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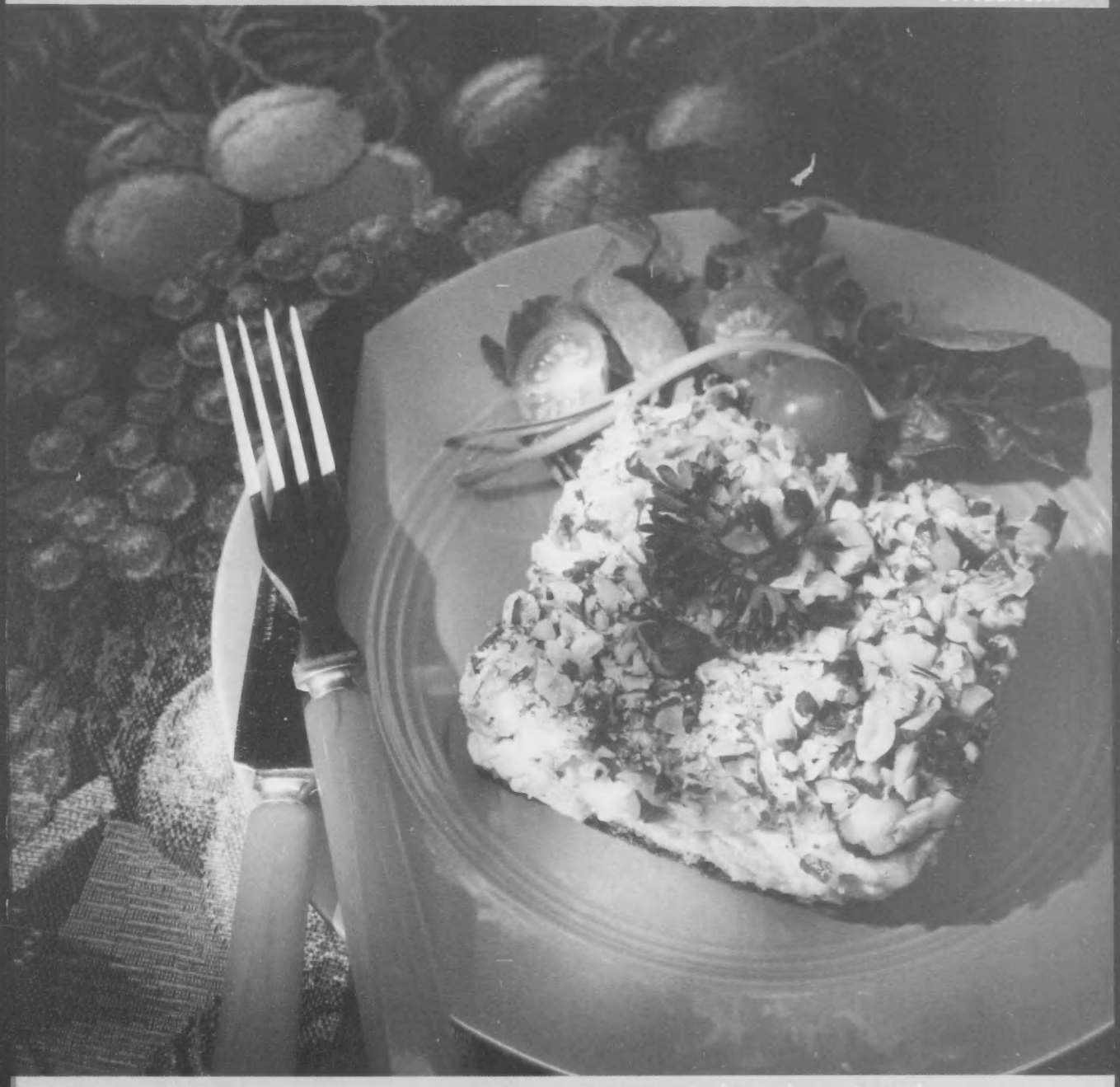
FOOD PROTECTION TRENDS

SCIENCE AND NEWS FROM THE INTERNATIONAL ASSOCIATION FOR FOOD PROTECTION

OCTOBER 2007



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VOLUME 27, NO. 10

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FOOD PROTECTION TRENDS
SCIENCE AND NEWS FROM THE INTERNATIONAL ASSOCIATION FOR FOOD PROTECTION

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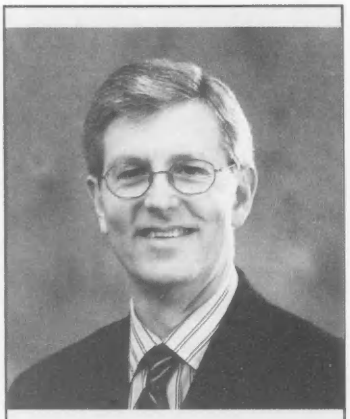


By **GARY ACUFF**
PRESIDENT

"We need to be careful to balance science and risk with public perception"

Food safety issues have been getting their share of attention in the news lately. We experienced more botulism outbreaks than usual last summer, and *Escherichia coli* O157:H7 was a common issue that certainly grabbed the newspaper headlines. Concerns regarding the safety of food imports from China have even been voiced by hopeful candidates in the US presidential election primaries. Everybody seems to be talking about food safety, but not everyone is on the same page. Take raw milk, for example. That would seem to be a simple, straightforward food safety topic. Raw milk can contain enteric pathogens that cause foodborne illness, so it should be pasteurized to assure safety. Apparently, however, that is not apparent to all, evidenced by the following excerpts from statements I have seen recently in newspapers.

- *...the laws against raw milk date back to 1938, when refrigeration and testing were not as sophisticated.*
- *Before drinking only real milk, my children suffered from seasonal allergies, but since introducing raw milk into our diets there have been no allergy symptoms.*
- *If raw milk is so deadly why didn't all humans die long ago? With today's stainless steel equipment, quick refrigeration, proper hygiene and latest testing, there remains no reason to pasteurize.*
- *The claim that raw milk is linked to* Salmonella *is a hoax. A 1985 outbreak caused 14,000 to become sick and at least one death all because there was a resistant strain of* Salmonella *in the pasteurized milk.*

If you are anything like me, you now have an overwhelming inclination to correct the authors of the statements above and set the record straight—using science, of course. Obviously, their risk assessment wiring is out of whack and just needs a little dose of logic and science to get straightened out, right? All of us have dabbled in risk assessment and management to some extent in our day to day existence, even if unknowingly. From a professional perspective, we know that hazards are to be addressed based upon severity and likelihood of occurrence. However, in order for this to be effective, our risk management must be driven by rock-solid science. If our severity and occurrence data is flawed or incomplete, the inaccuracy of our risk management attempts will be magnified to an even greater level. Reliance on science makes perfect sense to us; however, it is imperative that the public, or the consumer, also has confidence in the system.

Historically, the consuming public has demonstrated a love-hate relationship with science. It should be stated up front that a microbiologist presenting history is fraught with potential problems, yet history plays an operative role in the way we evaluate food safety today, so bear with me, as I think this has an impact. From around 30 to 1650 AD, the world believed strongly in the power of the supernatural on human life in terms of safety and security. From 1650–1780, during the Enlightenment, understanding of science began to displace belief in the supernatural, and people even started to profess a distaste for that which could not be explained by science. I believe that thought process peaked during the Space Age from 1957–1986. Many of us grew up during this time period and

we all remember how science was held in great reverence. Astronauts were some of my greatest heroes—I even had a Mercury Space Program lunch box in first grade. Science could do no wrong. In the present age, however, science has developed a credibility problem. The public has been hit pretty hard with what the news media portrays as science gone bad—pesticides, shuttle disasters, Mad Cow Disease, and genetically modified organisms.

There is currently a trend against science in some circles. The public has experienced a fall-back to comfortable beliefs not necessarily supported by science. Remember the statements supporting the consumption of raw milk earlier? This developing situation creates a great challenge for us as we attempt to convince consumers that science and risk-based systems are the answer to our problems.

For instance, US meat and poultry processing has been historically subject to continuous regulatory inspection, and few would deny that the continuous inspection system is very inefficient and unfocused. Many would say that inspection policy is not in agreement with science and, in fact, is likely a great waste of resources. However, the consuming public has confidence in this system, warranted or not, because it has a comfortable history. On the other hand, risk-based inspection makes more sense, but change is discomforting. Risk analysis focuses our efforts on significant hazards, so resources are not wasted. Risk-based systems are based on science, and we are all convinced of the validity of making decisions based on science, yet the consumer may not be comfortable with this type of system due to a lack of history. In these "modern" times, scientific reasoning may not bolster consumer confidence as it did when many of us were growing up.

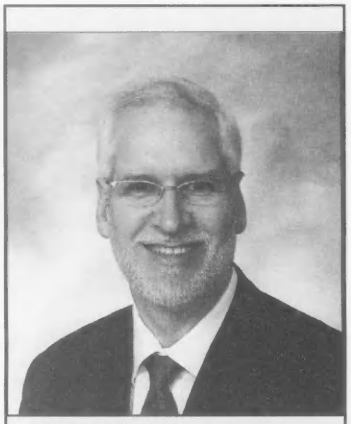
As we approach the implementation of progressive, scientifically supported steps for consumer protection, we need to be careful to balance science and risk with public perception. It is difficult to know how to proceed in such transitional times, but here are a few things that I believe are guaranteed not to work...

1. Tell the consumer that science is the only answer.
2. Promote the myth that we can achieve a "zero risk" food supply.
3. Just throw up our hands and admit that the public is incapable of understanding.
4. Throw facts and data at the consumer until they are forced into an unavoidable logical and compliant opinion.

We, as proponents of science, have to present a focused position. It has to be firmly based in science, but it has to be sensitive to public perception—and that is not always an easy task. Actually, we probably need to do a risk assessment on how we should respond. We need to conduct a risk assessment on what we are proposing. If our response to the public health threats of the future is going to be effective and accepted, it will depend upon presenting a risk-based approach that utilizes data from multiple sources and balances science with consumer concerns.

As always, I would love to hear from you (gacuff@tamu.edu) with your thoughts about how IAFP can continue to advance food safety worldwide.

"COMMENTARY"
FROM THE EXECUTIVE DIRECTOR



By DAVID W. THARP, CAE
EXECUTIVE DIRECTOR

"Never before has the Association undertaken so many events designed to bring food safety professionals together in forums to discuss methods to protect the world's food supply"

This month's issue of *Food Protection Trends* includes our review and recap of IAFP 2007 that was held July 8–11 at Walt Disney World in Lake Buena Vista, Florida. In addition to some comments about IAFP 2007, I want to cover a few other topics including: the Rome Symposium, a China Conference and electronic Secretary elections. So let's start off with IAFP 2007!

There were so many special elements to IAFP 2007, it is hard to know where to begin. The venue itself was so much fun; being at the Contemporary Resort just outside of the Magic Kingdom led to excitement each day! Every day ended with fireworks over the Magic Kingdom and began with sunrise over beautiful Bay Lake. Our Opening Session began with a little magic of its own. Mickey and Minnie were on stage to welcome everyone to Walt Disney World. Mickey performed a few tricks with a final magic trick where Mickey disappeared and Frank Yiannas magically appeared in his place! This met with the audience's approval and even Minnie was impressed.

In the Exhibit Hall after the Opening Session, Mickey reappeared along with Minnie for photo opportunities. There were a number of "odd" characters in the Exhibit Hall to entertain everyone. What a memorable beginning to IAFP 2007.

Beginning on page 757, there are a number of photos to help you relive IAFP 2007. For those unable to be with us this year, the pictures will provide a sense of excitement that prevailed at Walt Disney World. You may also review the session summaries provided by IAFP's Student PDG monitors. Each year for the last several, the Student PDG has provided assistants for each of the session rooms to help with audiovisual needs and to assist the convenors. In addition, we ask that they provide a written summary of the session for publication in this issue. Those summaries begin on page 790. We thank the Student PDG for organizing this valuable service to IAFP 2007 and we thank each of the students who participated this year.

As you know, we rely on our exhibitors and sponsors to support our Annual Meeting. Their participation allows us to offer much more to our attendees than would be possible at our low registration rates. This year again, we provided lunch in the Exhibit Hall on Monday and Tuesday along with an end-of-day reception on both days. These events are directly sponsored along with a number of other events that really help the Association to provide a first-class experience for our attendees.

Speaking of attendees, this year we not only surpassed 2,000, but we topped 2,100 for a total attendance of 2,126! Our previous high was 1,774 in 2005 at Baltimore. So, we increased by 352 over that record or in other words, we had a 20% increase in attendance. It is interesting that our international attendance has increased over prior years to now be 16% of our total attendance. North American attendance was at 84% which includes 6% from Canada.

We look forward to continuing our international growth in attendance and feel that our international symposia in Europe have helped spread the word about IAFP. That brings me to another topic, IAFP's Third European Symposium on Food

Safety to be held October 18–19 in Rome, Italy. We have seen excellent support from IAFP's corporate community and look forward to excellent sessions later this month.

Another new venture for IAFP took place in September in China. Along with World Services, IAFP assisted in identifying speakers and topic content. As I am writing this column just prior to the China International Food Safety & Quality Conference (CIFSQ), I cannot report on specifics, but we expect great interest in IAFP and our journals. Watch next month's column for more details.

The last topic I want to touch on is our next Secretary election. We will conduct this election electronically via E-mail and online voting. The details are being worked out, but it is expected that you will receive an E-mail during the first week of February with a link to the voting site. In the E-mail, you will receive a unique password to allow you to place your vote. The election will remain open for six weeks at which time the service agency will report directly to IAFP's teller. This year, for those not having E-mail access, we will have an alternate means to complete your ballot. In future years, all voting will take place online.

This completes the items for October. It continues to be an exciting time for Members of IAFP. Never before has the Association undertaken so many events designed to bring food safety professionals together in forums to discuss methods to protect the world's food supply! We look forward to continuing our work and involving more food safety professionals as we grow.

ARTICLES

Food Protection Trends, Vol. 27, No. 10, Pages 744–748

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International Association for Food Protection

Effect of an Educational Program on Attitudes of California Consumers Toward Food Irradiation

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SUMMARY

The risk of foodborne illness can be reduced significantly by irradiation of ground beef and poultry. Response to irradiated food among California consumers was measured after opponents to the process had been active in the state legislature. Three-hundred consumers participated in an educational program consisting of viewing an eight-minute video on food safety and irradiation followed by a question-and-answer period. Consumers were surveyed about their general knowledge and attitudes toward food safety and irradiation before and after participating in the program.

This program increased awareness of harmful bacteria and the risk of foodborne illnesses. Despite attention to irradiation in the legislature, over half of the respondents had not heard of it prior to the program, and those against irradiation reported that they knew little about it. This indicates that the initial negative attitudes may be due to lack of information. After the program, only 3% opposed offering irradiated food in the supermarket, over 60% stated that they would choose irradiated products, and almost 40% said that they would pay 10% more for irradiated meat. Although the video tape provided important information, people wanted details as to how the FDA assessed safety and the nutritional value of irradiated food.

INTRODUCTION

Non-conventional technologies, such as food irradiation, high-pressure processing, pulse electric fields, ohmic heating, and others, have been developed to enable processors to meet consumer demands for convenient, safe, healthful, and high-quality products *(4)*. A pasteurization treatment, such as that obtained when meats or poultry are irradiated at a level sufficient to obtain a 5-log reduction of common pathogens, can significantly reduce illness and death from foodborne illness *(17)*.

More consumers express concerns about microbial safety and chemical residues than about irradiation *(3, 9)*. Consumer interest in the safety benefits of irradiated meat has increased from 38% in 2000 to 53% in 2002, and 57% in 2004 *(14, 15)*. Johnson et al. *(9)* documented a shift in consumer attitudes from 1993 to 2003. Consumers expressed only slight concern about irradiation in 1993, 2.8 based on a 5-point scale, a concern that decreased in 2004 to 2.4, while concern about microbial safety and pesticides remained unchanged during that time period. Interest in purchasing irradiated

A peer-reviewed article

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TABLE 1. Mean level of concern towards harmful bacteria and foodborne illness (N=300)

Concerns towards:	Mean level of concerns*	Significance Level
Harmful bacteria		
Before	1.40	0.031
After	1.34	
Foodborne Illness		
Before	1.58	
After	1.42	0.000

*1 = very concerned; 2 = somewhat concerned; 3 = not concerned

TABLE 2. Self-reported knowledge about food irradiation (N=300)

Knowledge level	How knowledgeable are you about food irradiation? (%)
Little to none	70
Some	28
A lot	2

meat also increased. Approximately 76% and 68% of consumers indicated they were willing to buy irradiated meat/poultry and pork in 2003, compared to 69% and 29% in 1993. The benefit of irradiation appears to have been acted upon by some consumers. When a nationwide survey asked participants what they were doing for health purposes, 4% of consumers volunteered that they were selecting irradiated meat *(3)*. This is an astounding number, considering the limited market availability of this product.

A survey conducted for the Foodborne Disease Active Surveillance Network found that about half of the consumers at FoodNet sites said they would buy irradiated ground beef or chicken, and a fourth would pay a premium *(8)*. Attitude surveys and simulated market trials associated with educational programs report acceptance levels for irradiated meat and poultry at 70% to 90% or more (*1, 5-7, 11, 12, 20*). A 2003 study conducted in Texas found that 70–90% expressed a willingness to pay more for irradiated products *(1)*. Actual marketplace behavior has supported the idea of increased acceptance of labeled irradiated meat and fruit *(2, 10, 18)*. Supermarkets in the Midwest and East have successfully marketed ground beef in recent years. However, the availability of irradiated products is limited, and lay consumers are not widely informed about the process technology.

Because some consumers know little about this technology, they may be misled by inaccurate or incomplete information received from special interest organizations. Opponents to irradiation were active in the state, lobbying the state legislature and sending to school board members and others information that described irradiation as dangerous *(19)*. The purpose of this research project was to assess familiarity with irradiation among California consumers and evaluate the effect of an educational intervention that used a video tape and discussion on consumer attitudes toward the availability of irradiated meat and produce in the supermarket.

METHODS

Three-hundred California consumers participated in a program that consisted of viewing an eight-minute video, "Food Irradiation: Behind the Headlines", produced by Purdue University *(13)*, followed by a question-and-answer period. Educational programs were conducted in 2004 in Carmichael, Vacaville, Auburn, Roseville, Placerville, Sacramento, Woodland, and San Bernardino, CA. The targeted participants were those who make food purchases for the households, including parents with young children, college students, individuals who participated in food safety or nutrition programs, and seniors. Diversity in age and ethnicity was sought to represent the diverse California food purchasers. Volunteers were informed that their organization would receive a small financial contribution for each completed survey.

For the convenience of volunteers, this educational program was conducted at the groups meeting site. At most sessions, at least two of the three authors were present. At the beginning of the session, the study was described; then the research subject Bill of Rights and research subject consent form were read aloud to the volunteers. Volunteers signed the consent forms before the survey and the educational program began. All procedures for University of California human subject research were followed.

A three-page questionnaire was constructed to measure awareness of harmful microorganisms and risks of foodborne illnesses, knowledge and attitude toward food irradiation and irradiated products, attitudes toward the educational video, and general demographic information. The questionnaire was administered before and after participating in the program to measure the short-term impact of this program. Participants were encouraged to respond on the basis of their personal view and told that there were no right or wrong answers. The data were analyzed, using SPSS program version 11 *(16)*.

All sessions followed the same format: filling out the first page of questionnaire, which included general questions

TABLE 3. Attitude toward the availability of irradiated foods in the supermarket prior to and after participating in the educational program (N=300)

Level of support	Before %	After %
Strongly support	7	36
Support	15	44
Neutral	70	13
Oppose	4	3
Strongly oppose	4	4

TABLE 4. Belief that irradiation is an effective method of killing bacteria after participating in the educational program (N=300)

	An effective method of killing bacteria
Level of support	After
Strongly support	33.3
Support	50.3
Neutral	10.3
Oppose	4.3
Strongly oppose	1.7

on participant knowledge and attitudes toward food safety and food irradiation, viewing the eight-minute educational video, discussing questions about irradiation, and finally completing the questionnaire. If no questions were asked after the video, the moderator would initiate the discussion with questions such as, "How do you feel about the video?", "What do you think about irradiation?", or "How do you think irradiation will affect food safety?" These questions sparked discussion and encouraged participants to share their questions and opinions. The discussion continued for 15–30 minutes, until no more questions were asked. In total, the sessions lasted between 30 and 50 minutes. Sessions were not audio recorded; however, researchers wrote down the type of questions asked and comments offered.

RESULTS

A total of 300 respondents completed surveys on food irradiation; 72% were females. The age of volunteers ranged from 18 to 80 years old. Most participants were non-Hispanic Whites (66.7%), and the rest were Hispanic Whites (11.3%), Asian (7.3%), Native-American (3.3%), African-American (2.3%), and 9% who described themselves as 'others'. Gender and ethnicity did not significantly differ for any of the attitudinal factors measured.

