARGENTINA

Eduardo D. Sanjurjo

Swift Armour S.A. Argentina
Buenos Aires

BRAZIL

Heitor Daguer

Federal University of Parana
Curitiba, Parana

Fabiola Franco

Gehaka
São Paulo

CANADA

Gary W. Baird

Canadian Food Inspection Agency
Kelowna, British Columbia

Stephen Bohrson

University of Saskatchewan
Calgary, Alberta

Pat Boswell

Weston Bakeries Limited
and Ready Bake Foods Inc.
Calgary, Alberta

Jim Bouch

Loblaw Brands Limited
Calgary, Alberta

Debra L. Bradshaw

Zep Food and Beverage Sanitation
Division
Mississauga, Ontario

Lynetta Chu

Safeway
Calgary, Alberta

John Crone

Zep Food and Beverage Sanitation
Division
Mississauga, Ontario

Paul Dick

Elanco Animal Health
Guelph, Ontario

Ambrose Fillis

AMFIL Technologies Inc.
London, Ontario

Alexander O. Gill

Health Canada
Ottawa, Ontario

Reza Hejazi

Canadian Food Inspection Agency
Calgary, Alberta

Sanja Ilic

Ippolito Fruit and Produce
Burlington, Ontario

Lynn Leger

DuPont
Mississauga, Ontario

Bruce Leitch

BioSecurity, Inc.
Vancouver, British Columbia

Bella Leong

Saputo
Calgary, Alberta

Barbara J. Marshall

Public Health Agency of Canada
Guelph, Ontario

W. Jon Meadus

Agriculture and Agri-Food Canada
Lacombe, Alberta

Gail Nicholson

Parmalat Canada R&D
London, Ontario

Vickie Nickerson

XL Beef
Calgary, Alberta

Michael O'Neill

Canadian Food Inspection Agency
Scarborough, Ontario

Greg M. Paoli

Decisionalysis Risk Consultants, Inc.
Ottawa, Ontario

Julian Sloman

Zep Food and Beverage Sanitation
Division
Mississauga, Ontario

Cordell Tanny

GMP Securities
Montreal, Quebec

George Tuan

Zep Manufacturing Co. of Canada
Delta, British Columbia

FINLAND

Ilari Antila

Raisio Diagnostics
Turku

JAPAN

Yohei Shinozaki

Kikkoman Corporation
Chiba

MALTA

Elfatah Elnifro

St. James Hospital Group
Sliema

MEXICO

Martha Elvia Diaz-Cinco

CIAD
Hermosillo, Sonora

NORTHERN IRELAND

Margaret F. Patterson

Agri-Food and Biosciences Institute
Belfast

NORWAY

Gro S. Johannessen

National Veterinary Institute
Oslo



NEW MEMBERS

SOUTH AFRICA

Jan FR Lues
Central University of Technology
Bloemfontein

SOUTH KOREA

Ce Jin Cha
Seoul National University
Gwanak-gu, Seoul

Sung Hee Choi
Korea Health Industry Development
Institute
Dongjack-Gu, Seoul

Yu-Kyong Goh
Chung-Ang University
Bucheon-si, Kyong-gi-do

Dong Jin Ha
Seoul National University
Gwanak-gu, Seoul

In-Sook Park
Korea Health Industry Development
Institute
Dongjack-Gu, Seoul

Won-Bo Shim
Gyeongsang National University
Jinju, Gyeongnam

UNITED STATES

CALIFORNIA

Damian DeAnda
Safeway
Pleasanton

Amber Donahue
Safeway
Pleasanton

Chuck R. Donaldson
Raley's
West Sacramento

Jorge Feldman
Safeway
Pleasanton

Matt Friedenberg
Gen-Probe
San Diego

Jeffrey Lewis
QMS Consulting Inc.
Mountain View

Matt Lowe
AMFIL Technologies, Inc.
Atascadero

Darcy MacPhedran
Safeway
Pleasanton

Mark A. Salimbene
Safeway
Walnut Creek

Cecil Sievwright
Nestle USA
Glendale

John Stegeman
Safeway
Pleasanton

Karen Tolley
Safeway
Pleasanton

DELAWARE

Timothy R. Dambaugh
DuPont
Wilmington

Matthew Knight
Strategic Diagnostics Inc.
Newark

DISTRICT OF COLUMBIA

Annamaria Castiglia
National Pork Producers Council
Washington

Marie E. Latulippe
ILSI North America
Washington

FLORIDA

Joanne M. Brown
State of Florida
Tallahassee

MARYLAND

Jeanette Simpson
Innovative Biosensors, Inc.
College Park

MASSACHUSETTS

Khalil S. Zadeh
Lupuck Laboratories, Inc.
Canton

Andrea Zanzotto
BioScale, Inc.
Cambridge

MISSOURI

Courtney Botkin
Mastertaste
Republic

Chad Wilkey
bioMérieux
Hazelwood

NEVADA

David McNinch
Washoe Co. District Health Dept.
Reno

NEW JERSEY

Joe Falkenstein
NJTC Venture Fund
Mount Laurel

Gina M. Reo
Quality Assurance Strategies, LLC
Princeton Junction

NORTH CAROLINA

Allan Mohess
bioMérieux
Durham

Zai Zakaria
Applied Biosystems
Charlotte

NORTH DAKOTA

James J. Sasanya
North Dakota State University
Fargo



NEW MEMBERS

OHIO

Greg Eppink
Applied Biosystems
Perrysburg

Mary K. Folk