Participating in the educational program significantly increased consumers' concerns about the presence of harmful bacteria and foodborne illnesses (Table 1). The percentage of respondents reported to be 'very concerned' about harmful bacteria rose from 64% before the program to 69% after the program, and those "very concerned" about foodborne illnesses rose from 54% prior to the program to 64% after the program.

Although 49% of respondents had heard of food irradiation, most (70%) reported that they had little or no knowledge about the process (Table 2). Prior to the educational program, slightly over 22% of respondents were supportive, 70% indicated a neutral attitude toward food irradiation, and 8% were opposed to it (Table 3). After participating in the program, over 80% of respondents agreed with the statement that irradiation is an effective method to destroy harmful bacteria in food and supported the availability of irradiated food at the supermarket (Table 4). Only 6% did not want irradiated products available in the supermarket.

Intent to purchase irradiated meat and fruits increased significantly as a result of participating in the program (Table 5). Initially, 13% of participants said they would buy irradiated fruit, while after participating in the program, 59% said they would purchase it. This response reflects interest in high quality tropical fruits or extended freshness of perishables such as strawberries. The potential for enhanced microbiological safety of produce through irradiation was not discussed. Interest in the food safety benefit of irradiation was measured in the response to irradiated meat. Initially only 18% of the respondents indicated that they would buy irradiated meat products, while after the program, 64% said they would buy these products. Furthermore, 36% of total respondents specified that they would be willing to pay a 10% premium for irradiated meat.

Almost 70% of the participants concurred that information on food irradiation is not yet widely available. Respondents endorsed using several sources for food safety and food irradiation (Table 6). The most preferred sources are community education programs (84%), TV news (79%), the supermarket (79%) and food/cooking magazines (75%).

Consumer perspectives on the educational video

The educational video was well received by most participants, with almost 60% believing that the information presented is based mostly on facts (Table 7). A few participants wanted to hear disad-

TABLE 5. Mean level of purchase intent of irradiated meat and fruit after participating in an educational program (N=300)

Purchase intent for:	Mean level of concerns*	Significance Level
Irradiated meat		
Before	1.97	0.000
After	1.48	
Irradiated fruit		
Before	2.03	
After	1.57	0.000

*1 = very likely; 2 = somewhat likely; 3 = not likely

TABLE 6. Consumer preferences for sources of information on food irradiation (N=300)

	Comm. ed. program	TV news	Supermarket	Food/cooking magazine	TV cooking shows	Consumer magazines	The Web	Radio	Friends
Prefer	84	79	79	75	71	69	66	66	56

TABLE 7. Attitude of consumers toward the information received from the educational video tape (N=300)

	Percentage of responses
Mostly facts	59
Some facts, some opinions	33
Few facts, lots of opinions	2
Almost no facts, mostly opinion	1
Don't know	5

vantages of the process, and therefore felt the video was somewhat one-sided.

Although the video provided information on food safety and foodborne illness, questions were raised about the Food and Drug Administration regulatory process and the effect of irradiation on food safety and nutritional value. Some wanted to know what approach the FDA used to evaluate safety. Respondents also asked if irradiation created free-radical or radioactive residues or toxins that could increase susceptibility to cancer. Some asked how the process was controlled in the irradiation facility and what agency provided oversight. Others asked if irradiation was an effective strategy to increase the safety of lightly cooked products. The program stimulated discussion on how to better practice safe handling in order to avoid cross contamination of foods.

DISCUSSION

The educational program appeared to promote awareness of the presence of harmful bacteria and the potential risks of foodborne illnesses. Initially, most consumers were already concerned, but after seeing the video and participating in the discussion, concern increased significantly. This video encouraged consumers to practice safe-food handling and to pay closer attention to the food they buy, prepare, and consume.

Many participants expressed the belief that irradiation sounded like radiation and could easily be misunderstood. One person declared, "Irradiation has a very lousy connotation on people's minds."Another suggested that the word 'irradiation' should be replaced with another term that clearly communicates to the public that irradiation is equivalent to modern-day pasteurization. Several agreed that using "pasteurization" to explain the irradiation process was a good idea.

Those who initially opposed the irradiation process classified their knowledge of irradiation as 'little to no knowledge' or 'some knowledge.' This suggests that among some people, opposition to irradiation may be due to lack of information or misperception generated by the term "irradiation." After the program, from 6% to 8% of respondents remained opposed to the technology. This result suggested that providing science-based information about irradiation increases acceptance among most consumers.

The majority of respondents would choose irradiated products over non-irradiated products, in contrast to only 18% who would buy prior to the program. Almost 40% of the respondents even stated that they would pay extra for irradiated meat. This confirms that the educational video increased consumer recognition of the value of the technology and clarified the questions some consumers might have prior to the program.

This study confirms the hypothesis that a clear understanding of the effects of irradiation on food quality and safety, as well as on the environment and on people, will increase consumer acceptance. Making consumers aware that scientific and health groups endorse the safety of irradiated products further enhances trust.

Because most participants had little knowledge of irradiation, it was relatively easy to deliver the message that irradiation is beneficial. While this educational program did not include information from those opposed to the process, concerns raised by opponents were discussed by the authors if not mentioned by participants. The video tape or subsequent discussion should describe the safety data FDA requires prior to approval and includes the effect of irradiation on nutritional value.

CONCLUSION

Sharing information about topics and issues the consumers find important is likely to increase consumer acceptance of new processing technologies. The name of the process technology and the perceived effect of the process on quality, safety, and the environment are the major factors that impact consumer responses. Most consumers were neutral toward irradiation initially, and some were opposed to the process. After receiving accurate and credible information on irradiation and food safety, consumers were significantly more accepting of the value of this technology to enhance safety. A majority indicated they would purchase irradiated products if these were available in the market. This response indicates that most consumers are neutral or undecided about this technology. People are open to information about the process. When provided with accurate, supportive information, most people accept that irradiated foods are wholesome and offer benefits.

Consumers sought an explanation on how the technology works, how it enhances safety and maintain nutritional values, and what procedures are used to verify safety. Irradiated food is currently in the market in several states. Supermarket executives reluctant to offer the choice of irradiated meat may consider contacting state food safety educators for assistance in reaching the public. The video tape from Purdue University, "Food Irradiation: Behind the Headlines," supplemented with a discussion responsive to consumer questions, effectively lays the groundwork for an informed public and could increase the selection of safety-enhanced irradiated products.

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Effect of Electron Beam Irradiation on the Safety of Diced Chicken Meat and Turkey Frankfurters

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SUMMARY

Post-processing contamination of ready-to-eat meats with *Listeria monocytogenes* is a major concern of the processed food industry. This study was undertaken to determine the effectiveness of electron (e) beam irradiation in inactivation of *L. monocytogenes* and control of the safety of ready-to eat meats. Diced chicken meat and turkey frankfurters were inoculated with a six-strain mixture of *L. monocytogenes* at ca. 10^2 and 10^4 CFU/g, respectively. The inoculated meats were vacuum-packaged and irradiated with 0, 1.0, 2.0, or 3.0 kGy of e beam. The populations of *L. monocytogenes* as well as psychrotrophic and total aerobic bacteria on diced chicken meat and turkey frankfurters were determined twice a week during a 4-week storage period at 4°C. The results indicated that 3 kGy was the only dose of e beam that was effective in eliminating 10^2 CFU/g of *L. monocytogenes* on both types of ready-to-eat meats and total aerobic bacteria on turkey frankfurters. However, the same treatment failed to control 10^4 CFU/g of *L. monocytogenes* on both meats, psychrotrophs on both meats, and total aerobic bacteria on diced chicken. An incremental trend was observed in the populations of surviving *L. monocytogenes* as well as psychrotrophic and total aerobic bacteria during the 4-week storage period. The results suggest that e beam irradiation at 3 kGy can be used to control the safety of ready-to-eat meats. However, it is crucial that the irradiated meat products be handled appropriately in order to maintain the safety of the products ensured by the irradiation treatment. The dependability of e beam irradiation for achieving a high level of bacterial reduction, especially a high level of psychrotrophic bacterial reduction needs to be further investigated.

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INTRODUCTION

Irradiation is an alternative approach to thermal processing for the control of pathogenic and spoilage microorganisms in food. During the irradiation process, bacterial cells in a food product are exposed to a controlled source of radiation, and the energies of the radiation rays create transient reactive chemicals known as free radicals. These chemicals cause damage to bacterial nucleic acids including the production of cross linkages that make the cells unable to replicate and eventually cause them to die *(13)*.

The use of irradiation to improve the safety of meat and poultry has received a considerable amount of attention since the US Food and Drug Administration (FDA) approved the use of 0.3–1.0 kGy of irradiation for the control of *Trichinella spiralis* in pork in 1985 *(16)*. Since that time, the agency has permitted the use of up to 3.0 kGy of irradiation for the control of *Salmonella* in poultry in 1986 *(17, 18)*, and the use of 4.5 kGy of irradiation for the control of bacterial pathogens in red meat (not including processed ready-to-eat meats) in 1997. At approximately the same time, the United States Department of Agriculture (USDA) approved the use of 1.5 – 3.0 kGy and 4.5 kGy of irradiation for the control of bacterial pathogens in poultry and meat, respectively *(2)*.

The two most commonly used forms of irradiation are gamma rays ($Cobalt^{60}$) and electron (*e*) beams. Gamma rays are high energy rays that can penetrate deep into a food product *(10, 13)*. Whereas the *e* beam is a stream of high-energy electrons (up to 10 MeV) that can penetrate only 2 to 4 inches into a food product *(10, 13)*. The *e* beam irradiation offers several advantages over gamma irradiation, including higher dose rate capacity, no nuclear waste, and the fact that the *e* beam accelerators can be easily switched on and off *(10)*. Additionally, *e* beam irradiation can be applied in a bi-directional manner by which radiation can come in contact with the top as well as the bottom of a food product, ensuring a more uniform application *(10)*. The *e* beam has been shown to have less impact on the quality of food because of its poor penetrability. Gamma irradiation has nevertheless been shown to increase the rate of oxidation, resulting in lower consumer acceptance *(9)*.

Researchers have used both gamma and *e* beam irradiation to improve the safety of poultry. Mahrour et al. reported that gamma irradiation significantly reduced the mesophilic aerobic plate counts on marinated chicken legs. The sampled bacterial populations decreased as the irradiation doses increased *(11)*. In a separate study, gamma irradiation was used to control *L. monocytogenes* in ready-to-eat sandwiches *(3)*. The study showed that a 5-log reduction would require an irradiation dose of 3.5 to 4.0 kGy. Lewis et al. used *e* beam irradiation to improve the microbial safety of boneless, skinless chicken breasts. It was found that a dose of 1.0 to 1.8 kGy was required for eliminating coliforms, generic *E. coli*, and psychrotrophs from the chicken breast meats *(10)*.

In the present study, we examined the effectiveness of *e* beam irradiation at a dose of 1.0, 2.0, or 3.0 kGy for the control of psychrotrophs and total aerobes, as well as artificially inoculated *L. monocytogenes*, on diced chicken meat and turkey frankfurters.

MATERIALS AND METHODS

Strains of *L. monocytogenes*

A six-strain mixture of *L. monocytogenes*, comprised of H7750, H7962, H7964, H7969, H8733, and H8808, was used in this study. The cultures were grown individually in tryptic soy broth (TSB) (Difco Lab., Sparks, MD) at 37°C for 24 h. An equal volume of each culture was subsequently pooled to constitute the six-strain mixture. The mixture was serially diluted with buffered peptone water (pH 7.40) (BPW). Appropriate dilutions were spirally plated on modified Oxford agar base (MOX) supplemented with antimicrobial supplements for *L. monocytogenens*. The inoculated plates were incubated at 37°C for 48 h. After incubation, the colonies on the MOX plates were enumerated and the population of *Listeria* cells in the mixture was calculated.

Irradiation of meat samples

Diced chicken meat and turkey frankfurters were obtained from a commercial meat processing facility in Georgia. The diced chicken meat and turkey frankfurters were divided into equal samples of 142 g and 168 g, respectively. Both the diced chicken meat and turkey frankfurters were surface-inoculated with the six-strain mixture of *L. monocytogenes* at ca. 10^2 and 10^4 CFU/g, respectively. After the inoculation, the samples were packaged in vacuum-sealed polyvinyl pouches (6½ in. × 5 in. × 1 in.) and kept in biohazard containers (21 in. × 18 in. × 16 in.) approved by the International Air Transport Association/ International Civil Aviation Organization (IATA/ICAO). The containers were covered with dry ice and shipped by air to an irradiation facility, IBA, in San Diego, CA. The shipping container consisted of two secondary containers, each consisting of an outer bag, a liner bag, and a biohazard bag. Each secondary container was infectious substance certified. Pouches of contaminated meats were placed inside the secondary containers and two loaded secondary containers were placed inside the main shipping container with approximately 18 kg of dry ice. This insulated corrugated outer container was appropriately labeled.

The diced chicken meat and turkey frankfurter samples described above were divided into four groups, and all samples were stored at 4°C after arriving at the irradiation facility and prior to irradiation treatment. Each group was exposed to an *e* beam irradiation dose of 1.0, 2.0, or 3.0 kGy. The groups selected as positive controls were inoculated with *L. monocytogenes* but not exposed to any irradiation treatment, whereas the groups selected as the negative controls were not inoculated with *L. monocytogenes* but were exposed to irradiation treatment.

Storage of the samples

The irradiated samples and non-irradiated controls were shipped back, under the conditions previously described, to our laboratory on the day following the irradiation treatment and stored at 4°C. The frankfurters were stored in the original packages, while the diced chicken meat was transferred to zip-lock bags (Kroger, Griffin, GA) prior to refrigerated storage in order to mimic the storage condition of diced chicken meat in restaurant services. The meats were subjected to microbiological evaluation twice a week during a 4-week storage period at 4°C. All experiments were carried out with appropriate duplications and replications.

Microbiological evaluation

On each sampling day, diced chicken meat (25 g) and turkey frankfurter meat samples (56 g) were withdrawn from

TABLE 1. Effectiveness of e beam irradiation in control of *L. monocytogenes*, as well as total aerobic and psychrotrophic bacteria on turkey frankfurters

Inoculation level (log CFU/g)	0				10^2				10^4			
Dose of irradiation (kGy)	0	1	2	3	0	1	2	3	0	1	2	3
L. monocytogenes												
Storage time												
0	0.00^{A}	0.00^{A}	0.00^{A}	0.00^{A}	3.11^{A}	0.87^{B}	0.00^{C}	0.00^{C}	4.70^{A}	2.57^{B}	0.15^{C}	0.15^{C}
7	0.00^{A}	0.00^{A}	0.00^{A}	0.00^{A}	3.79^{A}	2.09^{B}	0.57^{C}	0.00^{C}	5.37^{A}	3.36^{B}	1.59^{C}	0.00^{D}
14	0.00^{A}	0.00^{A}	0.00^{A}	0.00^{A}	4.02^{A}	2.94^{A}	1.70^{AB}	0.00^{B}	4.54^{A}	2.95^{AB}	2.21^{AB}	1.15^{C}
21	0.00^{A}	0.00^{A}	0.00^{A}	0.00^{A}	4.41^{A}	2.23^{B}	2.05^{B}	0.00^{C}	5.23^{A}	3.49^{AB}	3.50^{AB}	1.52^{B}
28	0.00^{A}	0.00^{A}	0.00^{A}	0.00^{A}	4.58^{A}	2.83^{A}	3.59^{A}	0.00^{B}	4.72^{A}	3.20^{B}	3.86^{AB}	0.61^{C}
Total aerobes												
Storage time												
0	2.42^{A}	0.00^{B}	0.00^{B}	0.00^{B}	3.46^{A}	0.72^{B}	0.00^{B}	0.00^{B}	4.70^{A}	2.62^{B}	0.30^{C}	0.15^{C}
7	2.39^{A}	0.85^{AB}	0.76^{AB}	0.00^{B}	3.81^{A}	2.00^{B}	0.78^{C}	0.00^{D}	5.26^{A}	3.56^{B}	1.56^{C}	0.00^{D}
14	1.98^{A}	0.00^{AB}	0.57^{B}	0.00^{B}	4.30^{A}	3.21^{A}	2.37^{A}	0.00^{B}	5.47^{A}	3.16^{AB}	2.48^{AB}	1.35^{B}
21	2.15^{A}	0.15^{B}	0.15^{B}	0.24^{B}	4.41^{A}	2.40^{B}	2.35^{B}	0.00^{C}	5.48^{A}	3.62^{A}	3.62^{A}	3.82^{A}
28	1.47^{A}	0.00^{B}	0.00^{B}	0.00^{B}	4.65^{A}	2.81^{A}	3.52^{A}	0.00^{B}	4.89^{A}	3.37^{B}	3.98^{AB}	0.67^{C}
Psychrotrophs												
Storage time												
0	6.90^{A}	4.60^{AB}	3.30^{AB}	1.92^{B}	4.50^{A}	2.98^{AB}	1.10^{BC}	0.00^{C}	6.39^{A}	5.04^{AB}	2.42^{BC}	1.22^{C}
7	7.06^{A}	6.19^{A}	5.08^{B}	4.19^{B}	5.29^{A}	4.44^{AB}	4.83^{A}	3.70^{B}	7.24^{A}	6.29^{A}	6.04^{A}	3.56^{B}
14	6.38^{A}	6.20^{A}	6.40^{A}	4.40^{B}	6.01^{A}	5.96^{A}	5.20^{A}	2.38^{A}	7.43^{A}	5.93^{AB}	5.84^{AB}	5.18^{B}
21	5.77^{A}	5.60^{A}	6.61^{B}	5.69^{A}	5.87^{A}	4.93^{A}	5.52^{A}	2.37^{A}	6.38^{AB}	6.25^{AB}	7.07^{A}	5.31^{B}
28	6.56^{A}	6.00^{AB}	5.74^{B}	6.47^{A}	5.92^{A}	5.37^{A}	6.31^{A}	0.66^{B}	5.89^{A}	4.33^{B}	6.98^{C}	6.46^{BC}

Means at each inoculation level followed by the same superscript letters in the same row are not statistically different.

storage and mixed with 225 or 504 ml of BPW, respectively, in sterile stomacher bags. The samples were homogenized at normal speed for 30 s. The homogenates were serially diluted with BPW, and 50 µl of appropriate dilutions were spirally plated in duplicate on MOX agar plates for the enumeration of *L. monocytogenes*, and on tryptic soy agar (TSA) plates for the enumeration of total aerobic and psychrotrophic bacteria, using the Autoplate® 4000 automated spiral plater (Spiral Biotech, Bethesda, MD, USA). The TSA plates were incubated at 7°C for 7 days for psychrotrophic bacteria and at 37°C for 24 h for total aerobic bacteria. The MOX plates were incubated at 37°C for 48 h. The colonies on each plate were enumerated by use of a **Q***COUNT*™ automatic colony counter (**Q***COUNT*™ software, Spiral Biotech, Bethesda, MD, USA). The detection limit of the microbiological analysis was 20 CFU/g. When *L. monocytogenes* counts dropped below this level, samples were enriched in UVM *Listeria* enrichment broth and incubated at 32°C for 24 h. The enriched cultures were then transferred from the UVM *Listeria* enrichment broth to Fraser broth and incubated at 32°C for 24 h. After incubation, a portion of the positive Fraser broth cultures was streaked on MOX agar plates. The plates were incubated at 32°C for 48 h and examined for the presence of presumptive *L. monocytogenes* colonies.