Ohio State University
Columbus

Charles Pettigrew
Procter and Gamble
Mason

Marianne Potter
Nestle R&D Center, Inc.
Marysville

OKLAHOMA

Yale Lary, Jr.
Bar-S Foods Co.
Clinton

OREGON

Ken Yee
Multnomah County
Portland

PENNSYLVANIA

Thomas C. Ambrosia
HACCP.US
Benton

L. Scott Donnelly
Wyeth Pharmaceuticals
Collegeville

Raj Mutharasan
Drexel University
Philadelphia

TEXAS

April P. Shaw
US/FDA
McKinney

John H. Stumpf

Biological Research Service
Hewitt

WASHINGTON

David E. Kerr
BioControl Systems, Inc.
Bellevue

Sarah J. Mothershead
Welch's
Grandview

Charis R. Smallwood
SVZ-USA, Inc.
Othello

WISCONSIN

Jose A. Ramirez
JohnsonDiversey, Inc.
Sturtevant

UPDATES

Dr. Charles H. White Joins Randolph Associates, Inc.

Randolph Associates, Inc. (RAI) is pleased to announce that Dr. Charles H. White has joined the organization as senior consultant. Dr. White, who recently retired from Mississippi State University, has worked part time for Randolph Associates, Inc. since 1980.

Dr. White is a welcome addition to RAI, bringing a depth of experience in the areas of dairy technology and quality assurance. He served as the head of the department of food science and technology at Mississippi State University. Earlier, Dr. White served as corporate quality assurance director for Dean Foods. He received his B.S. and M.S. degrees in dairy microbiology from Mississippi State University and his Ph.D. in food microbiology from the University of Missouri.

Dr. White's areas of expertise lie in sensory evaluations/training, DMC training, quality assurance/laboratory training, HACCP development, and product improvement programs.

FKI Logistex Tim Fedrigon as Vice President, Human Resources

FKI Logistex announces the appointment of Tim Fedrigon as vice president, human resources of its North American operations. Mr. Fedrigon, who brings more than 22 years of corporate human resources experience to the company, reports to Steve Ackerman, president, FKI Logistex North America.

In his new role at FKI Logistex North America, Mr. Fedrigon will assume primary responsibility in developing the company's three North American human resources departments into a cohesive organization that evaluates and implements best practices.

Most recently, Mr. Fedrigon served as director, human resources for Cabot Corporation, a multinational specialty chemical manufacturing company, where he held positions of progressive responsibility since 1992. Prior to working at Cabot, he worked in human resources at the Ingersoll-Rand Company.

Mr. Fedrigon holds a bachelor of science in human resource management from Eastern Illinois University.

NETZSCH Fine Particle Technology Promotes Frank Warburg to National Sales Manager

NETZSCH Fine Particle Technology, LLC has promoted Frank Warburg to national sales manager, USA and Canada.

Mr. Warburg is responsible for growing the customer base throughout the United States and Canada for NETZSCH's grinding division. His primary objective is to improve customer relationships by creating and managing a knowledgeable sales force to provide technical solutions that enhance operations for NETZSCH customers.

Prior to his promotion, Mr. Warburg was central regional sales manager for NETZSCH's grinding and dispersion group for 9 years.

He successfully expanded NETZSCH's reach in that area by developing relationships with manufacturers of a wide range of products including paint, ink, pharmaceuticals, and ceramics. He won additional customers for NETZSCH with his comprehensive knowledge of processes for dry powder size reduction and classification for the mineral, toner, and ceramics industries, among others.

Previously, Mr. Warburg served as a manager of the controls group of Trane Company in Louisville, KY and subsequently was promoted to the position of sales engineer.

Mr. Warburg holds a bachelor of science degree in mechanical engineering from the University of Kentucky, Lexington, KY.

A&B Process Systems Announces New Design Team Lead Designer

A&B Process Systems announces the addition of Steve Voelz as lead designer for the mechanical design department.

Mr. Voelz's primary responsibility at A&B Process Systems will be developing mechanical design standards and utilizing state-of-the-art 3D CAD software. His responsibilities will also include process system and tank design.

Mr. Voelz has 22 years of design engineering experience which includes process modules and piping for the personal care, food and beverage, chemical, and pulp/paper industries.

Update on Feed Enforcement Activities to Limit the Spread of BSE

To help prevent the establishment and amplification of Bovine Spongiform Encephalopathy (BSE) through feed in the United States, FDA implemented a final rule that prohibits the use of most mammalian protein in feeds for ruminant animals. This rule, Title 21 Part 589.2000 of the Code of Federal Regulations, here called the Ruminant Feed Ban, became effective on August 4, 1997.

This is an update on FDA enforcement activities regarding the ruminant feed ban. FDA's CVM has assembled data from the inspections that have been conducted and whose final inspection report has been recorded in the FDA's inspection database as of August 5, 2006. As of August 5, 2006, FDA had received over 47,000 inspection reports. The majority of these inspections (around 68%) were conducted by state feed safety officials, with the remainder conducted by FDA officials.

Inspections conducted by FDA or state investigators are classified to reflect the compliance status at the time of the inspection based upon the objectionable conditions documented. These inspection conclusions are reported as Official Action Indicated (OAI), Voluntary Action Indicated (VAI), or No Action Indicated (NAI).

An OAI inspection classification occurs when significant objectionable conditions or practices were found and regulatory sanctions are warranted in order to address the establishment's lack of compliance

with the regulation. An example of an OAI inspection classification would be findings of manufacturing procedures insufficient to ensure that ruminant feed is not contaminated with prohibited material. Inspections classified with OAI violations will be promptly re-inspected following the regulatory sanctions to determine whether adequate corrective actions have been implemented.

A VAI inspection classification occurs when objectionable conditions or practices were found that do not meet the threshold of regulatory significance, but do warrant advisory actions to inform the establishment of findings that should be voluntarily corrected. Inspections classified with VAI violations are more technical violations of the Ruminant Feed Ban. These include provisions such as minor recordkeeping lapses and conditions involving non-ruminant feeds.

An NAI inspection classification occurs when no objectionable conditions or practices were found during the inspection or the significance of the documented objectionable conditions found does not justify further actions.

Food Microbiologist Recognized with Top Food Safety Achievement Award

US Department of Agriculture's Under Secretary for Food Safety Dr. Richard Raymond presented Dr. R. Bruce Tompkin with the prestigious 2006 Howard Bauman Award. Dr. Tompkin was recognized for his achievements in advancing and

applying the science of food safety during his 40-year career as a researcher and educator. The award was presented in Denver, CO, at the 2006 Food Safety Education Conference, Reaching At-Risk Audiences and Today's Other Food Safety Challenges.

"Dr. Tompkin has contributed enormously to food safety through his research into specific pathogens and to the control of foodborne illness by sharing that information widely," said Dr. Raymond. "Dr. Tompkin's lifelong dedication to science and education has contributed directly to the reduction of foodborne illness in America and it gives me great pleasure to honor such a deserving individual with the 2006 Howard Bauman Award."

The Bauman Award, the highest food safety honor presented by USDA, recognizes an individual who has exhibited leadership and a long-standing commitment to improving food safety.

Dr. Tompkin began his career as a food microbiologist with what is now ConAgra Foods in 1962 and retired as vice president of product safety in 2002. Some of his most significant research was on the control of microbiological hazards in meat and poultry products, including *Clostridium botulinum*, *Salmonella* and *Listeria monocytogenes*. His work on *Salmonella* control helped shape sampling protocols, methodology and controls still used today. Dr. Tompkin was an early proponent of the use of the Hazard Analysis Critical Control Point (HACCP) system, helping to implement it at ConAgra long before it was required. He also served as a trainer for industry, participated in HACCP workshops and numerous *Listeria*



control workshops. His commitment and leadership skills have benefited his peers in the food industry, regulatory agencies and most importantly, consumers.

The Bauman Award is named for Dr. Howard E. Bauman, widely recognized for his pioneering efforts to develop the HACCP food safety system. HACCP forms the backbone of the daily inspections that are performed by FSIS personnel every day at every federal meat and poultry establishment in America.

An Infectious Agent of Deception, Exposed through Proteomics

Salmonella bacteria, infamous for food poisoning that kills hundreds of thousands worldwide, infect by stealth. They slip unnoticed into and multiply inside macrophages, the very immune system cells the body relies on to seek and destroy invading microbes.