RESULTS AND DISCUSSION

It was found that *e* beam irradiation at 3 kGy was effective in eliminating ca. 10^2 CFU/g of *L. monocytogenes* on turkey frankfurters (Table 1) and diced chicken meat (Table 2). However, the same treatment was unable to eliminate the inoculated *L. monocytogenes* at 10^4 CFU/g inoculation level (Table 1 and 2). While lower *e* beam doses, i.e., 1 and 2 kGy, significantly reduced the populations of *L. monocytogenes*, they were ineffective

TABLE 2. Effectiveness of e beam irradiation in control of *L. monocytogenes*, as well as total aerobic and psychrotrophic bacteria on diced chicken meat

Inoculation level (CFU/g)	0				10^2				10^4			
Dose of irradiation (kGy)	0	1	2	3	0	1	2	3	0	1	2	3
L. monocytogenes												
Storage time												
0	0.00^{A}	0.00^{A}	0.00^{A}	0.00^{A}	2.02^{A}	0.15^{B}	0.00^{B}	0.00^{B}	4.14^{A}	2.34^{B}	1.02^{C}	0.00^{D}
7	0.00^{A}	0.00^{A}	0.00^{A}	0.00^{A}	2.92^{A}	0.39^{B}	0.0^{B}	0.00^{B}	5.04^{A}	2.58^{B}	0.42^{C}	0.00^{C}
14	0.00^{A}	0.00^{A}	0.00^{A}	0.00^{A}	6.05^{A}	3.62^{B}	2.58^{B}	0.00^{C}	7.41^{A}	5.45^{AB}	3.22^{BC}	1.19^{C}
21	0.00^{A}	0.00^{A}	0.00^{A}	0.00^{A}	7.44^{A}	6.86^{A}	2.51^{AB}	0.00^{B}	8.33^{A}	8.11^{A}	6.84^{AB}	5.32^{B}
28	0.00^{A}	0.00^{A}	0.00^{A}	0.00^{A}	7.67^{A}	7.57^{A}	6.99^{B}	0.00^{C}	8.35^{A}	8.45^{A}	8.20^{AB}	7.67^{B}
Total aerobes												
Storage time												
0	1.30^{A}	0.15^{B}	0.00^{B}	0.00^{B}	2.23^{A}	0.90^{B}	0.15^{C}	0.00^{C}	4.36^{A}	2.73^{B}	0.95^{C}	0.30^{C}
7	4.97^{A}	1.95^{B}	0.71^{C}	0.15^{D}	3.93^{A}	2.28^{B}	0.89^{C}	0.00^{D}	5.11^{A}	2.77^{B}	1.06^{C}	0.30^{C}
14	8.64^{A}	6.21^{B}	4.07^{BC}	3.03^{C}	8.56^{A}	7.22^{B}	4.68^{C}	4.62^{C}	8.57^{A}	7.55^{A}	4.31^{B}	4.01^{B}
21	9.31^{A}	8.31^{B}	6.05^{C}	5.91^{C}	9.13^{A}	9.04^{AB}	7.39^{BC}	6.03^{C}	9.70^{A}	9.06^{A}	7.60^{B}	6.40^{B}
28	9.91^{A}	8.36^{AB}	8.07^{AB}	6.75^{B}	9.47^{A}	9.16^{A}	8.31^{AB}	6.73^{B}	9.33^{A}	9.29^{A}	8.93^{A}	8.02^{B}
Psychrotrophs												
Storage time												
0	1.87^{A}	0.45^{B}	0.39^{B}	0.00^{B}	2.34^{A}	0.69^{B}	0.30^{BC}	0.15^{C}	4.14^{A}	2.71^{B}	1.21^{C}	0.00^{D}
7	4.29^{A}	3.91^{AB}	3.67^{B}	3.19^{C}	5.88^{A}	4.86^{B}	4.01^{C}	3.17^{D}	6.43^{A}	5.57^{A}	3.89^{B}	3.48^{B}
14	7.37^{A}	7.82^{A}	6.82^{A}	4.57^{B}	8.11^{A}	8.01^{A}	6.51^{B}	5.13^{C}	8.47^{A}	7.54^{B}	6.45^{C}	4.80^{D}
21	10.45^{A}	9.37^{B}	9.19^{B}	8.77^{C}	10.34^{A}	9.41^{B}	9.19^{B}	8.77^{C}	10.52^{A}	9.03^{B}	9.07^{B}	8.83^{B}
28	10.19^{A}	10.01^{B}	9.70^{C}	9.40^{D}	10.24^{A}	9.84^{AB}	9.58^{E}	9.48^{B}	10.30^{A}	9.71^{B}	9.52^{BC}	9.31^{C}

Means at each inoculation level followed by the same superscript letters in the same row are not statistically different.

in eliminating the pathogen even at the 10^2 CFU/g inoculation level in both turkey frankfurters and diced chicken meat (Table 1 and 2). The populations of the surviving *L. monocytogenes* increased during the 4-week storage period at 4°C, and the populations of the pathogen reached 2.83–3.86 log CFU/g on frankfurters (Table 1) and 6.99–8.45 log CFU/g on diced chicken meat (Table 2) at the end of the storage period.

Previous studies have indicated that *Listeria* is more resistant to irradiation than *E. coli, Aerobacter, Campylobacter, Yersinia,* and *Staphylococcus* in processed food *(4, 5, 7, 8, 14)*. Factors that affect the effectiveness of radiation include method of cooking, concentration of bacteria in food, and temperature of product during the irradiation treatment. Thayer et al. showed that *L. monocytogenes* inoculated on raw turkey nuggets was more susceptible to irradiation than that inoculated on cooked turkey nuggets *(15)*. In separate studies, Andrews et al. *(1)* and Patterson et al. *(12)* showed that higher concentrations of *L. monocytogenes,* in liquid media or on meat, require larger doses of radiation for elimination.

The *e* beam irradiation at 3 kGy caused significant reductions in the populations of total aerobic bacteria on turkey frankfurters (Table 1). The treatment reduced the total aerobic counts to the undetectable level on the uninoculated frankfurters and on frankfurters inoculated with ca. 10^2 CFU/g of *L. monocytogenes*. Turkey frankfurters inoculated with ca. 10^4 CFU/g of *L. monocytogenes* and treated with 3 kGy of *e* beam, however, had an overall mean total aerobic count of 0.67 log CFU/g at the end of the storage period (Table 1). The uninoculated frankfurters and the frankfurters inoculated with 10^2 CFU/g of *L. monocytogenes* had a level of total aerobic bacteria below the level of detection immediately after the irradiation treatment at 2 kGy. The cells started

to recover after this point, and by day 7 at 4°C their populations reached 0.76–0.78 log CFU/g (Table 1). The frankfurters inoculated with 10^4 CFU/g of *L. monocytogenes* tested positive for total aerobic bacteria after irradiation treatment at 2 kGy (Table 1). None of the irradiation treatments eliminated total aerobic bacteria on the diced chicken meat samples included in the study, although with treatments at 2 or 3 kGy, the populations of total aerobic bacteria on the uninoculated diced chicken meat, and on chicken meat inoculated with 10^2 CFU/g of *L. monocytogenes*, temporarily dropped below the detectable level (Table 2).

The results of the present study also showed that *e* beam irradiation was generally ineffective in reducing the populations of psychrotrophs on turkey frankfurters (Table 1) and diced chicken meat (Table 2) even at the dose of 3 kGy. The overall mean populations of psychrotrophs were 2.37–7.07 log CFU/g on turkey frankfurters (Table 1) and 8.83–10.52 log CFU/g on diced chicken meat (Table 2) at the end of their expected shelf life of 21 days at 4°C.

In general, *e* beam irradiation at 3 kGy better controlled the mesophilic bacterial counts on frankfurters (Table 1) than on diced chicken meat (Table 2). This may be attributed to the physical characteristics of each meat product. Frankfurters, because they are more uniform in size and shape, are subject to more uniform and therefore more effective irradiation than is diced chicken meat, which is irregular in shape and size, with in-folds and out-folds of meat fibers that prevent exposure to uniform irradiation treatment. The unique characteristics of diced chicken meat may be among the contributing factors for its higher populations of mesophilic and psychrotrophic cells. Additionally, the irradiated frankfurters were stored in their original vacuum packages, while diced chicken meat was transferred to zip-lock bags before storage at 4°C. Transferring diced chicken meat from the original to loose packages after the irradiation treatment may reintroduce microorganisms into the meat samples. The loose packaging condition during storage may have promoted the growth of psychrotrophic and total aerobic bacteria. Gill et al. observed the influence of loose packaging on the safety of poultry and found that the loose packaging could shorten the shelf life of poultry carcasses by as much as 50% compared to that achieved by vacuum packaging *(6)*.

CONCLUSION

The results of this study indicated that a dose of *e* beam irradiation as high as 3kGy is effective in control of the safety of ready-to-eat meats. However, it is crucial that the irradiated meat products be handled appropriately in order to maintain the safety of the meats ensured by the irradiation treatment. The major limitation of *e* beam irradiation technology continues to be penetrability. Therefore, more research is needed to make irradiation technology applicable to areas where high levels of bacterial reduction, especially high levels of psychrotrophic bacterial reduction, is desired.

ACKNOWLEDGMENTS

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Comparison of Russian and United States Official Methods of Analysis of Poultry for *Salmonella*

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SUMMARY

Laboratory tests to compare the official analytical methods for detection of *Salmonella* in poultry from Russia and the United States were conducted within the framework of the US-Russian Poultry Safety Consulting Center. Samples of ground poultry meat, both inoculated and non-inoculated with *Salmonella*, were analyzed. The samples were coded so that the researchers did not know the status of each sample. The samples were tested by two teams of researchers, each including representatives of the US and Russian parties. Each team received a set of 50 samples, of which 20% were inoculated with *Salmonella* spp. at a population of 3 to 25 CFU/gram. The official methods of the two countries were very similar in many respects. Based on the testing of positive (test) and negative (control) samples, it was demonstrated that the methods were not statistically different with this sample set and both methods correctly identified all inoculated samples, with no false positive or false negative samples detected.

INTRODUCTION

Salmonella spp. are some of the leading causes worldwide of bacterial gastroenteritis in human beings and animals *(2)*. Animals represent the main source of *Salmonella* spp., while their raw materials and products of animal origin, above all poultry products, remain the major pathophoric factors. The significance of *Salmonella* is such that these organisms were the subject of a performance standard in the Pathogen Reduction/HACCP rule issued by the United States Department of Agriculture in 1996. Their control is also incorporated into the regulations of most countries *(3)*.

Although the Russian Federation has a developed domestic poultry industry, poultry remains a major import item. In 2005, the United States exported approximately 700,000 metric tons of poultry and poultry products to Russia. Within the context of the World Trade Organization and its objectives, the harmonization of food safety standards is critical. A key aspect of the harmonization of standards is the recognition of the equivalency of different analytical methods by trading partners.

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TABLE 1. Outcome of the Russian analytical method for detection of *Salmonella* in ground poultry

Sample	Determined Positive	Determined Negative
Non-inoculated control sample 40 Negative samples	0	40
Inoculated positive sample 10 Positive samples	10	0

TABLE 2. Outcome of the United States analytical method for detection of *Salmonella* in ground poultry

Sample	Determined Positive	Determined Negative
Non-inoculated control sample 40 Negative samples	0	40
Inoculated positive sample 10 Positive samples	10	0

The objective of this study was to conduct a comparative evaluation of the official Russian and United States microbiological methods for recovering and detecting *Salmonella* in poultry meat, both from a procedural aspect and from an efficacy basis. This study is an initial step of a comprehensive program to compare isolation methods for toxigenic pathogens in poultry products as used by scientific and educational institutions in the framework of the US–Russian Poultry Safety Consulting Center. This study was not intended to be equivalent to an AOAC collaborative study, but it did allow scientists from both the United States and Russia to work side by side to become familiar with the standard methods used in both countries for analysis of *Salmonella*.

MATERIALS AND METHODS

Preparation of samples

To conduct comparative tests for isolation of *Salmonella* spp., the researchers used raw mechanically deboned ground chicken meat (hereafter referred to as ground meat). Prior to sample preparation, the ground meat was placed into sterile glass beakers of 400–500 g capacity. Because *Salmonella* spp. are commonly found in mechanically separated meat, the ground meat was autoclaved twice within 24 h for 1 hour under 1 atmospheric pressure. This treatment was sufficient to eliminate gram-negative bacteria, but did not result in an entirely sterile sample.

Positive samples were prepared by inoculating ground meat with a 5-strain mixture of *S. enterica* serovar Typhimurium, *S. enterica* serovar Enteritidis, *S. enterica* serovar Gallinarium-Pullorum, *S. enterica* serovar Cholerasuis, *S. enterica* serovar Senftenberg, and *S. enterica* serovar Dublin in equal numberss to a final population of 3 – 20 (± 0.03) cells of salmonellae per gram. Negative samples were simply the autoclaved ground meat not inoculated with *Salmonella* spp.

Positive and negative samples were placed into plastic screw-cap containers and hermetically sealed with paraffin for storage at -18°C for 72 h.

Analytical Methods

The Russian Analytical Method used in this study is the official method of analysis for poultry *(1)*. 25 g of each sample were added to 125 ml of buffered peptone water and incubated at 37°C for 16–24 h. The non-selective enriched samples were then transferred (10 ml into 90 ml) to selenite broth and incubated at 37°C for 24–48 h. At both 24 and 48-h increments, the selective enrichment was streaked for isolation onto Bismuth Sulfite agar and Levine's EMB agar, and samples were incubated at 37°C for 18 – 24 (EMB) or 48 (BSA) h. Suspect colonies (up to 5 colonies per plate) were transferred to triple sugar iron agar (TSI, Merck) and TSA, and incubated at 37C for 18–24 h. Isolates that were presumptive for *Salmonella* on TSI were verified by reacting with polyvalent somatic ("O") *Salmonella* antisera (Merck). Isolates that agglutinated the polyvalent antisera were analyzed by use of the API-20E biochemical tests (bioMérieux). If an isolate was confirmed by biochemical testing, the sample was classified as *Salmonella* positive (+).

United States Method *(4)*. 25 g of each sample were homogenized in 225 ml of buffered peptone water and incubated at 37°C for 18–24 h. The non-selective enriched samples were then transferred to tetrathionate broth (TT, Merck; 0.5 ml into 10 ml) and Rappaport broth (Rp, Merck; 0.1 ml into 10 ml), and incubated at 42°C for 24–48 h. At 24 h, the selective enrichment cultures were streaked for isolation onto XLT-4 agar (Merck) and incubated at 37°C for 18–24 h. Suspect colonies (up to 3 colonies per plate) were transferred to triple sugar iron agar (TSI, Merck), Lysine Iron agar (LIA, Merck) and TSA, and incubated at 37°C for 18 – 24 h. Isolates that were presump-

TABLE 3. Kappa equivalence statistics for the Russian and United States analytical methods

Statistic	Russian Analytical Method	United States Anaytical Method
Kappa measure of agreement	1	1
Variance (k)	0,02	0,02
Sensitivity	1	1
Variance (sensitivity)	0	0
Standard Error (s.e.)	0,14142	0,14142

tive for *Salmonella* on TSI and LIA were verified by reacting with polyvalent somatic ("O") *Salmonella* antisera (Merck). Isolates that agglutinated the polyvalent antisera were analyzed by use of the API-20E biochemical tests (bioMérieux). If an isolate was confirmed by biochemical testing, the sample was classified as *Salmonella* positive (+).

RESULTS

The results of the individual analytical methods are shown in Tables 1 (Russian) and 2 (United States). All of the tested samples (both positive and negative) were correctly identified by the Russian method, as well as by the United States method. The Kappa (κ) statistics for how well the results of each protocol agree with the known positive and negative samples were calculated for each method by use of an online worksheet (http://home.clara.net/sisa/diagnos.htm). The results of the statistical analysis are shown in Table 3.

DISCUSSION

The two analytical methods were similar in many respects. This is hardly surprising, in as much as both were intended to isolate *Salmonella* spp. from the same food matrix. Both methods employ a non-selective enrichment procedure, the only difference being in the dilution factor (1:5 for the Russian method compared to 1:10 for the United States method). Both methods employ a selective enrichment procedure, although there are differences in volume of sample transferred, media and incubation temperature. The Russian method transfers 10 ml of the non-selective enrichment into 90 ml of selenite broth, while the United States method transfers 0.1 ml and 0.5 ml of the non-selective enrichment into 10 ml of both Rappaport Broth and Tetrathionate Broth, respectively. The Russian method incubates the selective enrichment broth at 37°C, while the United States method incubates the selective broths at 42°C.

Both methods employ a selective plating step, although again the media differ. The Russian method employs Bismuth Sulfide agar and Levine's EMB agar, while the United States method employs XLT-4. All of these are common media for the differentiation of *Enterobacteriaceae*, and it is likely that all are similar in their ability to select and differentiate for salmonellae. The Russian method employs a 48–h incubation period for the Bismuth Sulfide agar, which again is common practice for this medium.

Biochemical differentiation is virtually identical in the two methods. Both employ triple sugar iron agar, although the United States method adds a second medium, Lysine Iron agar.

The intent of this step in the research was to obtain *Salmonella* spp. isolates before proceeding with final confirmation. After biochemical differentiation, the Russian and United States procedures are identical. Both use serological confirmation and further biochemical testing for confirmation of the isolates. Once the isolates are confirmed, the samples are classified as positive (+).

Both methods were equally efficient in recovering salmonellae from the inoculated samples. In this sample set, the results obtained with the two methods were not statistically different, according to Kappa equivalence statistics. However, additional testing of naturally contaminated poultry samples is needed for full demonstration of the equivalency of these two analytical methods.

This study achieved the initial objective of allowing scientists from both Russia and the United States to evaluate the standard methods of analysis for *Salmonella* in poultry. Given the very minor differences in the actual methodology, a very elaborate study would be required to determine any differences in sensitivity or specificity between the two methods.

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IAFP 2007 in Review

With Cinderella's castle of dreams on the horizon and fireworks painting the night sky, the 94th Annual Meeting of the International Association for Food Protection, held July 8–11, found a home for its own magic in Lake Buena Vista, Florida, where a record 2,126 attendees alighted on Disney's Contemporary Resort for the world's leading food safety conference.

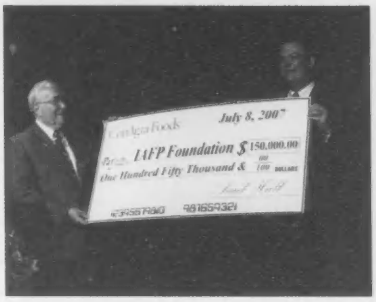
Generously supported by our vibrant team of sponsors, IAFP was able to continue its tradition of hosting a meeting filled with dynamic events and opportunities. Again this year our attendees enjoyed lunch and networking in the Exhibit Hall, where dedicated representatives from 114 companies showcased innovative equipment and services for the field of food safety. Please help us thank these creative exhibitors and sponsors, who are listed on page 852, for bringing our Exhibit Hall to life.

More than 80 attendees kicked off the IAFP 2007 experience on Saturday morning with our Workshop series. Instructed by prominent industry professionals, the three in-depth offerings included a wet lab for Environmental Sampling of Food and Water, designed for staff and managers responsible for sampling plans and corrective action responses to facility data; Predictive Microbiology as a HACCP Validation and Support Tool, which addressed growth, survival, and inactivation models for application in real-life problems; and a train-the-trainer approach to Controlling *Listeria monocytogenes* in Ready-to-Eat Meat and Poultry Products, intended to equip extension specialists with control strategies against the pathogen during the processing and storage phases.

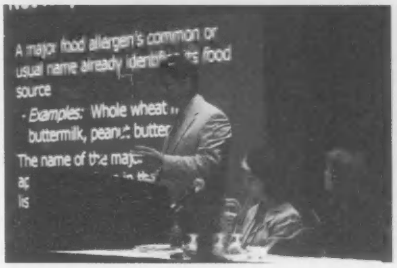
Those arriving by early evening on Saturday were greeted at the Welcome Reception, where new Members and first-time attendees were able to meet and mingle with the IAFP Executive Board and other leaders within the Association. This was a great opportunity to ensure seeing familiar faces on Sunday morning, which marked a full day of meetings for the numerous Special and Standing Committees and Professional Development Groups (PDGs) that sustain the heart of IAFP. We invite you to review the minutes from these meetings (pages 817–838), and to become involved in the committee or group that's right for you by calling the IAFP office.

The audience of the Sunday evening Opening Session received a Disney-flavored, personal welcome from none other than Mickey and Minnie Mouse, who magically produced IAFP President Frank Yiannas from a billowing blue banner. Following Mr. Yiannas' salutation, Local Arrangements Committee members Natalie Dyenson and Eric Martin extended greetings on behalf of the Florida Association for Food Protection (FAFP), whose welcome gifts for attendees were cleverly presented in the mesh bags used for oranges and grapefruits. We are truly grateful for the enthusiasm, dedication, and incomparable support provided by our FAFP friends.

After presenting a charter to the newest IAFP Affiliate, the Australian Association for Food Protection, Mr. Yiannas introduced Gale Prince, Chair of the IAFP Foundation. Mr. Prince topped his own generous pledges from previous years by offering to match the first $5,000 pledged to the Foundation. In response to this challenge, inspired givers pledged over $20,000 during and following IAFP 2007 to help perpetuate the mission of the Foundation, which includes funding of the Student Travel Scholarship Award. The five recipients of this year's award were then welcomed to the stage by Mr. Prince to receive their plaques: Rebecca Goulter of the University of Queensland, Australia; Hyun-Ho Jin of Chung-Ang University, South Korea; Ivan Nastasijevic of the University of Novi Sad, Serbia; Haley F. Oliver of Cornell University, New York; and Rebecca Robbins of North Carolina State University, Raleigh.