Just how *Salmonella* escapes detection by macrophages, turning predator cells to prey complicit in promoting infection, has seemed impossibly complicated, a needle-in-a-haystack proposition involving thousands of proteins, the building blocks that carry out cells' vital functions.

Applying the high-volume sorting and analytical power of proteomics—a detailed survey of microbial proteins present in the 24 hours that follow mouse-macrophage infection—a team led by Liang Shi of the Department of Energy's Pacific Northwest National Laboratory has turned up a suspect protein.

The discovery of the protein, dubbed STM3117, is detailed in *The Journal of Biological Chemistry*. Knocking out the gene that codes for STM3117, the researchers sub-

sequently crippled the microbe's ability to multiply inside macrophages. Shi and colleagues say the protein and two closely related proteins discovered in the study are similar in genetic sequence to those known to make and modify chemicals in the microbe's cell wall called peptidoglycan.

"Drug and vaccine designers armed with this mouse-model information can target chemicals or immune responses that disrupt peptidoglycan synthesis and other processes linked to *Salmonella*'s colonization of macrophages in humans," said Joshua Adkins, a co-author on Shi's paper and lead author of a related study in molecular and cellular proteomics. "A quick identification of these proteins," Adkins added, "could help physicians assess the virulence of a given strain."

The candidate proteins were winnowed from among 315 possibilities that emerged through a combination of techniques, culminating in measurements by Fourier-transform mass spectrometry, or FT-MS. A suite of FT-MS instruments customized by co-author and PNNL-based Battelle Fellow Richard D. Smith enabled the team to rapidly separate and identify many proteins at once even as macrophages were being infected.

Most of the initial candidates were designated "house-keeping" proteins, or those whose numbers relative to other proteins remained more or less constant during the course of infection. But 39 proteins shot up in number during bacterial colonization of macrophages, and of those, a handful or so—including STM3117—responded specifically to a macrophage protein associated with resistance to microbial infection. A standard assay called Western blot confirmed the abundance increases of that small group of proteins during infection.

Low Salmonella Levels on Farms

It would be a costly project if small hog farms tried to implement monitoring programs similar to those that large-scale operations use to monitor the prevalence of *Salmonella* among the livestock. The good news that Iowa State University researchers Isabel Harris and Matthew Erdmann found is that hogs on small farms already have little or no *Salmonella*.

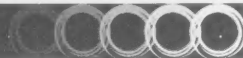
"These farms have very low levels of *Salmonella*," explained D.L. (Hank) Harris, an ISU food safety consortium researcher and animal science professor. "They're traditional farms that don't use antibiotics."

Harris' research group surveyed 50 traditional family farms in the Midwest ranging in size from 20 to 150 sows. The pigs there are raised on open lots using management procedures with varying risks of contributing to *Salmonella* on the premises.

The researchers found that practices such as maintaining small herd sizes, limiting the use of vaccines and refraining from using growth-promoting antibiotics did not translate into high prevalence of *Salmonella*. But those practices apparently don't have as much impact on keeping *Salmonella* levels low as do other practices such as the use of meal feed and straw bedding, low stocking densities or rodent control.

The lesson here, Harris noted, is that avoidance of antibiotics by itself isn't enough to keep *Salmonella* out. The other factors play more important roles. "It's a real plus for organic and traditional farming," he said.

"The difficulty comes in how they market their pigs. We know that they can get exposed to *Salmonella* on transport vehicles or when they're held before they're slaughtered. So here you've got this



organic farmer doing a good job raising pigs and being welfare-conscious. But when he takes them to market they could be contaminated with *Salmonella* depending on how that phase is done."

One farming practice that helps avoid *Salmonella* is the "all-in, all-out" procedure. Herds of hogs are kept together in one cohort in one facility, moved out as one group and then replaced by another group after the facility is cleaned. The segregation of the groups helps prevent infection from new animals. Only 42 percent of the small farms surveyed by the ISU researchers used the all-in, all-out procedure.

Harris explained that small farms generally don't use the procedure, which is more common among the large corporate producers. He estimated that a farm would need to produce about 6,000 pigs a year to make efficient use of all-in, all-out.

"It's difficult to do unless you're farrowing every week," he said. "Most of the small farmers are probably farrowing by batch and they may farrow only once every two or three months."

Biodegradable 'Napkin' Could Help Quickly Detect, Identify Biohazards

Detecting bacteria, viruses and other dangerous substances could soon

be as simple as wiping a napkin or paper towel across a table, according to Cornell University researchers. Once fully developed, the new absorbent wipe, embedded with nanofibers containing antibodies to numerous biohazards, could be used by virtually anyone to rapidly uncover pathogens in meat packing plants, hospitals, cruise ships, airplanes and other commonly contaminated areas, the researchers say.

The materials for this new process, which is still being tested in the laboratory, were described at the 232nd national meeting of the American Chemical Society, the world's largest scientific society.

"It's very inexpensive, it wouldn't require that someone be highly trained to use it, and it can be activated for whatever you want to find," said Margaret Frey, Ph.D., Lois and Mel Tukman assistant professor of textiles and apparel at Cornell. "So if you're working in a meat packing plant, for instance, you could swipe it across some hamburger and quickly and easily detect *E. coli* bacteria. If biohazards were detected, the area could be scoured and re-tested to confirm the contaminants were destroyed," she added.

In their experiments, Frey and her colleagues formed nanofibers with diameters between 100 nanometers and 2 microns (a human

hair is about 80,000 nanometers wide). On these nanofibers, the researchers created platforms made of biotin, a B-vitamin and the protein streptavidin to hold the antibodies. The nanofibers, which are made of polylactide (PLA) – a polymer compound made from corn – can be used to make non-woven wipers or swabs. To reduce costs, the nanofibers also could be incorporated into conventional paper products.

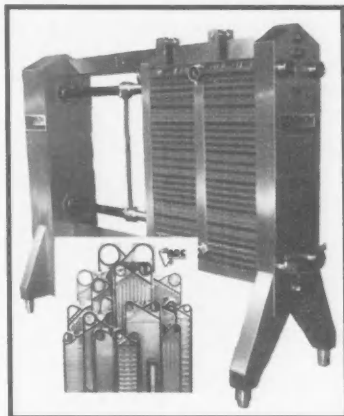
"The fabric basically acts as a sponge that you can use to dip in a liquid or wipe across a surface," Frey said. "As you do that, antibodies in the fabric are going to selectively latch onto whatever pathogen that they match. Using this method we should, in theory, be able to quickly activate the fabric to detect whatever is the hazard of the week, whether it is bird flu, mad cow disease or anthrax."

For now, identifying the collected pathogens requires a separate analytical step. But Frey and colleagues are working on methods, such as color changes in the fabric, which would instantly identify the contaminant.

"We're probably still a few years away from having this ready for the real world," Frey said, "but I really believe there is a place for this type of product that can be used by people with limited training to provide a fast indication of whether a biohazard is present."

www.foodprotection.org

INDUSTRY PRODUCTS



Ecolab Inc.

Ecolab Expands Exelerate Product Line with Debut of Exelerate HS

Ecolab Inc. has announced the introduction of Exelerate™ HS, a specialized, peroxyacid-acid based liquid pre-treatment designed to penetrate protein-based dairy soils and speed up the cleaning process for dairy pasteurizers and other heated process equipment. This new innovation is the latest in the highly-successful Exelerate line of products, which have been providing customers with superior results for over seven years.

"Exelerate HS quickly penetrates and pre-conditions stubborn protein soils on heated vessel walls making it easier to remove soil deposits in less time," explained John Tengwall, vice president of the food and beverage business unit at Ecolab. "And less time spent cleaning means more time up and running."

The new product also offers benefits to customers in both water and effluent surcharge savings. Because

Exelerate HS is a pre-treatment program, it replaces up to 30 percent of the alkaline detergent necessary for the wash cycle, which helps reduce effluent surcharge and neutralization costs.

"It's a performance-driven cleaning agent that can help keep your dairy processing plant clean and efficiently productive," Mr. Tengwall added. Exelerate HS's unique formula provides cleaner, shinier surfaces by removing the cooked-on protein soils, as well as fat and carbohydrates found in virtually all dairy processing plants. The product is non-corrosive to stainless steel and compatible with most sealing and gasket materials when used at recommended concentrations. A solution of Exelerate HS is applied prior to the caustic wash in regular circulation, spray and soak applications. The patent-pending, acidic pH and chelating agents work to ease soil release on hard-to-clean vessel and pipe walls by removing mineral scale. Exelerate HS is not for use as a hard food contact surface sanitizer.

Ecolab Inc.

651.293.2233

St. Paul, MN

www.ecolab.com

Bio-Rad's Rapid'E. coli 2™ Agar Granted Performance Tested Method Status by AOAC Research Institute

Rapid'E. coli 2 agar, manufactured by Bio-Rad Laboratories, was granted Performance Tested Method status by the AOAC Research Institute (certificate # 050601). Rapid'

E. coli 2 is a chromogenic medium for detection and enumeration of *E. coli* and other coliform bacteria in food in 24 hours. It is a rapid method producing accurate and easy-to-read results. Current methods for enumeration of *E. coli* and coliform bacteria can be costly and laborious. The use of chromogenic substrates in media has led to development of faster and easier methods for detection, differentiation and enumeration of target bacteria.