Spotlight on the IAFP Foundation continued when Dr. Paul Hall, Vice President of Global Food Safety for ConAgra Foods, presented the Foundation with a check for an astounding $150,000, on behalf of his employer. Dr. Hall was also the recipient of the year's IAFP Fellow Award, which recognizes Members who



have contributed to IAFP and its Affiliates with distinction over an extended period of time. We send a rousing congratulations and thanks to Dr. Hall for his honorable work with the Association, and invite you to read his profile on page 763.

The Opening Session culminated with the introduction of Carl Custer, recently retired from USDA-FSIS, who delivered the year's prestigious Ivan Parkin Lecture on the wittily titled *It's the Science, Stupid: Reflections on 41 Years as a Food Microbiologist.* After this educational and entertaining presentation by Mr. Custer, a lively crowd that included Mickey and Minnie Mouse headed to the Exhibit Hall to enjoy the tasty Cheese and Wine Reception sponsored by Kraft Foods.

Monday morning commenced three stimulating days of symposia, roundtable discussions, and technical and poster sessions—all brought to fruition by our amazing Program Committee, chaired by Dr. Lee-Ann Jaykus. With 550 presentations, there was truly something for professionals from every sector of the food safety industry. We applaud all members of the committee for their time and energy devoted to planning this remarkable program.

The sold-out Monday Night Social, American Adventure at Epcot, was a dazzling success. Attendees were serenaded into the park by musicians in colonial attire, ushered into the elegant American Rotunda for dinner and cocktails, and offered dessert with a first-class view of fireworks over the World Showcase Lagoon.

Again this year, IAFP Student Members were in full force behind many of the meeting's events and activities. The popular Student Luncheon, sponsored by Texas A&M Department of Animal Science Food Safety, featured Dr. Lee-Ann Jaykus of North Carolina State University speaking on how to prepare an abstract. As continuing hosts of the IAFP Job Fair, the Student PDG worked to facilitate opportunities between employers and job seekers. Throughout the meeting, the students worked from their well-visited booth to raise funds through t-shirt sales and provide resources for all student attendees. The heavy rain on Tuesday evening did little to dampen the spirits of this harmonious, hardworking crowd, who simply moved their outdoor Student Mixer from the portico to the Fantasia Lobby, and carried on with their festivities.

At the Annual Business Meeting on Tuesday, IAFP President Frank Yiannas reported on the Association's accomplishments and activities over the past year. The chairs of the standing committees delivered brief reports of their work, and Affiliate Council Chair Maria Teresa Destro reported on the progress of IAFP Affiliates. Meanwhile, the Florida Association for Food Protection, not to be outdone by their own past performances, literally worked behind the scenes before starring in their live, food safety professional's parody of "Star Wars," which produced infectious laughter and resulted in the presentation of their donation of $5,000 to the IAFP Foundation.

As always, the Silent Auction offered an outlet for creative expression and fun shopping—all for the noble benefit of the IAFP Foundation. Thanks to the generosity of our donors and bidders, this year's auction brought in $10,000 to further the many programs that depend on the support of the Foundation.

The meeting's grand finale presentation, the John H. Silliker Lecture entitled *Trends in Food Safety Management,* was delivered on Wednesday afternoon by Dr. Terry A. Roberts, Food Safety Hygiene Consultant from Reading, England. A summary of Dr. Roberts' outstanding presentation appears on page 784. We are grateful to Silliker, Inc. for their commitment to providing this vital lecture experience year after year, and extend our congratulations as the company celebrates its fortieth anniversary this year.

The Annual Awards Banquet is the Association's time-honored event to award excellence in food safety. This year, 25 individuals and organizations were recognized for their efforts in advancing food safety worldwide (see page 762). Frank Yiannas was applauded for his dedicated service as IAFP President, and the gavel was passed to Incoming President Gary Acuff.

From the enthusiasm of our Program Committee, sponsors, and exhibitors to the avid participation of our record-breaking number of attendees, IAFP 2007 was destined to make a mark on our eclectic history of Annual Meetings. We hope that you gained insight and support, were inspired to put ideas and projects into motion, and walked away rejuvenated by your experience with us. You can be sure that we are already working to deliver all of this and more at IAFP 2008, August 3–6 in Columbus, Ohio. We look forward to seeing you there!

A special thank you to Jim Heemstra, photographer at IAFP 2007!

IAFP 2007 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 2007 IAFP Black Pearl Award is Beef Products, Inc.

Black Pearl Award

Beef Products, Inc.

Dakota Dunes, South Dakota

Jeffrey Farber (left) and Wilbur Feagan (right) from F & H Food Equipment Co. present Regina Roth and Eldon Roth from BPI with the Black Pearl Award.

Beef Products, Inc. is the world's leading producer of lean beef processed from fresh beef trimmings. BPI's products are 94 percent lean beef that is derived from under-utilized beef trimmings using BPI's proprietary technology developed by BPI Technology, Inc. Typically blended with other beef trimmings in the manufacture of ground beef, BPI's products can be found in most ground beef products sold in the US. The company's four plants, currently capable of processing between 10 and 11 million pounds per week, produced over 450 million pounds of lean beef products in 2006.

BPI is one of the industry's most inventive producers of processed beef. In addition to its innovative technology that separates lean beef from beef trimmings, the company has developed a "pH enhancement" process that decreases the risk of microbial contamination in the finished product. The pH enhancement process is recognized for improving food safety and is widely utilized in the best tasting ground beef.

As it works to perfect and commercialize new injection technology, brine systems, and processing techniques, BPI's food safety innovations are leading the company into other markets. New operations will soon be established for the production of high quality, flavorful, 95 percent lean ground beef products along with the enhancement of other whole muscle products.

Sponsored by Wilbur Feagan and F&H FOOD EQUIPMENT COMPANY

Fellow Award

Fellows are professionals who have contributed to IAFP and its affiliates with distinction over an extended period of time. Dr. Paul A. Hall received a distinguished plaque in recognition of this prestigious award.

Paul A. Hall

Omaha, Nebraska

Jeffrey Farber (left) and Frank Yiannas (right) present Paul A. Hall with the IAFP Fellow Award.

Dr. Paul Hall has been a mentor and inspiration to many students and developing food safety professionals throughout his career and in his service to IAFP, making him a worthy candidate for this recognition.

Dr. Hall earned his BS in Microbiology from the University of Missouri–St. Louis, his MS in Technology Management from Washington University, and his Ph.D. in Quality Management from LaSalle University. He is presently the Vice President of Global Food Safety for ConAgra Foods, Inc., responsible for the microbiological safety and stability of some of the most well-known food brands in North America and beyond.

Prior to his present appointment with ConAgra Foods, Dr. Hall was Vice President of Global Business Development for Matrix MicroScience, Inc., a leading technology company that focuses on the concentration, capture, and detection of foodborne pathogens and spoilage organisms. He devoted 17 years to Kraft Foods, where his last position was Chief Microbiology and Food Safety Officer at Kraft Global. Dr. Hall has also held positions as a Microbiology Manager in Corporate Research and Development for Anheuser Busch Companies, Inc., and in Central Research for Ralston Purina Company, both located in St. Louis, MO.

Dr. Hall has lectured extensively around the world on microbiological food safety, HACCP, rapid testing and detection methods, and microbiological risk management. He has been active in various professional organizations and institutes including, among others, 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. He serves on the editorial boards of the *Journal of Rapid Methods and Automation in Microbiology* and *Food Safety* Magazine.

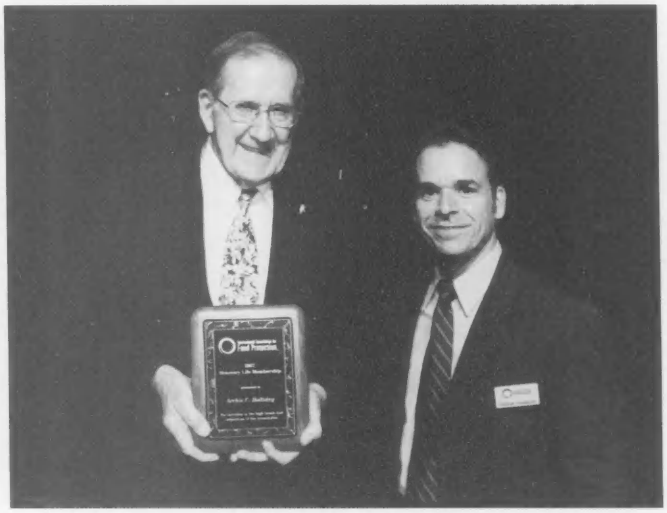
An IAFP Member for 24 years, Dr. Hall is a Past President of the Executive Board and the 2006 recipient of the prestigious Harold Barnum Industry Award for excellence in leadership and contributions to the area of microbiological food safety for the industry.

Honorary Life Membership Award

The IAFP 2007 recipient of the Honorary Life Membership Award is Mr. Archie C. Holliday. He has been an active IAFP Member since 1959, and a former Executive Board Member (1980–1986). Mr. Holliday is being honored with this award for his dedication and service to the high ideals and objectives of the Association.

Archie C. Holliday

Midlothian, Virginia



Frank Yiannas (right) presents Archie Holliday with the IAFP 2007 Honorary Life Membership Award.

A native of Newport News, Virginia, Mr. Holliday graduated from Augusta Military Academy and Virginia Tech, where he earned his BS in Dairy Husbandry. In 1955, following two years of service in the US Army, he became Quality Control Supervisor for Sealtest Southern Dairies in Richmond, Virginia. When he moved on to the Dairy and Foods Division of the Virginia Department of Agriculture and Consumer Services (VDACS) in 1959, his first assignment was to develop and conduct a year-long survey that would provide information to Virginia's dairy industry relative to butterfat and nonfat milk solids standards in raw milk. The results of this study were published in the *Journal of the American Dairy Science Association*. In his 32 years of service with VDACS, Mr. Holliday was a dairy farm inspector, served in several supervisory positions, and was Director of the Division of Dairy and Foods.

During his tenure with VDACS, Mr. Holliday was a member of the National Mastitis Council and served as a Virginia representative to the National Conference on Interstate Milk Shipments. In 1987–88, he assisted in the rewriting of the constitution and bylaws for the National Conference for Food Protection. He served as President for both the Southern and National Dairy Divisions of State Departments of Agriculture. Mr. Holliday was Annual Program Chair and Affiliate Officer for the Virginia Association of Sanitarians and Dairy Fieldmen. He is a member of the IAFP Past Presidents' Committee.

In retirement, Mr. Holliday enjoys participating in the work of Ruritan National, a community service organization. He and his wife, Evalyn, enjoy traveling and church activities.

Harry Haverland Citation Award

The IAFP 2007 recipient of the Harry Haverland Citation Award, Mr. Carl Custer is recognized for his years of dedication and devotion to the Association and its ideals and objectives. Mr. Custer has shared his expertise and knowledge in many different forums; he has been a mentor, both formal and informal, to many.

Carl Custer

Bethesda, Maryland

Gary Acuff (left) presents Carl Custer with the IAFP 2007 Harry Haverland Citation Award.

Mr. Carl Custer's retirement in March 2007 from the USDA's Food Safety Inspection Service and its predecessors, APHIS and FSQS, marked more than 40 years of successful efforts in bringing more science to regulations, regulatory policy, and federal food safety publications.

Mr. Custer launched his food microbiology career in 1966 at Texas A&M, advancing from a tech to a graduate student under Dr. Carl Vanderzant. In 1972, he joined the APHIS microbiology laboratory in Maryland to specialize in projects involving *Clostridium botulinum*. Promotion in 1980 led Mr. Custer to Washington, D.C. to focus on microbiological aspects of regulatory development, which resulted in his exposure to the interactions of politics and science in food safety regulatory promulgation.

In the course of his federal service, Mr. Custer developed the first cooling regulation that addressed both physics and microbiology, as well as the first dual-rate cooling policy based on physics, practicality, and microbiology. Despite a recalcitrant administration, he used current research to amend trichina destruction regulations by addressing bacterial hazards. Amidst the sticky politics of nitrites, he continually pushed the link between chemistry and microbiology for reducing both nitrosamines and the botulinal hazard.

For two decades, Mr. Custer explained the physics and microbiology of inactivating bacterial pathogens in jerky product to disbelieving processors and federal officials.

Expert services included inactivating bacterial pathogens in fermented sausages and other dried meat products, and advising the FSIS Hotline on the chemistry, physics, microbiology, and ethnic background of foods and food safety. He visited numerous establishments for surveys and studies, but primarily to troubleshoot and solve problems. The latter years of Mr. Custer's federal service were spent using his experience and expertise to train others. This training included working with AFDO in the development and presentation of workshops for retail operators and inspectors; assisting Maryland state in training local processors; and training FSIS inspectors, the Technical Service Center, and HQ personnel on sampling processing environments for *Listeria monocytogenes*.

A longtime IAFP Member, Mr. Custer's presence has impacted many Committees and Professional Development Groups over the years. A past chair of the Meat and Poultry Safety and Quality PDG, he continues to serve IAFP in a number of roles, including chair of the Nominating Committee and chair of the Affiliate Council.

Harold Barnum Industry Award

Ms. Jenny Scott is this year's recipient of the IAFP 2007 Harold Barnum Industry Award for her dedicated and exceptional service to IAFP, the public, and the food industry.

Jenny Scott
Washington, D.C.

Vickie Lewandowski (right) presents Jenny Scott with the IAFP 2007 Harold Barnum Industry Award.

Ms. Jenny Scott is sought frequently by food industry scientists, regulatory agency officials, and academics for her advice and expertise in food microbiology, HACCP, risk assessment, and crisis management.

Ms. Scott earned a BA in Biology from Wellesley College and an MS in Bacteriology from the University of Wisconsin. She worked for several years at the Food Research Institute, conducting research on *Clostridium botulinum* and other foodborne pathogens, before taking a position in 1980 as a research microbiologist at what was then the National Food Processors Association. During that time, Ms. Scott obtained a second MS in Food Science from the University of Maryland. She has held a variety of positions at the Association, including Head of Microbiology, Head of Microbiology and Processing, and Senior Director of Food Safety Programs.

Ms. Scott's present appointment is Vice President of Food Safety Programs at the Grocery Manufacturers/ Food Products Association (GMA/FPA) in Washington, D.C. GMA/FPA is a not-for-profit trade association that promotes sound public policy, champions initiatives that increase productivity and growth, and helps to protect the safety and security of the food supply through scientific excellence. Ms. Scott directs the Association's food safety activities on issues including food inspections, HACCP, and crisis management, along with providing GMA/FPA members and staff with technical assistance, expertise, and guidance on issues and policies related to microbial food safety. She drafts the Association's microbial food safety policy positions and comments on government regulations, and presents these positions at public meetings. She also oversees the Association's food safety training.

Ms. Scott is the author of numerous research papers and book chapters on microbial food safety and food processing. She has been active in several professional associations including the American Society for Microbiology; the Institute of Food Technologists (IFT), where she chaired the Food Microbiology Division; and IAFP, where she is a Past President of the Executive Board, and has served on various committees and PDGs since 1982. Ms. Scott is a Fellow of both IAFP and IFT, and has served on Council III (Science and Technology) of the Conference for Food Protection, which makes recommendations on changes to the FDA Model Food Code. Ms. Scott also serves on the US delegation to the Codex Committee on Food Hygiene, and on the US National Advisory Committee on Microbiological Criteria for Foods.

Elmer Marth Educator Award

The recipient of the IAFP 2007 Elmer Marth Educator Award is Dr. Elliot T. Ryser. This award recognizes an IAFP Member for dedicated and exceptional contributions to the profession of educator.

Elliot T. Ryser

East Lansing, Michigan

Dianne Sutton of Nelson Jameson (left) and Gary Acuff (right) present Elliot Ryser with the IAFP 2007 Elmer Marth Educator Award.

Dr. Elliot T. Ryser is regarded as a true teacher–scholar, supportive colleague, and graduate mentor, Dr. Ryser has enthusiastically impacted the research and publication of authoritative food safety information.

Dr. Ryser received his BS in Biology (1979) from Carroll College in Waukesha, Wisconsin, and his BS in Bacteriology (1980) from the University of Wisconsin–Madison (UWM). Under the direction of Dr. Elmer Marth at UWM, he earned his MS (1982) and Ph.D. (1990) degrees in Food Science.

Following research positions at the French National Institute for Agricultural Research (Jouy-en-Josas, France), Silliker Laboratories (Chicago Heights, IL), and The University of Vermont, Dr. Ryser accepted a research/teaching appointment at Michigan State University in 1998. He is now an Associate Professor in the Department of Food Science and Human Nutrition and The National Center for Food Safety and Toxicology, where he teaches a large-group undergraduate course entitled "Food Safety and HACCP" and a graduate level course on foodborne diseases.

Originally trained as a dairy microbiologist, Dr. Ryser's current research emphasizes cross contamination and quantitative bacterial transfer during handling of deli meats and leafy greens. His findings are already being used to refine several risk assessments and develop scientifically-based "best consume by" dates.

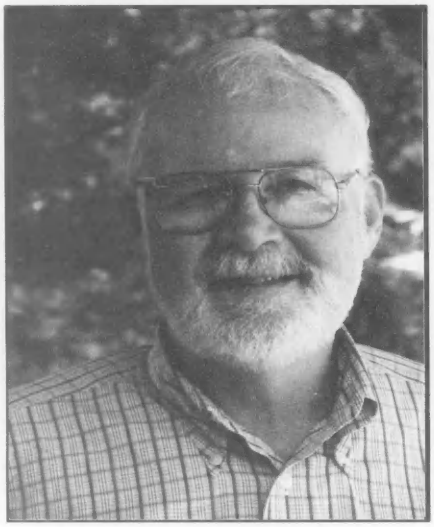
With his more than 20 students, postdoctoral research associates, and visiting scientists, Dr. Ryser has authored over 50 peer-reviewed publications and 100 abstracts, 40 of which have been presented at IAFP annual meetings. He is the author/co-editor of "*Listeria*, Listeriosis and Food Safety," now in its 3rd edition, and currently serves as a co-scientific editor for the *Journal of Food Protection*.

Sanitarian Award

The recipient of the IAFP 2007 Sanitarian Award is Charles A. "Bert" Barteson. This award honors an IAFP Member for dedication and exceptional service to the profession of sanitarian, serving the public and the food industry.

Charles A. "Bert" Bartleson

Olympia, Washington



Mr. Charles A. "Bert" Bartleson implemented HACCP in the food industry long before its present common use, serving as a leader in food protection and training throughout the United States.

Always "knowing" he would be a scientist, Mr. Bartleson discovered microbiology at Washington State University, where he earned his BSc in Bacteriology and Public Health. In his first environmental health job, he was a generalist in every program, investigating large outbreaks of foodborne illness while earning his MPH at the University of Hawaii.

In 1975, Mr. Bartleson began working in food safety for the Washington State Department of Health. It was during this time that he collaborated with Dr. Frank Bryan to complete and publish a series of HACCP studies on Chinese and Mexican restaurants. Mr. Bartleson later developed the critical items inspection approach emphasizing the factors causing outbreaks of foodborne illness. This would serve him well particularly in 1993, when he became immersed in the Jack in the Box *E. coli* O157:H7 outbreak investigation. In this deadly outbreak that triggered the USDA's development of the Pathogen Reduction Plan and endured more than 50 lawsuits, Mr. Bartleson testified as the state's expert, recalling 250,000 beef patties, handling media briefings, training staff for numerous health departments, and giving dozens of presentations.

Since retiring from the Washington DOH in 2001, Mr. Bartleson continues as a consultant on foodborne illness. He has served on the Science and Technology Council of the Conference for Food Protection. A longtime member of IAFP's Committee on Control of Foodborne Illnesses, Mr. Bartleson contributed to the *Procedures to Implement the Hazard Analysis Critical Control Point System* (1991) and *Procedures to Investigate Foodborne Illness, Fifth Edition* (1999). His most recent work, five papers on outbreaks caused by food workers, can be found in *Journal of Food Protection*.

Maurice Weber Laboratorian Award

The recipient of the IAFP 2007 Maurice Weber Laboratorian Award is Dr. Bala Swaminathan. 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.

Bala Swaminathan
Atlanta, Georgia

Stan Bailey (left) and Fred Weber of Weber Scientific (right) present Bala Swaminathan with the 2007 IAFP Maurice Weber Laboratorian Award.

Dr. Bala Swaminathan led a prolific career that has notably impacted food safety and public health. Dr. Swaminathan earned his BSc degree from Delhi University, and his MS and Ph.D. degrees from the University of Georgia. He went on to teach for nine years at Purdue University before joining the Centers for Disease Control and Prevention (CDC). During his 20-year tenure at the CDC, Dr. Swaminathan conceived, developed, and implemented PulseNet, the nationally and internationally acclaimed molecular subtyping network for foodborne disease surveillance. After 2001, he was responsible for implementing CDC's Bioterrorism Preparedness Initiative as it pertains to diagnostic methods for foodborne pathogens and their toxins. In December 2006, he retired from his final position at the CDC as Acting Senior Advisor for Laboratory Science in the Division of Foodborne, Bacterial and Mycotic Diseases.

Dr. Swaminathan has published more than 120 peer-reviewed research papers and reviews, and has presented as an invited lecturer at more than 70 national and international meetings. He is the recipient of many awards including the CDC/ATSDR Honor Award (1997); Innovations in American Government Award (1998 and 2002); CDC Senior Biomedical Research Service Award (1998); Sigma Xi Walter R. Dowdle Award for Achievement in Public Health Science (2000); and the Association of Public Health Laboratories' on the Frontline Award (2004) and Presidential Award (2006).

From 1998 to 2002, Dr. Swaminathan served on the National Advisory Committee on Microbiological Criteria for Foods. He is currently a consultant to the World Health Organization and the Institute for Environmental Health, and a Science Advisor to the Technical Committee on Food Microbiology of the International Life Sciences Institute–North America.

International Leadership Award

This award is being presented to Dr. Leon Gorris 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. Dr. Gorris is being honored for advancing the science of food safety internationally, for serving as leader and diplomat in bringing the diverse needs of developing countries to the table, and for finding practical solutions to those problems.

Leon Gorris

Sharnbrook, United Kingdom

Joe Shebusk of Cargill (left) and Frank Yiannas (right) present Leon Gorris with the IAFP 2007 International Leadership Award.

As a Risk Assessment Expert for Unilever, Dr. Gorris leads science and technology developments regarding risk assessment utility in industry contexts. He has co-authored more than 65 refereed articles and more than 90 papers in proceedings or books, and has delivered over 100 oral presentations around the world.

Dr. Gorris holds the European Chair in Food Safety Microbiology at the University of Wageningen (NL), a 20 percent professorship. He is a member of the International Commission on Microbiological Specifications for Foods (ICMSF), heading their Codex Alimentarius Committee for Food Hygiene delegation. For ILSI-Europe, he chairs the Publication Committee, and is a member of the Scientific Advisory Committee. He provided technical content and training for FAO/WHO projects and has been invited to consultations. His particularly rewarding projects have been through the Industry Council for Development (ICD), which supports technology transfer and education in food and water safety and quality, focusing primarily on developing countries. His most recent projects with ICD have involved Microbiological Risk Assessment and Risk Analysis. Dr. Gorris is a professional member of the Institute of Food Technologists; the Society for Applied Microbiology; and The Netherlands Society for Microbiology and Society for Risk Analysis.

In his contributions to IAFP, Dr. Gorris serves on the Editorial Committee for *Journal of Food Protection*, the Management Committee for *Food Protection Trends*, and has chaired the Microbial Risk Analysis Professional Development Group. He was instrumental in organizing the first two European Symposiums in Prague (2005) and Barcelona (2006), and chairs the Organizing Committee for the 2007 IAFP European Symposium.

Food Safety Innovation Award

This award is presented to an individual or organization for creating a new idea, practice, or product that has improved public health and quality of life by making a positive impact on food safety. The Microbiology Laboratory Staff is being recognized for its innovation in developing and optimizing the recirculating immunomagnetic separation (RIMS) technique for identifying *E. coli* outbreak strains from food environmental samples.

Microbiology Laboratory Staff of the California Department of Health Services, Food and Drug Laboratory Branch (FDLB)

Richmond, California

Frank Yiannas (left) and Karen Mullery, 3M Microbiology, (right) present Sunee Himathongkham with the IAFP 2007 Food Safety Innovation Award.

Established in 2003, the Microbiology section of the FDLB of the California Department of Health Services (CDHS) is devoted to finding rapid methods for the isolation and identification of foodborne pathogens. This section of the FDLB is led by Leta Crawford-Miksza, Ph.D, MPH. The senior scientists are Sunee Himathongkham, DVM, MPVM, Ph.D.; Paul Park, Ph.D.; and Michele Jay-Russell, DVM, MPVM. The staff microbiologists, supervised by Linda Guthertz, include Mary Lee Dodd, Alexandru Badoiu, Olivia Badoiu, and Raymond Bryant.

The recirculating immunomagnetic separation (RIMS) methodology development was originally a cooperative project between the CDHS Food and Drug Laboratory Branch staff, led by Sunee Himathongkham, and the US Food and Drug Administration's San Francisco District Laboratory team, led by David Lau. Optimization of the method and field testing was performed by the CDHS Food and Drug Laboratory Branch staff.

The optimized method was used exclusively during the 2006 *E. coli* O157:H7 traceback investigation of the outbreaks implicating spinach, milk, and lettuce. Using this method, the molecular pattern of the strains isolated from the environment matched the patient outbreak strain for the first time.

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.

Rebecca Robins, (left to right) Ivan Nastasijecic, Rebecca Goulter, Haley Oliver and Hyun-Ho Jin receive the Student Travel Scholarship Award.

Rebecca Goulter

University of Queensland
Brisbane, Australia

Rebecca Goulter is a fourth-year student at the University of Queensland in Brisbane, Australia. With primary interests in food safety and food microbiology, she hopes to earn her Bachelor of Food Technology degree with first-class honors this year. Currently employed as a casual research assistant Food Science Australia, Ms. Goulter will continue her career in research by pursuing her Ph.D. beginning in 2008.

As recipient of the WJ Puregger Prize in Food Microbiology in 2005 and a Commonwealth learning scholarship in 2006, Ms. Goulter is dedicated to excellence in her studies, and strives to continue achieving at this level. Under Dr. Gary Dykes, she is presently contributing as co-writer of a text book chapter on the epidemiology of *Listeria monocytogenes*. The book, entitled "Handbook of *Listeria monocytogenes*," is expected to be a major food industry resource for up-to-date research concerning this pathogen. Her present research for FSA and Meat and Livestock Australia, involving the study of time and temperature combinations on the microbiological quality of knives, aims to provide the industry with a cost- and energy-efficient method for cleaning knives.

As a participant at IAFP 2007, Ms. Goulter seeks to increase her knowledge and share discussion of her interests with fellow scientists and students. She considers her book project and the IAFP 2007 Student Travel Scholarship to be rare opportunities she feels privileged to experience as an undergraduate.

Hyun-Ho Jin
Chung-Ang University
Seoul, Republic of Korea

Hyun-Ho Jin is a candidate for a Master's degree in Food Science at Chung-Ang University in South Korea, where he received his BS in Food and Nutrition in 2006. Upon completion of his present program, he intends to pursue his Ph.D. in Food Microbiology and Safety in the US.

Mr. Jin served in the Marine Corps (2001–2003) during the course of his undergraduate studies, and received Honored Scholarships at Chung-Ang University in 2004, 2005, and 2007. As a Teaching Assistant for the Food and Nutrition Department, his many subjects include gram staining, growth curve, isolation of foodborne bacteria, and carbohydrate fermentation. Under Dr. Sun-Young Lee, whose food microorganism teaching became the "turning point" of his life, Mr. Jin's research in food sanitation and safety has encompassed modified atmosphere packaging (MAP) to control foodborne pathogens in fresh produce, work with *Enterobacter sakazakii*, and the study of acidothermophilic bacteria in sugar concentrate.

The recipient of CAU's 2005 Travel Award and two Research Assistant Scholarships (2006), Mr. Jin has also achieved certificates in hygiene (2006) and dietetics (2007). In 2006, Mr. Jin won the graduate student technical poster competition of The Korea Society of Food Hygiene and Safety. To date, he is the co-author of seven poster presentations, four of which will be featured at IAFP 2007.

Ivan Nastasijevic
University of Novi Sad
Beograd, Serbia

Ivan Nastasijevic is a developing food safety scientist with a DVM and an MS degree in Biochemical Sciences from Belgrade University. His ongoing Ph.D. thesis, "Risk Assessment and Risk Mitigation Options for *E. coli* O157 in the Beef Chain" will be completed at the University of Novi Sad in Serbia.

A Quality Assurance Manager and Meat Safety Extension Specialist at Serbia's Institute of Meat Hygiene and Technology, Mr. Nastasijevic is committed to the advancement of public health. His current research involves the development of generic HACCP plans for the slaughter, deboning, and dispatch of meat from bovine, pigs, and poultry; and the study of *E. coli* O157 through Longitudinal and Integrated Safety Assurance, which implements a synergistic and holistic approach to the enhancement of meat hygiene.

Mr. Nastasijevic has facilitated National Training Courses for Government Veterinary Services. Presently, he organizes and facilitates International Training Courses in the field of epidemiology, food safety management systems, and HACCP for the Mediterranean Zoonoses Control Center (WHO/MZCC) of Athens, Greece. He has authored or co-authored 10 scientific/review papers and posters; one manual and one guideline for the meat industry; 24 presentations and lectures nationally and internationally for WHO/MZCC; and two lectures for undergraduate students at the University of Novi Sad. He is a member of IAFP, WHO/MZCC, National Project Team for Risk Assessment of *E. coli* O157 in the beef meat chain, and the Veterinary Chamber of Serbia.

Haley F. Oliver
Cornell University
Ithaca, New York

Haley Oliver is a Ph.D. student in Food Science at Cornell University, where she is concentrating in Food Microbiology with minors in Microbiology and Epidemiology. Under the direction of Dr. Kathryn Boor, she is using molecular techniques, including gene expression microarrays, to assess contributions to stress response and virulence in *Listeria monocytogenes* lineages I, II, IIIA, and IIIB. Since distinct genetic lineages within *L. monocytogenes* are associated with different relative abilities to cause human listeriosis, her objective is to help the food industry, especially ready-to-eat food producers, tailor pathogen control and intervention strategies to target strains that are more likely to represent a significant human health risk.

Ms. Oliver received BS degrees in Microbiology and Molecular Biology at the University of Wyoming. Her undergraduate research project with Dr. Kurt Miller was partially funded by The Experimental Program to Stimulate Competitive Research Program, sponsored by the National Science Foundation at the University of Wyoming, and the McNair Scholars Program, supported by the Department of Education. While at Cornell, she has received an IFT Graduate Fellowship, the Cornell Olin and Clinton DeWitt Smith Fellowships, and the Kosi Award in Food Science. Upon completion of her Ph.D., Ms. Oliver intends to pursue a post-doctoral position with the United States Department of Agriculture or the Centers for Disease Control and Prevention before securing an academic position with a research institution.

Rebecca C. Robbins
North Carolina State University
Raleigh, North Carolina

Rebecca Robbins is a candidate for doctorate degrees in Veterinary Medicine and Comparative Biomedical Sciences in the College of Veterinary Medicine at North Carolina State University in Raleigh, NC. Born and raised in North Carolina, Ms. Robbins also received undergraduate training at NCSU, researching the role of chicken macrophages in the pathogenesis of Marek's Disease. She graduated Summa Cum Laude in 2004 with BS degrees in Poultry Science and Biological Sciences.

With expected completion in 2010, Ms. Robbins' current combined degree program reflects her concentration in population medicine and veterinary public health. Her thesis project, "Alternatives to Antimicrobial Use in Swine Production and Their Effect on Antimicrobial Resistant *Salmonella*," encompasses population medicine, molecular biology, epidemiology, and risk assessment to address issues surrounding antimicrobial resistant *Salmonella*. The mission of Ms. Robbins' research is to identify pre-harvest food safety strategies that promote swine health while reducing antimicrobial resistant pathogens in pork and pork products. Upon graduation, she intends to pursue research in a division of the USDA, such as FSIS, that targets international food safety issue.

Ms. Robbins looks forward to presenting her poster, "Comparison of Real-time PCR to Gold Standard Culture Method for Quantification of Ampicillin Resistant *Salmonella* Typhimurium from Swine Feces" to colleagues involved in food safety and protection at IAFP 2007. She is honored to be a recipient of this year's Student Travel Scholarship Award.

Sponsored by IAFP FOUNDATION

GMA–FPA Food Safety Award

The recipient of the 2007 GMA–FPA Food Safety Award is Dr. John N. Sofos. This award honors an individual's long history of outstanding contributions to food safety. Regarded as an effective and enthusiastic leader with exceptional communication skills, Dr. Sofos' career accomplishments have significantly impacted and improved the safety of the US food supply and advanced the field of food microbiology.

John N. Sofos
Fort Collins, Colorado

Craig Henry (left) representing GMA–FPA and Frank Yiannas (right) present the GMA-FPA Food Safety Award to John N. Sofos.

Dr. John N. Sofos holds a BS degree from the Aristotle University of Thessaloniki, Greece, and MS and Ph.D. degrees from the University of Minnesota. His current title is University Distinguished Professor at Colorado State University, where he teaches courses in meat and food safety. Dr. Sofos' research deals with the ecology, detection, stress-resistance, and control of bacterial pathogens in foods. He has authored, or co-authored with his students and collaborators, over 220 refereed journal papers; 54 book chapters; 6 books; 300 abstracts and numerous other publications; and has presented more than 140 invited lectures both nationally and internationally. Under Dr. Sofos' guidance, graduate students commence their own food safety careers with remarkable training and knowledge.

Included on the list of Highly Cited Scientists of Thomson Scientific, Dr. Sofos is also a Fellow of the American Academy of Microbiology, the Institute of Food Technologists, the American Society of Animal Science, and IAFP. His numerous awards include the Distinguished Research Awards from the American Meat Science Association and the American Society of Animal Science; the IAFP Educator Award and President's Recognition Award; and the USDA Secretary's Honor Award for Superior Service. He is currently a member of the US National Advisory Committee on Microbiological Criteria for Foods, and serves as a Scientific Editor for the *Journal of Food Protection.*

Sponsored by GMA FPA FOOD PRODUCTS ASSOCIATION

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, Emilio Esteban (right) with the Developing Scientist Award Winners (left to right) Oleksandr Byelashov, Faith Critzer, Matthew Ranieri and Julie McKinney. Wannasawat Ratphitagsanti and Darryl Black were not present.

ORAL

1st Place – Oleksandr Byelashov

2nd Place – Faith Critzer

3rd Place – Matthew Ranieri

POSTER

1st Place – Wannasawat Ratphitagsanti

2nd Place – Darryl Black

3rd Place – Julie McKinney

Affiliate Awards

Maria Teresa Destro, Affiliate Council Chairperson with Affiliate Award Winners (left to right) Steve Murphy, New York State Association for Food Protection; Mariza Landgraf, Brazil Association for Food Protection; Terry Peters, British Columbia Food Protection Association; Maria Teresa Destro, Joseph Odumeru, Ontario Food Protection Association and Stephanie Olmsted, Washington Association for Food Protection.

C. B. SHOGREN MEMORIAL

Brazil Association for Food Protection

BEST AFFILIATE ANNUAL MEETING

Washington Association for Food Protection

BEST AFFILIATE EDUCATIONAL CONFERENCE

New York State Association for Food Protection

BEST AFFILIATE COMMUNICATION MATERIALS

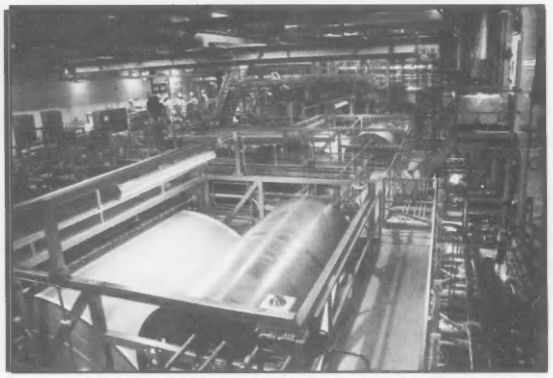
British Columbia Food Protection Association

AFFILIATE MEMBERSHIP ACHIEVEMENT

Ontario Food Protection Association

Food Safety at Beef Products, Inc.

Dakota Dunes, South Dakota



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 2007 Black Pearl Award was Beef Products, Inc.

Food Safety Initiatives at BPI

BPI believes that its quality-assurance procedures are among the best in the industry. Raw materials are purchased only from approved suppliers and must meet BPI's raw material specifications. Incoming raw materials are inspected by trained BPI employees to ensure consistency and quality, and microbiological results are monitored by BPI's Quality Assurance department. The actual manufacturing process is basically a "closed" system, which drastically reduces potential introduction of contaminants. Finally, the company's finished product sampling and testing program is the most rigorous in the industry, with samples taken from virtually each finished carton. Composite samples are collected throughout the day and sent to independent laboratories for microbial testing. No product is released for shipment until acceptable test results are received. Like its production process, BPI has also been a pioneer in this "test and hold" program.

At BPI, food safety is more than an afterthought. Food safety is a critical element in the design and construction of each BPI facility. Food safety is so vital that nearly 20 percent of the total cost to construct BPI's South Sioux City facility went directly into sanitation and food safety related items. For example, outside air is washed, refrigerated, and sanitized before entering the processing room. The chilled air creates positive pressure within the processing room that, we believe, prevents contaminated air from entering the processing area. This eliminates the need for refrigeration coils, which can harbor bacteria.

Each BPI facility uses clean-in-place sanitation systems. Spray misters are located below and above the conveyor systems allowing for continuous sanitation. In addition, all floor and wall-mounted items are separated from surface areas by sealed stand-offs, making it possible to clean behind stationary items. No less than two metal detectors are used during the process to ensure safety.

BPI's finished product sampling and testing program is the most rigorous in the industry, assuring our customers of product quality and safety. The sampling and testing program was recently evaluated by Iowa State University Microbiology and Statistics departments in conjunction with BPI's re-assessment of its HACCP plans. The reviewers commented that:

> *BPI's sampling and testing program is currently the most rigorous program in the industry I am aware of....The sampling and testing program managed by BPI is in fact statistically superior (to other programs sometimes referred to by USDA as models for the industry), with higher probabilities of detection at all projected population levels for* E. coli O157:H7.

Pathogen Reduction

BPI's innovating pathogen reduction process has become a model for the industry to follow. In two independent process validation studies conducted by Iowa State University and National Food Laboratory, Inc., the BPI process eliminated all *E. coli* O157:H7 in the inoculated product, as well as producing significant reductions of *Salmonella* and *Listeria monocytogenes*. The Iowa State study has been published in the *Journal of Food Protection*. The following chart summarizes the results of those two studies.

All data above represent Log_{10} bacterial population or reduction in population resulting from each processing step.

Commitment Extended

Still, because of the potential risks associated with raw meat products, BPI has long advocated rigorous, finished product "test and hold" programs. To BPI, test and hold is a tool that is used each and every day to evaluate the effectiveness of other food safety initiatives.

	Iowa State Study			National Food Lab Study		
	E. coli O157:H7	*Salmonella*	*Listeria mono.*	*E. coli* O157:H7	*Salmonella*	*Listeria mono.*
Inoculated Product Step 1	6.0	6.0	5.0	7.10	6.97	7.22
Enhanced pH Step 2	3.0	4.0	0.5	.69	1.02	.02
Freeze/stress Step 3	No	Separate	Pathogen	.74	.64	.05
Compression Step 4	Reduction	Data	Available	1.40	1.04	.39
Frozen grind	For	These	Steps	>4.27	3.27	1.10
Total Reduction	6.0	6.0	3.5	>7.10[1]	5.95	1.55

As a strong advocate of finished product "test and hold" programs, BPI continuously encourages its customers to adopt these programs as well. One way to encourage customers to make use of these food safety tools, while limiting their risk in the process, is through BPI's "Test and Hold Buyback Guarantee." If a US processor used BPI's pH-enhanced product at a minimum 15% incorporation level, and:

- All other raw materials meet industry expectations; and
- The processor conducts BPI-audited facility environmental analysis; and
- Uses BPI recommended grinding and blending methods; and
- Is willing to test and hold for *E. coli* O157:H7 using BPI's extensive sampling and testing methods;

then, if test results are positive for *E. coli* O157:H7, BPI will buy that production from its customer.

Future Developments

Use of BPI's food safety innovations will open additional, future markets for the Company. The Company is beginning an in-plant trial on use of its technology to treat beef carcasses in holding coolers prior to processing; new methods for treatment of trimmings destined for ground beef operations; innovations in injection technologies for enhancing whole muscle meats; and developing new flavorful, low fat meats. BPI is also seeking other means of adding value to current production activities and products. For instance, the Company recently funded human trials conducted by the University of Nebraska on a cholesterol-lowering compound derived from edible beef tallow components.

BPI's history and its future are both testaments to the value of food safety. The Company's ability to differentiate itself on the basis of its food safety initiatives in the past, and the new markets being opened for BPI in the future, underscore the Company's philosophy that "food safety is profitable."

[1]The four process steps including pH enhancement, freeze/stressing, block compression, and customer frozen block grinding (1/4 inch preferred).

[2]National Food Laboratory, Inc. determined the reduction potential for *E. coli* O157:H7 was > 8.50 log.