Rapid'E. coli 2 is validated for enumeration of *E. coli* and other coliform bacteria in raw ground beef, raw boneless pork, fermented sausage, processed ham, processed turkey, frozen turkey breast, raw ground chicken, cottage cheese, processed ricotta cheese, unpasteurized raw milk, and dry infant formula. It is validated at two incubation temperatures, 37°C and 44°C (cottage cheese and processed ricotta cheese are only validated at 37°C only).

The principle of Rapid'E. coli 2 medium relies on simultaneous detection of two enzymatic activities, Beta-D-Glucuronidase (GLUC) and Beta-D-Galactosidase (GAL). The medium contains two chromogenic substrates. One substrate is specific to GAL and results in blue green coloration of colonies positive for this enzyme and one substrate is specific to GLUC and results in violet coloration of colonies positive for this enzyme. Coliforms, other than *E. coli*, (GAL+/GLUC-) form blue to green colonies while, specifically, *E. coli* (GAL+/GLUC+) form violet colonies.

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A count of total coliforms can be obtained by adding the number of blue colonies and the number of violet colonies. Differentiation of coliforms and specifically *E. coli* is carried out by observing a simple color change reaction. Observation of gas bubbles for differentiation is not necessary.

BioRad Laboratories
800.424.6723
Hercules, CA
www.bio-rad.com



Columbus Instruments

Columbus Instruments' Room Environment Monitor

Columbus Instruments' room environment monitor is a device that monitors room environment during an experiment. A typical application allows the user to monitor room temperature, barometric pressure, and relative humidity in four locations. The room monitor can also be used to monitor humidity and temperature in a sample gas stream; useful for industrial or analytical applications. Audible alarms can be set for the humidity sensors to alarm the user about undesirable change in the environment. The room monitor can interface to PC by way of RS232. Direct Ethernet connection is also supported via built-in web server hard-

ware, making it a desirable monitor for any experiment where room conditions may impact the results of an experiment.

Columbus Instruments
614.276.0861
Columbus, OH
www.colinst.com

DuPont Qualicon Launches Real-Time PCR Assay for Detecting Three Species of *Campylobacter* in Poultry

DuPont Qualicon has released a new test for detecting *Campylobacter* in poultry that shortens PCR processing time and introduces quantified results by species. This new assay was designed specifically for the BAX[®] System Q7 instrument and takes advantage of powerful real-time PCR capabilities.

Using enhanced software and multiple probe technology, the BAX[®] System Q7 differentiates the presence of three species of harmful *Campylobacter* — *C. jejuni*, *C. coli* and *C. lari* — in a single test. Beyond detection, the system also determines concentration levels and reports the number of colony forming units per milliliter (CFU/mL) for each species in the sample.

Developed in alliance with Applied Biosystems, this BAX[®] System real-time PCR assay for *Campylobacter jejuni/coliformari* enables the Q7 instrument to detect target concentrations as low as 10⁴ CFU/mL, with or without a 24-hour enrichment period. Validated on ready-to-eat poultry and carcass rinses, the system can process up to 96 samples per batch in less than 90 minutes.

"Poultry processors now have a way to quickly find out if pathogenic *Campylobacter* are present in their products and at what levels," said Kevin Huttman, president of DuPont Qualicon. "Compared with waiting up to five days for culture results, this new BAX[®] system assay can significantly speed up product release decisions in the poultry industry."

Campylobacter infection is the leading bacterial cause of diarrheal illness in the United States, affecting about 2.4 million people each year. Ingesting even low doses (less than 500 cells) can cause *Campylobacteriosis*, with possible complications that include arthritis and Guillain-Barré syndrome. Infection is often a result of handling raw poultry or eating raw or undercooked poultry meat. Most cases of *Campylobacteriosis* are caused by one species, *C. jejuni*, but *C. coli* and *C. lari* are also associated with human illness.

DuPont Qualicon
302.695.5300
Wilmington, DE
www.qualicon.com

Nilfisk-Advance America Introduces Cost-effective New SL Vac Series

Manufacturing and industrial companies today face tough plant maintenance and cleaning needs coupled with a need to contain related cleaning costs. Nilfisk-Advance America is helping a range of industries meet those challenges with the launch of its newest line of industrial vacuum cleaners — the SL Vac series.

Designed to meet the twin concerns of cost and performance, the SL Vacs feature solid construction and

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INDUSTRY PRODUCTS

strong performance at an affordable price, making them a cost-effective solution for many companies. These vacuums simultaneously address the cleanliness standards of organizations and tackle the health and safety concerns of employees. And they effectively reduce the overall cost of cleaning through greater efficiency levels.