Ivan Parkin Lecture

It's the Science, Stupid

Reflections on 41 Years as a Food Microbiologist

Presented by Carl S. Custer

Food Microbiologist

Bethesda, Maryland

Several years ago, Elsa Murano, then the USDA Undersecretary for Food Safety visited our FSIS program (Office of Public Heath and Science) to give an update on issues. She mentioned that there were political pressures she had to buck to continue promoting the food safety programs. After she finished, I spoke up and reminded her that FSIS had a contest for a motto and my suggestion would be, "Science is our foundation. Logic is our pathway, but Politics is our millstone." Dr. Murano laughed heartily but, the reaction of the senior FSIS officer present was the opposite. That was expected, Senior Executive Service (SES) officials rarely buck political pressure.

Therefore, I had an agenda in delivering the Ivan Parkin lecture and drafting this article. It is to persuade you as food safety scientists to be advocates of Science and Logic for food safety in the face of politics, policy and marketing because Science and Logic are good for public health, good for business, and good for the general welfare.

Here is a brief background. In 1972, I joined the new supersized USDA Agency "APHIS." Like most newbies, I did "Grunt work" for a couple of years before inheriting the Canned Food Lab and expanding it into the Special Projects Lab. It was a great opportunity to work on the diverse epidemiology samples and I became an expert on *Clostridium botulinum*.

In 1980, I moved to headquarters to provide the scientific basis for regulatory development and enforcement. Some of my early projects included, staphylococcal enterotoxin in fermented sausages, inhibiting nitrosamines in bacons, and inactivating salmonellae in cooked and dried beef products. When the veterinarian in our branch left for greener fields, I was given his trichina projects. That opened up new worlds of products for me, especially dry cured meats, and nineteenth-century prescriptive regulatory philosophy.

I focused on salmonellosis as the major foodborne hazard at that time but was continually amazed that trichina & botulism earned more attention from both the government and industry. In contrast, it took a major outbreak for *Salmonella* to get serious attention.

A quick comparison of these two hazards shows they are less based on public health impact than beliefs, history and politics.

Trichina: *Trichinella spiralis*, a nematode.
Trichinella cysts are less heat resistant than bacteris
They cannot multiply outside a host, unlike bacteria
While the infective dose is similar to bacteria, it requires a male and female to multiply

On the other hand:

Trichinosis was an early food safety concern thus, is notable.
Trichina control is governed by Draconian 19th century rules.
Worms are less aesthetically acceptable.

Botulism: Caused by the toxin from *Clostridium botulinum*
The toxin is the most deadly foodborne toxin
CDC reports show more are killed by salmonellosis

On the other hand:
Botulism was an early food safety concern thus, has notoriety.
The nitrite-nitrosamine "issues" gave botulism political weight.
Time and space prevent me delving farther into the botulinal-nitrite issues.

Returning to trichina, here are examples of the rules governing that nematode in 9 CFR 318.10. There are three basic paragraphs: (a) list the products, that do not require treatment, (b) lists products and a criterion for requiring treatment, and (c) prescribes the treatments.

Paragraph (a) exempts obviously raw pork and pork that has been tested to be free of *Trichinella spiralis* – however – other more prevalent pathogens, such as *Salmonella*, are not addressed.

Paragraph (b) begins with, "*Products named in this paragraph*, and products of the character hereof, containing pork … *shall be effectively heated, refrigerated, or cured to destroy any possible live* trichinae." Other pathogens are not included.

The paragraph continues with a list of products, "Bologna, frankfurter, breaded pork products, bacon for wrapping… ." Then paragraph (b) defines the criterion: "*… that the product might be eaten rare or without thorough cooking because of the appearance of the finished product* or otherwise."

The third paragraph prescribes the treatments for inactivating trichinas. Following are those three subparagraphs and an approximation of the effect on salmonellae:

(c)(1) Heating: (~<2 D *Salmonella* kill)
(c)(2) Freezing: (~2 D *Salmonella* kill)
(c)(3) Curing:
(i) dry sausages,
(ii & iii) shoulders,
(iv) dry-cured hams
(Great variance *Salmonella* survival reported)

In summary, the trichina-treatments have some lethal effect on bacterial pathogens. Thanks to low pathogen levels, robust immune systems, less than perfect reporting, and luck, they are usually good enough. However, as epidemiology shows, they are not always good enough.

In the early 1980's FSIS began amending the trichina regulations. This included putting "MPI bulletins" and proprietary "approvals" into the regulations. One approval was revalidated by Swift and became "Method No. 7" in the sausage treatments. It included a 125°F heat treatment that ARS scientists Sam Palumbo and Jim Smith had shown to be effective against *Salmonella*.

I had suggested that FSIS amend 318.10 by replacing "trichinae" with pathogens. Subsequent outbreaks would support that opinion. I also suggested labeling raw pork products to eliminate need for freeze treatment and thus, address other pork-borne hazards. The rationales for rejection were that trichina has a regulation and would require major rule-making and that labels are unreliable. FSIS would later reverse its opinion on labeling.

The last attempt to address the inadequacy of the trichina treatments was a 1991 proposed cautionary statement for the prescribed treatments. Because *Salmonella* survival had been reported in both the scientific literature and surveys, FSIS proposed the following cautionary statement:

> "The treatments prescribed in the following paragraphs have been determined to destroy trichinae cysts in pork; however, they may not destroy pathogenic bacteria. The establishment may need to use additional heating, acidification, fermentation, salting, or drying to inhibit and destroy pathogenic bacteria."

Two industry associations commented against the cautionary statement. They claimed processors were knowledgeable of the limitations of the prescribed trichina treatments and claimed the FSIS citations were insufficient. One opined the cautionary statement would promote inspector mischief and concluded that FSIS has the authority to address adulteration. However, FSIS did not and would not systematically sample these products for years.

It was not a time for consumer advocacy. In the final rule, FSIS wrote "The Agency agrees that the cautionary statement, on balance, is best removed from the trichinae control section of the regulations as essentially irrelevant to the control of trichinae." June 22, 1992.

It was true, the cautionary statement did not affect trichina treatment but it could affect public health. It was a low point of my career. My supervisor, Dr. Al Liepold gave me a piece of advice that I recommend to you. It was, "Wave the flag, but if the train keeps coming, get off of the track."

The train fell off of the track sooner than expected. In August 1992, former IAFP President Kathy Glass authored, "Fate of *Escherichia coli* O157:H7 as Affected by pH or Sodium Chloride and in Fermented, Dry Sausage. Applied Environmental Microbiology. 1992 August; 58(8): 2513–2516. One conclusion was, "…this organism can survive fermentation, drying, and storage of fermented sausage regardless of whether an added starter culture was used." FSIS' opinion was that was beaker sausage, not real dry sausage.

December 1994 showed *Escherichia coli* O157: H7 could survive in a real dry sausage processed in full compliance with the FSIS trichina treatments and the AMI fermentation GMPs.

Escherichia coli O157:H7 Outbreak Linked to Commercially Distributed Dry-cured Salami – Washington and California, 1994.

"From November 16 through December 21, 1994, a total of 20 laboratory-confirmed cases of diarrhea caused by *Escherichia coli* O157:H7 were reported to the Seattle-King County Department of Public Health.… Epidemiologic investigation linked *E. coli* O157:H7 infection with consumption of a commercial dry-cured salami product distributed in several western states."

Industry's and FSIS' responses were positive and immediate. One of the most effective was "Dry Fermented Sausage and *E. coli* O157:H7 Research Report No. 11-316" by the Blue Ribbon Task Force, National Cattlemen's Beef Association. It was published in 1997 but implemented much earlier. The research was conducted by John Luchansky at the Food Research Institute. The methods were based on Swift's dry sausage Method No. 7.

The industry associations encouraged members to adopt the FRI processing methods. However, a 1997 survey showed there were 49 "hold outs." FSIS' response was the first microbiological testing of fermented sausages for *Salmonella* and *Listeria monocytogenes*.

Slide 23 of my lecture on the IAFP Web page shows the results of FSIS testing fermented sausages from August 1997 through 2004. The sampling was weighted so 75% of the samples were the "hold outs" and 25% were randomly selected. In the first four months, 4% of the sausages were positive for *Salmonella* and 9% were positive for *Listeria monocytogenes*. By 2003, there were no more positives. These results showed that contrary to "conventional wisdom," dried fermented sausages could be processed to eliminate *L. monocytogenes*. Also, that the 1997 results were likely typical before implementing the FRI processes and is another piece of evidence that less than "Zero Tolerance" could be acceptable.

Pork Labeling Part II:

In the early '90s, a review of mettwurst and teewurst sausage processes revealed no "kill-step" for bacterial pathogens but, only the prescribed freeze treatment for trichina. A quick microbiological survey of the products showed about 15% were positive for *Salmonella*, *L monocytogenes*, or both. The FSIS solution was for the processors to heat treat the product or label it with cooking instructions.

This labeling of pork products leads us to poultry products that "*might be eaten rare or without thorough cooking because of the appearance of the finished product.*"

The following is excerpted from an April 21, 2005 News Release:

Salmonella cases linked to frozen chicken entrees

- Minnesota Department of Health
- Four cases of salmonellosis in Minnesota have been linked to frozen, prebrowned, single-serving, microwavable stuffed chicken entrees…
- The items identified in the outbreak, such as chicken broccoli and cheese, and possibly chicken Kiev and chicken cordon bleu…
- "These items are breaded, prebrowned and individually wrapped, so it's possible someone could have mistakenly assumed they have been precooked,"… "Although the wrapper includes instructions to fully cook the product, some consumers might have overlooked that information and simply heated it in a microwave…"
- "While we've identified one line of products in this case, the problem has to do more with the labeling and cooking instructions than with the product itself."

In contrast to poultry, an earlier outbreak implicating partially cooked beef patties led to the following rule: Safe Labeling Beef Patties 9 CFR 318.23 (c) (4).

> "Partially cooked patties must bear the labeling statement "Partially cooked: For Safety Cook Until Well Done (Internal Meat Temperature 160 degrees F)." *The labeling statement must be adjacent to the product name, and prominently placed with such conspicuousness* (as compared with other words, statements, designs or devices in the labeling) as *to render it likely to be read and understood* by the ordinary individual under customary conditions of purchase and use." Char-marked patties are covered in the next paragraph.

After the second outbreak from raw processed poultry, we again strongly recommended to the FSIS Standards and Labeling Division that these products be conspicuously labeled "raw". The reply was the industry does not like "raw" but prefers "uncooked".

For examples of "uncooked" labels on raw poultry products, I went to my home freezer. The Ivan Parkin lecture slides on the IAPF Web page, slides 30–34 show examples of "Uncooked" labels. To be fair, the back of the package is far more descriptive than the front. But you must wonder what they're thinking to make "Larger 4.5 Bag" more conspicuous than that the product is raw.

Contrast the uncooked warning with the FSIS requirement to warn the consumer that the product had been previously frozen:

> Frozen Poultry Labeling: 9 CFR 381.129 (6)
> (ii) Raw poultry product whose internal temperature has ever been at or below 0°F must be labeled with the descriptive term "frozen," … *The descriptive term must be prominently displayed on the principal display panel of the label.* If additional labeling … it must be prominently affixed to the label. The additional labeling must be so *conspicuous* – that it is likely to be read and understood by the ordinary individual under customary conditions of purchase and use.

FSIS has taken no action to improve labeling for public heath purposes.

'O Freunde, nicht diese Tone!':

Enough of my carping about problems; there are things we can do. In fact, as scientists I believe we have the duties to:

> Develop new knowledge – research
> Disseminate knowledge – teach
> Use science and logic in the face of myths and prejudices

There are barriers to us accomplishing these tasks but for each barrier, there are solutions:

For ignorance there is knowledge; for beliefs there are facts; for inertia there are liability, competition, and the possibility of "60 Minutes" knocking on the door.

What about evilness? I am a believer in Hanlon's Razor: "Never attribute to malice what can be adequately explained by ignorance or stupidity." Contrary to Dilbert comics, the vast majority of managers and policy makers are not stupid. They've attained their position because they are smart – but – they may be ignorant of the science that you, the scientist can, and should provide. They are also subject to the human condition – which brings me to Sir Francis Bacon.

Almost 400 years ago, Sir Francis Bacon, cribbing from earlier philosophers, wrote, "The human understanding is no dry light, but receives an infusion from the will and affections; whence proceed sciences which may be called 'sciences as one would.' For what a man had rather were true he more readily believes. Therefore he rejects difficult things from impatience of research… things not commonly believed, out of deference to the opinion of the vulgar." Novum Organum.

Also, 400 years ago, William Shakespeare wrote, "Ignorance is the curse of God, knowledge, the wing wherewith we fly to heaven."

We have all experienced the problems caused by ignorance and the want to believe what we wish were true and have seen it occur in others. This brings me to the "Agenda."

The Agenda:

Advocate public health science whether you're in academia, industry, or government. Be current on public health and science. Be able to explain both the science and the risks. Have the spinal fortitude to articulate the hazards. It will be good for business, for public health, and good for the "General Welfare."

By the authority given the Ivan Parkin Lecturer, I appoint you, the reader of this article, as ambassadors of food safety by taking the pledge.

"Science is our foundation and logic is our pathway to influence politics, policy, and marketing. We shall wave the flag of science and logic but if the train keeps coming, we will get off of the track."

The John H. Silliker Lecture

Trends in Food Safety Management

Presented by Dr. Terry A. Roberts

Food Safety Consultant

Reading, England

My intention is to review three areas that I am proud to have been associated with: (i) the International Commission on Microbiological Specifications for Foods (ICMSF); (ii) serving as a member of the EFSA Panel on Biological Hazards in Europe; and (iii) developing modelling of microbial growth and survival in foods.

I. THE ICMSF

Despite the widespread implementation of HACCP and a range of Good Practices (Veterinary, Hygienic, Manufacturing), and greatly improved controls during food processing and distribution, much reliance is still placed on microbiological criteria. Through my invited membership, and later Chairmanship, of the ICMSF, I was fortunate to participate in discussions and developments in food microbiology and food safety with some of the leaders in microbiology research from many countries. While serving as a member of the ICMSF I had the pleasure of working with John Silliker, getting to know him and to recognize his breadth of knowledge and wide experience.

Since its formation in 1962, the ICMSF has built a rich history of books in the series "Microorganisms in Foods" with widespread appeal, and addressing a series of key topics at the time of publication, all with the aim of improving the safety of foods in international trade. Although standardization of the methods used in the microbiological testing foods had been greatly improved, the framework for setting microbiological criteria and the statistical sensitivities of sampling plans were poorly understood by the average food microbiologist. Microorganisms in Foods 2: Sampling for Microbiological Analysis: Principles and Specific Applications (1974, 1978 revised, 2nd ed. 1986) laid a framework for establishing sampling plans and explained their limitations. Both the severity of the illness caused by the hazard (the microorganism) and the conditions of use of the food were taken into account. When the hazard is reduced or eliminated by cooking the food, the sampling plan is less severe than when the hazard can multiply in the stored food.

At an early stage, the ICMSF recognized that no feasible sampling plan can ensure the absence of a pathogen in food and that testing foods at ports-of-entry, or elsewhere in the food chain, cannot guarantee food safety. This led the ICMSF to address the Hazard Analysis Critical Control Point System (HACCP) for enhancing food safety. The principles of HACCP and the way that HACCP plans should be developed were elaborated (ICMSF, 1988). The importance of controlling the conditions of producing/harvesting, preparing, and handling foods was explained, with examples of how HACCP can be applied at each step in the food chain. Critical Control Points (CCPs) were termed CCP1 when a process eliminated a hazard (e.g. cooking) and CCP2 if the process merely prevented multiplication (e.g. chilling).

The ICMSF next recognized that a major weakness in developing HACCP plans is the process of hazard analysis. It has become difficult to be knowledgeable about the many biological agents recognized as responsible for foodborne illness. ICMSF (1996) summarizes important information about the properties of the biological agents commonly involved in foodborne illness and serves as a quick reference manual whean making judgments on the growth, survival, or death of pathogens.

Subsequently, the Commission updated its volume on the microbial ecology of food commodities (ICMSF, 1998, 2nd ed. 2005).

Microorganisms in Foods 7: Microbiological Testing in Food Safety Management (2002), illustrates how systems such as HACCP and various "Good Practices" provide greater assurance of safety than microbiological testing, but also identifies a wide range of circumstances where microbiological testing plays a critically important role in achieving and maintaining microbiological safety of foods.

II. THE EUROPEAN FOOD SAFETY AUTHORITY PANEL ON BIOLOGICAL HAZARDS

The European Food Safety Authority (EFSA) was founded in 2002 and took over the responsibilities of several committees in the European Union, including the Scientific Committee on Veterinary on Measures Related to Public Health (SCVPH). Its mission is to provide scientific advice and technical support for European community legislation and the safety of food and feed. Requests for information arrive from the European Commission, the European Parliament and Member States. The Panel on Biological Hazards is one of nine, and deals with foodborne zoonoses, microbiology, food hygiene, transmissible spongiform encephalopathies and associated waste management. Requests for information are considered by Working Groups resulting in "Opinions" which can be accessed at www.efsa.europa.eu.

In recent years, the philosophy behind food control in the EU has changed markedly to an integrated approach including the precautionary principle, with food operators responsible for safety and traceability through production, processing and distribution. Measures taken should be based on risk analysis, but the depth of that analysis is

not specified. Attempts to make a full Quantitative Microbiological Risk Assessment have proved difficult and a qualitative approach is being considered. From 2006, only two types of microbiological criteria are included in EU legislation: *viz* (i) "food safety criteria" when detection of particular pathogens constitutes failure and the food must be removed from the market, and (ii) "food process criteria" when detection of a microorganisms at levels exceeding those laid down results in corrective actions at some point in processing.

III. MODELLING MICROBIAL GROWTH AND SURVIVAL IN FOODS

Modelling microbial growth is long-established in biotechnology, seeking to maximize growth and yield by optimizing the conditions of growth. Modelling microbial growth in foods differs in trying to model relatively low concentrations of microorganisms. Microbial hazards in foods are numerous, and understanding the growth response of each hazard in the wide range of foods where they are a concern is an impossible task. Attempting to build a database from the scientific literature (e.g. see ICMSF, 1996) revealed a wealth of information on the effects of temperature and water activity, although not always systematic, and a dearth of systematic information on pH and other controlling factors.

Our investigations at the Institute of Food Research of the relative importance of the many factors controlling *Clostridium botulinum* in cured meats, a complex environment, revealed, to our surprise, that most of the inhibitory effect could be explained by a few single factors (sodium nitrite, incubation temperature, ascorbate/isoascorbate), with interactions not statistically significant (Robinson et al., 1982). The size of the inoculum was also critically important (Roberts et al., 1976; Robinson et al., 1982).

These results led us to explore how much of the microbial growth response could be attributed to temperature, a measure of the available water, and pH. To our surprise, the rate of growth of the common bacterial pathogens in foods reported in the scientific literature corresponded well with the rate of growth "predicted" from models developed under laboratory conditions at a range of pH values, NaCl concentrations and temperatures and combinations thereof (McClure et al., 1993; Sutherland et al., 1994; Baranyi & Roberts, 1994, 1995; Baranyi et al., 1995). Experimental methods have subsequently been developed to model divisions of individual cells (Kutalik et al., 2005; Metris et al., 2005).

The (UK) Ministry of Agriculture, Fisheries and Food initially funded a four-year program of research in modelling in 1988, after which further funding was received from the European Union (COST 905 1989–93, COST 914 1994–99) for collaboration. The USDA initiated a parallel program of research to model the growth of bacterial pathogens. Each program resulted in software intended for use by the food industry. Initial attempts to combine the expertise and software were not successful. Currently those software have been combined under the ComBase Consortium as a database of microbial responses to food environments supported by the (UK) Food Standards Agency, the (UK) Institute of Food Research, the (US) Department of Agriculture, Agricultural Research Service, the European Union (for 2 years to facilitate populating the database from European Supporting Members), and the Australian Food Safety Centre of Excellence (www.combase.cc). ComBase Predictor can be downloaded and accessed to "predict" the rate and extent of growth of a range of bacterial pathogens at a range of constant, or changing, temperatures. There are opportunities for food microbiologists worldwide to participate in the further development of ComBase by adding dynamic measures of growth and death to the database, or to investigate areas still requiring effort e.g. the influence of fluctuating temperatures on the extent of lag time, comparing "predicted" growth with growth in a wider range of food formulations. ComBase and the associated models have proved popular as a teaching aid, and in making risk assessments.

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Our Experiences
by the IAFP 2007 Student Travel Scholarship Award Recipients

Rebecca Goulter
University of Queensland
Brisbane, Australia

First and foremost I would like to thank the International Association for Food Protection for honoring me as a recipient of the student travel scholarship to attend the 94th Annual Meeting in Orlando this year. I believe it will be a moment and achievement in my career that I will always remember.