"Today's companies require cleaning products and equipment that conform as closely as possible to their very specific safety, hygiene, and cleanliness requirements, yet help them meet the bottom line," noted Paul Miller, vice president of Nilfisk-Advance America. "It is with these companies in mind that we are introducing the SL Vac series."

Lightweight and highly maneuverable, the SL Vacs feature rear swiveling wheels with locking brakes and a unique release lever, which lowers the wheeled collection container for fast and easy disposal of collected debris. The SL Vac series continues Nilfisk-Advance America's tradition of product excellence – combining attention to detail, careful ergonomic design, and the availability of a wide range of accessories.

Nilfisk-Advance America
610.647.6420
Malvern, PA
www.pa.nilfisk-advance.com

AccuFill™ Systems from Gainco Provide Accuracy and Efficiency, Along with Sanitary-friendly Design

Gainco's line of AccuFill™ weigh/bagging and table bagging systems incorporate a new "hygienic" design, deliver heightened accuracy, efficiency, sanitation and cost-saving performance. Completely engineered and built in the USA, these systems



Gainco, Inc.

are ideal for the full range of meat, poultry and seafood classifying, weighing and bagging applications, including chops, filets, drumsticks, tenders, wings, fish filets and shellfish products.

In contrast to conventional tubing designs for these systems, the special open-frame design of Gainco's AccuFill™ weigh/bagging and table bagging equipment promotes better food safety and ease of cleaning, making them perfectly suited for food processing environments. All AccuFill™ systems feature rugged, sanitary stainless steel construction for long-life performance. Specially-engineered angled edges and openings prevent washdown water and other fluids from collecting and hiding in crevices or other areas that can harbor bacteria growth – all while maintaining super-strong durability.

Beyond the clear benefits of better cleanliness and sanitation, numerous productivity-enhancing features of AccuFill™ weigh/bagging systems include the ability to accommodate each users' specific wicketed bag requirements, such as adjusting weight set-points and lower/upper limits. A "quick change" wicket holder faci-

tates the rapid reloading of bags, while a checkweighing feature guards against overpacking.

Versatile controllers provide easy flexibility in program setup and operation, and a battery-backed memory has been designed into the AccuFill™ system for recording the total number of bags, total weight, plus all setup parameters. Incorporating "auto-zero" software automatically adjusts for any product accumulation on the hopper surfaces to ensure better weighing accuracy.

AccuFill™ weigh/bagging systems are engineered to operate in a variety of configurations, such as manual loading with either automatic or operator-selected product discharge, or conveyor loading with either automatic or operator-selected discharge. Multiple system configurations are available, including dual-stage and quad systems used in conveyor-fed, high-volume product applications where varying customer requirements or floor space considerations are prime factors.

The special functionalities of AccuFill™ table bagging systems combine the functions of weighing, filling, bagging and quality control into one compact workstation. A continuous flow of product can be visually inspected and directed into the weigh hopper for precise weighing and bagging – all using just one operator. In addition to the labor savings resulting from combining several work functions into one efficient process, faster cycle times and increased throughput can be achieved. AccuFill™ table bagging systems can be customized to fit into many existing production lines.

Gainco, Inc.
800.467.2828
Gainesville, GA
www.gainco.com

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INDUSTRY PRODUCTS



Synoptics

Synoptics Develops New Instrument for IDEXX Laboratories

Synoptics has announced it has developed the Quanti-Disc™ reader, a new automated fluorescence plate-reading system, designed to help rapidly assess water quality, for major microbiological testing company, IDEXX Laboratories.

Synoptics has built on its expertise of developing industry leading Synbiosis automated colony counters to produce the Quanti-Disc reader, which will be marketed exclusively by IDEXX Laboratories. The reader automatically detects and reads fluorescence from the 50 wells of a Quanti-Disc in less than 10 seconds, making performing total viable counts with Quanti-Disc even quicker and simpler than traditional agar plating methods.

Adam Potter, associate product manager at IDEXX Laboratories, stated, "Since we launched Quanti-Disc last year, customers have said they would like to automate reading

the fluorescence in each well. Synoptics is known as a leader in the industry with the Synbiosis colony counters, which is why we approached Synoptics to be our partner in this exciting project."

"The Quanti-Disc Reader can accurately and objectively read 100 Quanti-Disc plates in just 15 minutes. This is less than half the time it takes most microbiologists to read the plates manually, and will be an excellent time-saving addition for Quanti-Disc users," Potter continued.