As an undergraduate student, attending an international conference such as the IAFP Annual Meeting presented me with a unique learning experience that few undergraduate students have the opportunity to undertake. Foodborne disease, future detection of foodborne pathogens, microbial biofilms and biofilm control are areas in which I am personally interested, and being able to attend presentations given by the world's leading professionals in these areas was an enjoyable learning experience.

I met many people who I intend to keep in close contact with, on both a social and professional basis. The students I met during my trip, and the consequent friends I made, are truly invaluable contacts. My fellow students will be my fellow colleagues in years to come, and I am grateful for being able to meet such intelligent students from universities all over the world. I also met some fantastic laboratory managers and researchers whose knowledge was an inspiration to me, and getting to know them in a variety of environments was a great experience.

I have learned that the international community of food safety and quality is a very large, diverse, and knowledgeable group of people. I am truly grateful for being given the opportunity to learn from this community and become a part of it, and hope to one day contribute more knowledge and diversity to the industry.

Hyun-Ho Jin
Chung-Ang University
Seoul, Republic of Korea

IAFP 2007 provided me with a wonderful experience. In the first place, it was the first time for me to leave home and travel abroad, and have conversations with many people who looked very different from me and spoke in English, a language that I am not familiar with. I was impressed by their kindness and polite behavior of listening to me with a smile, even though my poor English may have annoyed them. It felt unfortunate that I returned to Korea just when we began to have a good communication with one another.

It was amazing that I could participate in the international academic seminar abroad. Furthermore, it was an invaluable experience to directly observe the latest technology in food safety and quality, be directly informed about it, and ask questions directly to the experts. In addition, when various experts encouraged me and asked difficult questions at the same time, I realized that I have a long way to go. That feeling goes beyond description. However, it helped me look at myself and set a clear goal of study and research from now on.

It seems to me that I think in a more mature way than before, and I am thankful to the members of IAFP who allowed me to experience these things. Moreover, I hope that other students also received this valuable experience from IAFP.

Ivan Nastasijevic
University of Novi Sad
Beograd, Serbia

Attending IAFP 2007 in Florida was, no doubt, an extraordinary event for me — as I suppose it was for all other food safety scientists/professionals, exhibitors and participants. This is a result of the very well-tailored, scientific, and professional program and timetable, which included subject-specific symposia and roundtables on hot topics, technicals, posters, interactive sessions, committee meetings, professional development group activities, interesting presentations and events in the exhibit hall—as well as the well-planned afternoon social gatherings (cocktails, luncheons, dinners, etc.) and great opportunities for professional networking.

On this occasion, I'd like to sincerely thank the Selection Committee colleagues who elected me for an IAFP 2007 Student Travel Scholarship. This enabled me to experience the high-ranked food safety forum of IAFP, and to realize the nature of this association, which is primarily focused to provide sincere professional support to developing food safety scientists/professionals worldwide.

The scientific program was carefully chosen to cover all relevant up-to-date food safety issues and to discuss enhancement and improvement of the global food safety supply. Speakers were dedicated to explaining and clarifying all aspects of their presentations, and the time limits were kept under control.

Presenting a poster session allowed me to experience the very professional attitude and frank interest shown by attendees seeking to hear more about research performed by other colleagues and to discuss it knowledgeably.

The meetings of the professional development groups (PDGs), uniting food safety scientists with similar professional interests to generate new ideas and approaches, are also a very important activity of the IAFP meeting. I participated actively in the Student PDG meeting, and consider this a good experience. I look forward to seeing the outcome of our ideas and the development of proposals we generated for IAFP 2008 in Columbus, Ohio.

Finally, I hope that this was just my first step in the global food safety forum of IAFP, and that my networking with fellow colleagues will contribute to mutual cooperation opportunities in the future. I will keep in my memories the hospitality, dedication, good spirit and energy of the IAFP staff and the very positive attitude of all other participants. So, let IAFP 2008 be even more successful!

Haley F. Oliver
Cornell University
Ithaca, New York

My first IAFP Annual Meeting was an unparalleled opportunity to be updated on the direction of food safety and to network with individuals from industry, government, and academia. It was exciting to see the exchange of results, ideas, and multifaceted approaches to unique food safety issues from around the globe.

I was amazed by the enthusiasm of the Student Professional Development Group; they offered a number of activities and resources to students attending the meeting. Their dedication to enhancing student involvement with IAFP truly demonstrated that they are achieving the goals of the Student PDG while simultaneously helping students achieve personal goals. I was also impressed by the diversity of services and products offered and demonstrated by exhibitors; they offered cutting-edge techniques and a wealth of resources that have direct application to ensure a safe food supply now and in the future.

I greatly appreciate having had the opportunity to attend the IAFP 94th Annual Meeting, and thank the IAFP Foundation for supporting my trip. I encourage students to attend IAFP 2008 in Columbus, Ohio, and to apply for the Student Travel Scholarship, so that they may have an equally rewarding experience.

Rebecca C. Robbins
North Carolina State University
Raleigh, North Carolina

As a recipient of the 2007 Student Travel Scholarship, I would like to thank the Association and the Foundation for supporting my attendance at the 94th Annual Meeting. The kindness and generosity extended to me by the staff, executive board, and membership was unforgettable. The atmosphere of the luncheons and nightly receptions made it easy to meet new colleagues, chat with friends, and build a network of scientific and industrial professionals to call on in the future.

The scientific program addressed many pertinent issues relevant to scientists and industrial partners involved in food safety and technology. Of particular interest to me were the programs addressing issues in detection of foodborne pathogens, pre-harvest food safety, and application of molecular technologies in food safety. The diversity of topics showcased by the symposia, technical sessions, and roundtable discussions that took place during the meeting was tremendous. I also enjoyed the Ivan Parkin lecture from Mr. Carl Custer, and was excited to see that dedicated scientists can and do advance food safety. I am proud to be part of this organization, which has such high regard for science, its process, and ultimately, its application in protecting the global food supply.

It was a thrilling opportunity to hear extramural discussions and the musings of so many prominent academicians, regulatory officials, and industry specialists who have contributed to national and international food science and protection programs in such areas as public health, economics, and security. In addition, it was an honor to participate in the scientific program myself and to participate in the Developing Scientist Competition.

As a new IAFP student member, I am privileged and thankful to have been invited to attend such an intellectually stimulating, scientifically thorough, and socially engaging meeting of food scientists.

After 51 Years, 3-A Symbol Council Disbanded

3-A Symbol Council (left to right) Front row: Robert Sanders, David Fry and Randall Chloupek; Back Row: Warren Clark, William LaGrange, Larry Hanson and Robert Elliott.

A historic meeting took place at IAFP 2007 in Lake Buena Vista, Florida. On July 10, the remaining Trustees of the 3-A Sanitary Standards Symbol Council met for one final time to officially vote itself out of business. The Symbol Council was formed back in 1956 by the International Association of Milk and Food Sanitarians (now IAFP) in cooperation with the Dairy Industry Council (DIC) and the Dairy and Food Industry Supply Association (now Food Processing Suppliers Association or FPSA). Over the years, a number of very dedicated IAFP Members served on this Council and devoted their time and efforts to maintaining the high values set by the 3-A Sanitary Standards. These Standards are written for dairy processing equipment, but are used in a number of other food-related industries as THE standard for processing equipment.

Since 1999, a number of changes have taken place in the 3-A Sanitary Standards arena. One of these changes was to establish an entity to manage and operate all aspects of the 3-A Standards process. That entity formed in 2003 is named 3-A Sanitary Standards, Inc. (3-A SSI). 3-A SSI now oversees the issuance of the 3-A Symbol for use on approved equipment. As this was the responsibility of the Symbol Council in the past, the Council remained in operation during a transition period, but has now relinquished their control of the Symbol to 3-A SSI.

IAFP wants to thank all Symbol Council Trustees for their dedicated service over the past 51 years. We offer the pictures on this page as a tribute to the most recent Symbol Council Trustees.

For information on 3-A Standards or symbol authorizations go to www.3-A.org

Session Summaries

Members of the IAFP Student Professional Development Group assisted the Convenors by serving as Session Monitors at IAFP 2007. Student Monitors prepared the following session summaries for presentation in *Food Protection Trends.*

S1 – Foodborne Disease Update

Elizabeth Hillyer, University of Guelph and Laura Bauermeister, Auburn University

The symposium outlined outbreak information as well as the subsequent investigations of outbreaks of *Escherichia coli* O157:H7 in spinach, botulism associated with carrot juice, and *E. coli* in lettuce. The presenters were Thai-An Nguyen, Benson Yee, Anandi Sheth, Donald Zink, Martha Iwamoto and Maha Hajmeer. A national outbreak of *E. coli* O157:H7 in bagged spinach in the United States involved 204 cases, spanning 26 states and resulting in 3 deaths. During the investigation, environmental samples were collected from water, soil, cow and wild pig feces, field products and the processor environment. *E. coli* O157:H7 was found on all four ranches, and there was a direct match from one ranch to the outbreak strain. The California Food Emergency Response team (CalFERT) was implemented in 2005 to address the recurring problems in environmental investigations. Although the CalFERT initiatives have improved lab methods, and although they use the latest technology such as GPS, digital photos, and standardized forms, the exact route of the contamination is still unknown. In September 2006, 3 initial cases of botulism were identified, which were not related to home-canned foods. The toxin type A was identified and found in carrot juice. *Clostridium botulinum* may be naturally present in carrots and juice, and the only barrier is to maintain a low temperature. When *C. botulinum* is present in juice it has no odor and does not produce gas. There were a total of 4 cases, and all but one was linked to the consumption of carrot juice. In the last case, the cause could be confirmed or denied because the product and container had already been discarded. The cause of the outbreak was likely temperature abuse by the consumer, as there was no common distribution channel, route, carrier or retailer. Finally, two multi-state outbreaks of *E. coli* in lettuce at Taco Bell and Taco Johns restaurants in November and December 2006 were presented. Outbreaks of *E. coli* associated with leafy greens continue to be common, and possibly even more common than those associated with ground beef. Taco Bell initially cited green onions as the source of illness, but the actual source of these outbreaks was lettuce. In the Taco Bell outbreak, the lettuce was traced back to a single producer and then a single field, but how the *E. coli* contacted the lettuce is still unknown. In the Taco Johns outbreaks, the lettuce shipments came from a single processor, with two different suppliers. The implicated lettuce came from the California Central Valley, but again, no mode of contamination of the lettuce was identified. The CalFERT approach maximized efficiency, speed and traceability, as well as the sampling and lab methods used in the investigation. The continued efforts of CalFERT serve as a good model for outbreak investigations, and, with continued development, will increase the efficiency of investigation of future outbreaks.

S2 – Vaccination Strategies to Control Foodborne Pathogens from Farm-to-Table

Sara Gragg and Melissa Hughes, Texas Tech University

Dr. Karen Kotloff, with the University of Maryland School of Medicine, Center for Vaccine Development, began the session discussing the paradigm of vaccine development. Positive public perception, substantial disease burden and scientific feasibility are the three components that must be considered when developing a vaccine. She discussed the importance of cost, time and resources required, as well as the importance of determining the type of vaccine. Annual burden of foodborne disease is the driving force when instigating research for a new vaccine. New research and technologies have greatly improved the area of vaccine design and development in recent years.

Dr. Rodney Moxley, with the University of Nebraska-Lincoln, Department of Veterinary and Biomedical Sciences, discussed cattle are a major reservoir for *Escherichia coli* O157:H7. His research focused on control of this pathogen by utilizing a Type III secreted protein vaccine injected subcutaneously. Through his research, it was discovered that a three-dose regimen produces the most reduction. Seasonal variation is observed in cattle, with higher levels of *E. coli* O157:H7 present in the summer than in the winter, and he spoke

of how the vaccine should reduce pathogen levels down to winter-time levels during summer months. In order for a vaccine to be effective, it must target mechanisms of colonization within the animal.

Dr. John Maurer, with the University of Georgia, Population Health, began his presentation by pointing out that reducing *Salmonella* spp. begins with rodent control and overall cleanliness on the farm. However, only so much can be done in the processing environment to control this pathogen, and unfortunately birds respond poorly to vaccines because of their specific immunity. To increase vaccine efficacy, naïve broiler chickens were used in his study. The data obtained thus far show no statistically significant differences between vaccinated and non-vaccinated flocks, and he pointed out that one year may not be sufficient to determine the effectiveness of a vaccination program. He suggested that vaccines in combination with competitive exclusion and biosecurity may prove to be more effective in reducing *Salmonella*.

Dr. Ryan Novak, with the CDC, Department of Viral Hepatitis, presented information on the use of the hepatitis A vaccine to prevent further outbreaks in food. He stressed that controlling hepatitis A should begin in the workplace and should include good hygiene and proper food handling. Vaccination is highly encouraged, but is very costly because of the high turnover rate of employees in foodservice. He concluded his presentation by identifying molecular epidemiology and the improvement of outbreak detection as two means of decreasing the burden of hepatitis A.

Dr. Robert Atmar, with the Baylor College of Medicine, Department of Molecular Virology and Microbiology, identified Norovirus as the most common cause of water and foodborne disease. There is a vaccine available, but many challenges still remain. Because the virus affects only humans, animal models are not available for testing the vaccine. He also discussed how all people are susceptible to some Norovirus, and the type is gene-specific.

S3 – Food Defense Research and Application

Emily Mathusa and Courtney Rheinhart, Virginia Tech

Faye Feldstein from the FDA/CFSAN explained FERN, the nationwide network that integrates federal, state, and local laboratories. This communication between labs allows issues to be addressed quickly. Ms. Feldstein also described the ALERT initiative, which stands for Assure, Look, Employees, Report, Threat. This initiative raises awareness of food defense. Beginning next year, there will be social science research to determine how effective the ALERT system is.

Shaun Kennedy, the director of the National Center for Food Protection and Defense, first defined food security, safety, and defense. Mr. Kennedy discussed how economic tools allow the industry to invest in defense, as well as how agent behavior plays a role in food defense. To dispose of contaminated food safely, there must be a thorough understanding of food and agent interactions. This allows potential hazardous agents to be detected rapidly.

Robert Phillips of the USDA discussed the detection of biological threat agents in food matrices. He first discussed the challenges in detecting *B. anthracis* in food matrices. To detect this bacterium, a heating step is required first for enrichment. There are also challenges with detecting *Y. pestis* and *F. tularensis*. For example, the only reliable enrichment is an animal model. Finally, the detection of *C. botulinum* toxins was addressed. Although the mouse bioassay is the gold standard for the detection of this toxin, not everyone wants to use this method. Therefore electrochemiluminescence is being explored as an alternate method of detection.

Mark Tamplin from the University of Tasmania discussed pathogen risk modeling. He reviewed common defense pathogens, including *B. anthracis, Y. pestis, Salmonella* Typhimurium, and *C. botulinum*, and their related foods. He then compared the growth and death parameters of the different pathogens. An important point made was that these pathogens are less robust than common foodborne pathogens such as *E. coli* and numerous species of *Salmonella*.

Isabel Walls from the USDA discussed using research findings to develop food defense initiatives and to update guidance documents. She talked about protecting our food supply by using smart communication between different parties without sharing important information with terrorists. Protection should be a shared responsibility between industry and government, and only science-based strategies should be used. She outlined and discussed the important factors of a food defense initiative, including preparedness, response, and recovery.

The final speaker, Skip Seward from the American Meat Institute, spoke about food defense countermeasures for meat and poultry establishments. He opened by talking about the catalysts for countermeasures. A point that was stressed was that high accessibility leads to vulnerability. Measures discussed that may reduce accessibility included equipment and packaging design, facility and process design, and regulation of employees and visitors. Other countermeasures discussed included water treatment, thermal processing, and sanitation plans.

S4 – Outreach Programs to Promote Dairy Products and Their Safety Around the World

Pratik Banerjee, Purdue University and Ravi Jadeja, Louisiana State University

The focus of the session was to highlight the assistance and the outreach programs to

promote safer dairy food products across the globe, with special emphasis on developing nations. Dianne Lewis initiated the talk by highlighting the role played by her organization in reduction of technological barriers to promote US dairy products in different nations. To elaborate her claim she cited several examples, such as pesticide and veterinary drugs-related regulations in Japan, test methods employed in China, certifications related to health hazards in India, and vitamin fortification-related regulations in Mexico, to name a few. She described how the organization has resolved some of these problems by initiating talks and scientific discussions among authorities from different countries to promote US dairy products abroad.

The next speaker, Gabriel E. Pascual, described the collaborative efforts to promote a Pasteurized Milk Ordinance (PMO) in Latin America, with a special focus on Colombia. He described how some of the Colombian farms adopted PMO to control dairy production. He also mentioned a comprehensive program to enhance dairy product quality by implementing training, certification, container safety considerations, labeling requirements, introduction of "Grade" concept, and introduction of Standard of Identity in the context of PMO implementation, which has played a significant role in enhancing the safety and quality of Colombian dairy products.

Lochrane Gary of the University of Florida gave an account of his on-field experience of working in Afghanistan to promote hygienic and safe dairying practices. He presented a pictorial depiction of his work among the Afghan communities of two provinces. He focused mainly on education of women (who are usually responsible for household dairying), hygienic practices, water management, etc. The Afghan dairy sector does not have a well-organized structure; therefore, it was important to establish a link between animal care providers and the farmers. He described how he developed a program to educate veterinarians to work with dairy animals to provide animal healthcare. Various aspects of animal production and management were also implemented.

Guiseppe Licitra talked about the iPOW project, which aims to enhance cheese safety in African nations through information technology. This project educates and encourages the women to produce safe local cheese products. The speaker mentioned different kinds of traditional cheeses produced in Africa and other parts of world e.g., Kefir and Kumiss from Africa, karish from Egypt and Panner from India. The project workers trained groups of women in traditional cheese making with food safety in mind. According to the speaker, iPOW aims to teach and improve traditional cheese making, thereby enhancing food safety.

Alok Jha talked about promoting the quality and safety of traditional dairy foods produced in India. He gave a brief introduction to the Indian dairy industry and to important distinctive aspects of the traditional sensory profile. According to the speaker, the strength of the Indian dairy industry is higher production volume, but fully 50% of the total product goes to unorganized milk processors. On the other hand, a weaknesses is the lack of scientific documentation of sensory, physicochemical and microbiological profiling. He also mentioned distinctive aspects of traditional processing such as boiling, heat denaturated intermediate moisture products, etc. The speaker also gave the sensory profile of different products, along with safety aspects, including the safety of packaging.

S5 – Measuring and Motivating Safe Food-handling Practices at Home, at Retail and in Food Service

Silvia Dominguez, Rutgers University
and Sacha Derevianko, University of Delaware

Sheryl C. Cates, from RTI International, talked about what surveys say about food handling in the home and at retail. These surveys show large gaps between knowledge and practice. A meta-analysis of published studies looked at the demographics of consumers most likely to consume risky foods. This information may be useful for development of targeted food safety education programs. Surveys on food safety practices of food workers identified barriers to safe food preparation: high volume of business, equipment design and lack of food safety education and training. Chris Griffith, of the University of Wales Institute-Cardiff, gave an informative look into what consumers really do with their food. Most foodborne disease outbreaks publicized in the media today stem from large food operations. However, Griffiths says, the majority of food outbreaks actually occur in the home. Why? Domestic kitchens have simply not been studied adequately. Also, studies have shown that although consumers are aware of proper food handling techniques, they do not always put them into practice. Consumers today are still making food handling errors, and their behavior should continue to be examined. Lydia Medeiros, from Ohio State University, discussed the strategies, interventions and tools for teaching at-risk populations. At-risk groups are particularly susceptible to pathogens in food, and food safety education targeted specifically towards them will be more effective. In the US, these groups constitute 20% of the total population. Communication, customization, credibility and flexibility were mentioned as the components for delivering an effective food safety message. Ben Chapman of University of Guelph gave a humorous and yet very poignant presentation entitled "Tools

to Enhance Compliance with Best Food Safety Practices." Chapman argues that today's messages to the public about food safety are "sanitized" and not completely effective. He suggests that messages should be more audience-targeted, culturally relevant, and compelling. These are methods he has actually been putting into practice by creating eye-catching info sheets and a website known as "barf blog", which can be seen at barfblog.foodsafety.ksu.edu. Frank Yiannas presented the food safety approach at Walt Disney World, "Food SafeD begins with me." Traditional food safety strategies include training, inspection and micro testing, but food safety culture constitutes an innovative approach to food safety. Food safety culture is created by leaders; it combines food science and behavioral sciences to manage food safety. Five strategic concepts to create a strong food safety culture were listed: create performance expectations, educate and train employees, develop a food safety common plan, set performance goals that can be measured, and establish consequences for food safety performance and behaviors. This is a continuous improvement model. Toby A. Ten Eyck, of Michigan State University, spoke about his experience in "Evaluation of Food Safety Risk Communication Efficacy." He examined the roles of credibility, trust, and legitimacy in developing effective food safety messages. The more voices or perspectives portrayed in these messages, the more plausible and relatable they become for the audience, thus causing the audience to be more likely to take these important cautions into consideration.