Synoptics

44(0) 1223.727123
Cambridge, UK
www.syngene.com

Hardy Diagnostics' New Gram Stain Kit

The gram reaction is essential for accurate bacterial identification. Hardy Diagnostics' new gram stain kit advanced features superior and improved reagents for better staining quality. The kit includes Advanced™ Crystal Violet, which is shown to consistently provide a superior, brighter staining of Gram-positive organisms, especially which decolorize easily. The advanced system helps to guard against over-decolorization and mistaking an organism for Gram-negative. It is especially useful when examining anaerobic bacteria, which have traditionally been difficult to stain. Additionally, the Advanced™ Safranin counterstain produces a deep red color and provides enhanced contrast between Gram-positive organisms in a mixed field. In addition, the outer

edges of Gram-negative bacteria appear more crisp and clearly defined. The Gram Stain kit – Advanced also comes with pre-mixed and ready-to-use Stabilized Iodine, which is less sensitive to light and has a longer shelf life than non-stabilized iodine. The kit also comes with the recommended fast decolorizer.

Hardy Diagnostics

800.266.2222
Santa Maria, CA
www.hardydiagnostics.com

AmeriVap Systems – Organic Cleaning at Its Best

One step dry steam cleaning and sanitizing systems – X treme steam, 220° – 365°F, known as 95% dry steam (only 5% moisture), cleans and sanitizes thoroughly even in difficult places to reach on equipment, production lines, packaging lines and working environments. For wrappers, conveyors-chains, belts, sprockets, scales, sensors, refrigeration systems, electrical panels, circuit boards, gaskets, slicers, dicers, etc. No need for toxic cleaning and disinfectant agents. Uses only quarts per hour, not gallons per minutes. This technology is clean, economical, but most of all eco-friendly. Portable, self-contained. New automatic conveyor belt cleaners powered by the X treme steam generator.

AmeriVap Systems

800.763.7687
Atlanta, GA
www.amerivap.com

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COMING EVENTS

NOVEMBER

- **30-Dec. 1, IAFP's Second European Symposium on Food Safety, "Innovations in Food Safety Management,"** Fira Palace Hotel, Barcelona, Spain. For more information, contact IAFP at 800.369.6337; E-mail: info@foodprotection.org.

DECEMBER

- **4-6, HTST Training Seminar, Randolph Associates, Inc.,** Murfreesboro, TN. For more information, call 205.595.6455; E-mail: HERConsulting@aol.com.

- **4-8, Diploma in Food Hygiene and Safety,** Guelph Food Technology Centre, Guelph, Ontario, Canada. For more information, call 519.821.1246 or go to www.gftc.ca.
- **11-13, Pflug's Microbiology and Engineering Course,** Valley Forge Scanticon Hotel and Conference Center, King of Prussia, PA. For more information, phone/fax: 434.263.4950; E-mail: pflug001@umn.edu.

JANUARY

- **21-24, NMC 46th Annual Meeting,** Marriott Riverwalk, San Antonio, TX. For more information, call 608.848.4615; E-mail: nmc@nmconline.org.

- **24-26, International Poultry Expo and International Feed Expo,** Georgia World Congress Center, Atlanta, GA. For more information, call 770.493.9401 or go to www.ipe07.org.

FEBRUARY

- **24-28, AFFI Frozen Food Convention,** Monterey, CA. For more information, call AFFI at 703.821.0770; E-mail: affi-con@affi.com.

MARCH

- **20-23, ISOPOL XVI,** Marriott Riverfront Hotel, Savannah, GA. For more information, contact Terry Reamer at 240.485.2776; E-mail: terry.reamer@aphl.org.

IAFP UPCOMING MEETINGS

JULY 8-11, 2007
Lake Buena Vista, Florida

AUGUST 3-6, 2008
Columbus, Ohio

JULY 12-15, 2009
Grapevine, Texas

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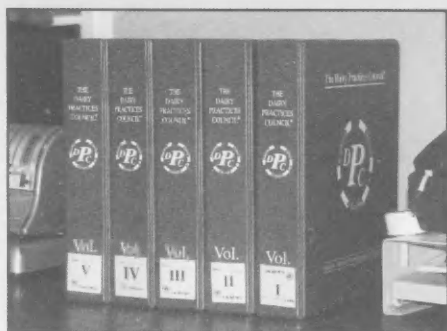
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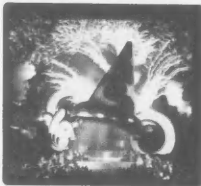
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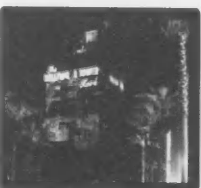
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Lake Buena Vista, Florida



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