S6 – Long-term Sequelae of Pathogens Transmitted by Food

Emily Mathusa, Virginia Tech
and Karla M. Mendoza, Rutgers University

This session was opened by Marguerite Neill with "The gift that keeps on giving: Postinfectious Sequelae of Foodborne Pathogens." She first gave a background on immunology and disease and defined important terms for understanding the topics to follow. She wrapped up by discussing the implications of current consumer trends for foodborne illness.

The next speaker, Ban Mishu Allos from the Vanderbilt School of Medicine, gave a talk entitled, "Guillain-Barre Syndrome Associated with *Campylobacter jejuni* Infection." He began by describing the epidemiology and clinical aspects of both GBS and *C. jejuni* infection. The evidence for links between this *C. jejuni* infection and the development of GBS were presented, including case reports, serological studies, and stool culture studies. One third of all cases of GBS have been correlated with *C. jejuni* infection, and these cases of GBS have been more severe than other cases.

John M. Townes from Oregon Health and Science University presented "Incidence and Clinical Spectrum of Reactive Arthritis Following Foodborne Illness." He began by describing symptoms of reactive arthritis (ReA). ReA follows infection that includes dysentery, which can be caused by several foodborne pathogens, including *Campylobacter*, *Salmonella*, *Yersinia*, and *Shigella* spp. The evidence linking foodborne illness with ReA comes from case reports and outbreak investigations; a Foodnet study has linked foodborne illness with ReA. This study found that *Salmonella* spp. are the most likely pathogens for initial illness leading to ReA and that the serotype did not seem to make a difference. He noted that there were limitations to this study and more population studies are needed.

John R. Brandt, of the University of Mexico, presented "Late Sequelae and Long-term Outcomes in Children with Shigatoxin-associated Hemolytic Syndrome." Hemolytic Uremic Syndrome (HUS) is associated with thrombocytopenia, anemia and acute renal insufficiency. More than 90% of HUS cases are diarrhea-associated, and 50–80% is Shigatoxin-associated. Infection with *E. coli* O157:H7 leads to thrombotic microangiopathy (TMA), a pathological lesion of HUS, in which diffuse intravascular thrombosis occurs without the coagulation cascade activation. Dr. Brandt focused on children because they are most susceptible to *E. coli* infections. The key treatment of HUS remains prevention of shigatoxin-associated infection by vaccines, shigatoxin-binders or antibodies. There is no effective treatment for TMA, which always requires supportive care. To treat sequealea we can control blood pressure and prevent angiotenism.

Tanya Roberts presented "The Economic Costs of Long-term Sequelae of Selected Foodborne Pathogens." The cost of some foodborne pathogens linked to chronic diseases, such as *Campylobacter* (paralysis), *E. coli* O157:H7 (kidney failure), *Salmonella* (arthritis), *Listeria* (neurologic effects), and others were discussed. According to ERS, hospitilizations and medical costs due to foodborne illnesses amount to $6.9 billion annually. For example, a severe acute infection or death due to *Campylobacter* can cost $1.2–6.7 billion for one individual, but the exact value varies according to the circumstances. Death and sequelae remain the most important cost, components. For more information on the economic costs, ERS has a Web site www.ers.usda.gov/data/foodborneillness/.

S7 – The DaVinci Code of Auditing: Reaching the Holy Grail of One Global Standard

Diana Carolina Naar, University of Tennessee

The food industry is continuously undergoing an array of food safety-redundant audits from direct customers, brokers, retailers and food service clients. Audits are a systematic, independent and documented process for obtaining records, statements of fact or other relevant evidence that

can be objectively evaluated to determine the extent to which a set of policies, procedures or requirements are being followed. Duane Burau defined audit objectives: to assess the level of management commitment to quality, to develop a level of trust and technical competence, to measure quality improvements, to provide communication links as supplier/customer make changes, to identify strengths and weaknesses of suppliers, to provide documents for future reference and, at the bottom line, to help in the purchase decision-making process. There are different types of audits (plant audits, product audits, function audits, HACCP audits, and regulatory compliance audits) that are performed by different groups: companies, customers, third parties and regulatory agencies. Bruce Becker addressed the fact that the acceptance of GMA-SAFE audits as a single standard for food safety audits is necessary before implementing a scheme to benchmark food safety standards worldwide. Having one simple harmonized global food safety audit standard may not be unreachable, but we need to work together on tearing down barriers for harmonization, building bridges among the continents by recognizing cultural and operational differences. Cindy Jiang emphasized that a single client may even request more than one type of audit at the same facility. A proliferation of audit standards is time-consuming and represents a significant financial cost that, if reduced, could allow allocation of financial resources for the improvement of Food Safety Programs. There is a need, not to work together to approach a common framework of Quality Management System and develop one global food safety audit standard for food processing facilities. Tom Chestnut talked about harmonizing GAPs and Audits at the farm level. The goal is to define general and commodity-specific national requirements that can result in a gold standard. There is a need not to write a new standard but to compile a set of key elements that are considered in the different standards. Paul Ryan talked about the SQF perspective, mentioning that the food industry can work together to harmonize the audit report formats, the auditor requirements and the company requirements, and the food sector can follow the automobile industry example by establishing a Food Sector Accreditation program. The last speaker, Dr. Louise Fielding, stated that in England, The British Retail Consortium Global Food Standard for companies supplying retailer branded food products is setting principles to minimize duplication of evaluation, ensure the effective control and maintenance of the standards, ensure openness, transparency and compliance with fair trading legislation, promote direct stakeholder participation as part of a technical advisory committee and confirm the follow up of corrective actions on non-conformity.

S8 – Recent Pivotal Decisions of the National Conference on Interstate Milk Shipments

Marjorie Fullerton and Shara Johnson, Alabama A&M University

Steven Sims, of the FDA, began the presentation with the topic "The Safest Possible Milk Supply for all People." He discussed the different issues associated with the dairy industry, which is governed by the National Conference on Interstate Milk Shipments (NCIMS). He also spoke about the safety of the milk supply, evaluation of pilot plants, and the different levels of regulatory inspections. His presentation included the decision making process of the NCIMS.

Dennis Gaalswyk, of Quality Chekd Dairies Inc., presented "NCIMS-International Certification Pilot Program (ICPP)." He outlined the details of the pilot programming, which are stated in Proposal 316. During his talk he also explained the basic requirements and guidelines for the pilot program. He commented on the current activities of third-party companies and preparations for the first regulatory inspections.

Allen Sayler, of the International Dairy Foods Association, concluded the first half of the session with the topic "NCIMS Proposal 303-Pilot Program for all Aseptic Plants Producing Grade A Products." He spoke about the controversy dealing with the regulation of grade A milk over the past four years. Solutions to this problem, which were presented at the NCIMS conference in May 2007, were further discussed during his presentation.

Kathy Gombas, of Dean Foods, began the second half of the session with the topic "Dairy HACCP Innovations." She reviewed the Dairy HACCP Innovations, which included hazard/control guides, technical question and answer sessions, and training forums. These innovations will be used with the NCIMS HACCP Plan, which involves seven states and six pilot plants and which may be implemented, evaluated, and enforced under the NCIMS as an alternative to the traditional inspection/check rating.

Craig Nelson, of Vigilistics, Inc., presented "Paperless Reporting, Critical Pasteurization and other Critical Processes." He discussed the transition from traditional reporting to paperless reporting by use of the computer. He explained the twelve-point criteria for computer reporting and the check list for paperless reporting. Safeguard monitoring, raw milk storage, and equipment cleaning was also evaluated. There must be a back up power supply and the system must be maintained if the paperless reporting is to be effective.

Steven Sims, of the FDA, completed the evening session with the topic "Other May 2007 Critical Decisions." He spoke about the decisions that were made at the last NCIMS conference. There

were 105 proposals deliberated upon and, 56 of which passed. The following were mentioned in select proposals: reclaimed water from condenser and heat exchangers, criteria for open evaporation cooling towers, and CIP cleaning. The objectives of the symposium were met and the recent pivotal decisions of the NCIMS on Interstate Milk shipment were adequately discussed. Each speaker honored the guidelines given and gave sufficient as well as current information.

S9 – What's the Future of Foodborne Pathogen Detection?

Rocío Morales-Rayas and Azadeh Namvar, University of Guelph

Time and speed in pathogen detection in food remain a serious concern for the food industry. Therefore, the need for direct detection motivates researchers to seek alternative detection methods. Dr. Lee-Ann Jaykus started the session by giving an overview of the conventional and rapid methods that have been developed. The first generation of rapid methods, such as nucleic acid hybridization and immunoassays decreased the detection time but still require enrichment and culture confirmation. Molecular methods, which comprise the second generation, present the same advantages, but enrichment and lack of discrimination between viable and dead cells remain as problems. DNA hybridization real-time PCR and microarrays provide a decrease in detection time, and reduction or elimination of sample enrichment. However, these methods are not quantitative either. Therefore, to improve these detection methods, a pre-analytical sample processing and assurance of detecting viable cells are needed. Target separation from the food matrix and inhibitors in the sample are the main obstacles. In this sense, biosensors are promising in speeding the tests and removing some of the obstacles. Some of the advantages presented by biosensors are their specificity, high degree of sensitivity and user-friendly characteristics. Conclusively, the second generation of rapid methods are able to increase the speed and sensitivity, as well as to detect multiple targets. Nevertheless, improvement for better performance of all of them is still required. Collaboration between researchers remains as an issue in achieving ideal performance. Dr. Nigel Cook talked about real-time PCR and near real-time detection. After referring to 120 papers that have been published about real-time PCR, he emphasized the small number of applied assays in the routine lab. International validations as well as training were also highlighted for implementation of real-time PCR protocols in a diagnostic lab. Dr. Sabah Bidawid introduced a new microarray chip that is able to detect most of the genotypes of Norovirus. The use of cationically charged beads for detection of hepatitis A virus and Norovirus was also described during this talk.

The second part of the session was opened with "Biosensors, Basic definition," presented by Dr. Omar A. Oyarzabal. Different types of transducers used in fabrication of biosensors (optical, fluorescent) as well as their applications were mentioned. Advantages of biosensors such as speed (fast real-time detection), elimination of sample preparation and mass production with stability were discussed. Standardization and set up, ruggedness and validation of the protocol, along with cost, were pointed out as disadvantages that remain. Professor Shu-I Tu described different applications of biosensors for the detection of multiple targets. One of the benefits of this approach is the high level of sensitivity, in addition to time savings and costs. However, specific antibodies and production of immunoreagents remain as drawbacks. A combination of nucleic acid and protein microarray was proposed for unlimited target detection. The last speaker of the session, Jong Wook Hong, presented a novel microfluidic chip for single bacterial cell detection. A description of nano-microfuidic devices for biological systems and nanobiotechnology for detection of foodborne pathogens was given.

S10 – Impact of Emerging Food Trends on Food Safety

Julie McKinney, Virginia Tech and Angela Laury, Texas Tech University

Christine Bruhn, from the University of California-Davis, opened with the topic "Emerging Consumer Trends and Challenges." The increase in the population of young and elderly, lifestyle changes leading toward preferences for convenience and refrigerated foods, increased popularity in natural/minimally processed foods, and changes in dietary patterns have a great impact on food manufacturers. Some challenges that need to be addressed include: recognizing new hazards, modeling correct food handling practices, connecting eating and illness principles, and questioning some food safety messages presented by the media.

Fabrizo Arigoni, representing Nestlé, followed with "Probiotics, the different challenges from an industrial perspective." Mr. Arigoni highlighted the importance of probiotics for the body's digestive tract, specifically their ability to provide protection against infectious diseases as well as their ability to aid in nutrient delivery. The key steps that Nestlé uses for development of probiotics are: research, development, biomass, and product application. They also have five main phases that ensure a safe and beneficial product.

Joseph Meyer, representing Kraft Foods-Oscar Mayer, discussed the topic "Natural Ingredients and Food Trends." Although the definition of "natural" varies depending on the source, natural ingredients

can be taken from microbial, plant, and animal sources. Some manufacturing challenges include working with complex food matrices, unrealistic usage levels for benefits, negative organoleptic impact, introduction of food allergens, limited applications, and the fact that some ingredients may actually provide a lower level of microbial safety. The ideal antimicrobial natural ingredient should have a robust bacteriocidal effect, be consumer friendly, have a wide pH spectrum, and be easy to transport.

Doug Powell, of Kansas State University, tackled the issue "Organic Foods and Food Safety: Separate, Antagonistic, or Symbiotic?" According to Powell, people demand organic products because they perceive them as being safe, as well as more healthful for the consumer and environment. Unfortunately, organic is largely a marketing tool. Because "organic" has become too commercial for many people, the "eat local" (eat food grown by small farmers in your area) movement has begun to gain popularity.

Martin Cole, of the Illinois Institute of Technology and National Center for Food Safety and Technology, followed up with "Food Safety Challenges Posed by Minimal/Opinion traditional Food Processing Technologies." When innovative processing technologies are considered, the focus is on preservation of product nutrients, incorporation of natural flavors, and convenience. Traditional techniques are primarily used to destroy pathogens, but with minimally processed products, the safety is reliant on the end-user. New technologies (UV and ultra high pressure) are complicated because they may have complex kinetics that are not well understood at this point, and many rely on hurdle technology for inactivation of pathogens.

Sara Mortimore, from General Mills, discussed "Food Safety Challenges and Strategies Allowing for Unique, Year-round Globally-sourced Ingredients, Commodities, and New Products." General Mills, the world's sixth largest food company, markets its products in over one-hundred countries. Therefore, its product ingredients come from all over the world. There is no consensus among countries as to what constitutes "safe" processing practices. Because of this globalization of food production, there is a need to establish global safety programs and agreements.

S11 – Food Allergies: A Growing Food Safety Concern

Shara Johnson and Dena Roberts, Alabama A&M University

The purpose of the symposium was to give updates on recent research related to prevalence, fatality, research for a cure, consumer allergen labeling behavior and causes of reactions. Anne Munoz-Furlong, of the Food Allergy and Anaphylaxis Network, presented "Food Allergies: A Growing Food Safety Concern." She gave an overview of the history of food allergens and the fatalities associated with the study conducted. The study revealed that there was confusion about what a food allergen is; also, in restaurants there was a lack of training on how to deal with individuals suffering from food allergens.

Kevin Smith, of the FDA, spoke about "Food Allergy Regulatory Update." He discussed results from the FDA Food Allergen Labeling Study. It was stated that allergen-related recalls represent a third of all recalls. He also explained the two ways to label products containing major food allergens. In addition, the presentation gave information about the 2005 Food Code, which is the model code used by the state and local agencies to define major allergens.

Linda Gilardi, of Compass Group, completed the first half of he session with the topic "Impact of Food Allergies on the Retail Food Industry." She began by discussing the importance of the Allergen Awareness Program. This program involves adhering to a strict policy of responding to customer inquires about food ingredients and, through training, teaching employees how to assist an individual with a food allergy. Information was also given about the challenges of management and consumers when dealing with food allergies.

The second half of the session began with Dan Skrypec, of Kraft Foods, with the topic "Impact of Food Allergies in Packaged Processed Foods." He presented details about food allergies' impact on sanitation, labeling, consumer food selection, and ingredient storage. He explained that the FALCPA impact had little effect on Kraft procedures for handling food allergens. This topic continued with Tracie Sheehan, of Sara Lee Corporation. Her focus points were the impact of product development, engineering, ingredient storage, processing and packaging on food allergens.

Larry Kohl, of Walt Disney World Company, spoke about "Food Allergy Management Best Practices at Food Service." He discussed the best practices for central dining reservation, walk-in request, and incorporated food safety. The three key points given were (1) food allergies can be life threatening, (2) cross contact can happen in production areas, and (3) adequate ingredient information must be displayed on all products.

Martin Hahn of Hogan and Hartson concluded the session with the topic "Liability Issues for Food Allergens Affecting the Food Industry." He spoke about compliance with statues and regulations/ guidelines. He also discussed the most common causes of product liability cases for manufacturers and retail food service. The legal theories for product liability actions include negligence, strict liability, breach of warranty, and failure to warn. In addition, it was stated that food allergens can present a product liability risk. The objectives of this

symposium were met, and the topic "Food Allergens: A Growing Food Safety Concern" was adequately discussed.

S12 – The Wrath of *Vibrio's* "Past, Present and Future"

Marjorie Fullerton, Alabama A&M University and Stephenie Drake, North Carolina State University

This symposium focused on the recent outbreaks of *Vibrio parahaemolyticus* at the national and international level. Emphasis was placed on the factors influencing their increase and solutions for their reduction. Dr. Anita Wright, of the University of Florida, spoke on the historical and ecological perspective for *Vibrio parahaemolyticus* and *Vibrio vulnificus*. She also discussed food sources and the symptoms of the disease. Emphasis was placed on the pandemic *V. parahaemolytic* O3:K6 strain and its virulence. In addition, the virulence of *V. vulnificus* was discussed.

Liliana Rodriguez-Maynes, of the Canadian Food Inspection Agency, presented the topic "Canadian Regulatory Frame Work for Fish Products and Reduction Strategy for *Vibrio parahaemolyticus*." A review of the regulatory standards and policies with respect to the safety and nutrition of fish products was discussed in great detail. Also, the FDA HACCP guidelines were mentioned in regard to fish. The risk reduction strategy, harvesting, time, temperature control, sanitation, and storage were outlined.

Hajime Toyofuku, of the National Institute of Health Sciences, Japan, presented next. His topic was "International Perspective of *Vibrio parahaemolyticus*, Burden of Disease and Control Measures." Emphasis was placed on processing standards, storage, and issues of public health. He suggested that a risk management strategy must be based on sound science. He elaborated on codex at international level, and he ended with a discussion of developing strategies to reduce the incidences of *Vibrio* in seafood.

Angelo Depaola, of the FDA Gulf Coast Seafood Laboratory, Dolphin Island, spoke on "A Safety Strategic Plan to Open Estuaries." He discussed the different seafood sources and the causes of seafood-associated foodborne illness, emphasisizing *Vibrio parahaemolyticus*. He also talked about the shellfish policy for the United States with respect to the *V. parahaemolyticus* risk assessment. He further discussed details of storage conditions, including temperature and time. He presented a proposed plan for risk reduction of *V. parahaemolyticus*.

John Supan, of Louisiana State University, presented the topic "Where do we go from here 'Mitigating Strategies." He presented an overview of the existing situation and offered strategies for the reduction of *Vibrio*. Regulatory requirements for controlling *Vibrio* are complex and inconsistent, and they vary from state to state as well as internationally. Therefore, strategies must be put in place to ensure the health and safety of consumers against *V. parahaemolyticus*.

S13 – Pre-harvest Food Safety: Another Critical Consideration for Assuring the Safety of the Food Supply

Angela Laury, Texas Tech University and Jennifer Cascarino, University of Delaware

Lee-Ann Jaykus began the session with "Pre-harvest Food Safety: Still Evolving and Still Important." Lee-Ann highlighted how the field of microbiology, epidemiology, and food safety has evolved over the years to meet the farm to fork continuum. Challenges still remain in sampling strategies, use of molecular epidemiological data, absence of quantitative methods and detection of microbes under complex matrices. Some of her goals for industry include quantitative method improvement, more risk assessments, identification of clear outcome measures, relating pathogen load to public health impact, and increasing collaboration between experts.

William Sischo discussed "Tracking Foodborne Pathogens in the Pre-harvest Environment: *Salmonella*, Dairy Production and Produce." Dr. Sischo presented results of research performed by his laboratory related to shedding patterns of *Salmonella* in dairy cattle. He concluded that calving increased the prevalence of *Salmonella* by more than seven times and that there was no obvious diffusion of *Salmonella* between dairy farms. Water sources were found to be an influential vector for transmission of *Salmonella*.

John Maurer presented "The Impact of Pre-harvest Practices on Antimicrobial Resistance of Pathogens: *Salmonella* in Poultry." Influences of antibiotic use in the poultry industry include withdrawal time, drug approval usage regulations, public opinion, and antibiotic costs. Reservoirs of Antibiotic Resistance Network (ROAR) found that genetic exchange (conjugation and transduction) were methods for development of antibiotic resistance. They also found that most antibiotic-resistant *Salmonella* were sensitive and on the farm were susceptible to most antibiotic treatments.

Robert Mandrell presented "Understanding Microbial Contamination of Produce: What Happens on the Farm?" Topics discussed in this talk included leafy-vegetable outbreaks and *E. coli* O157:H7, the central California coast and farms, source tracking by PFGE and MLVA, and speculation on risk factors. Mandrell tried to answer the key questions associated with the Salinas Valley, CA leafy vegetable outbreaks of 1995–2006, including number of harvests per year, irrigation methods used, survival of *E. coli* O157:H7, and what happens on and around the farm.

"Understanding Prevalence and Risk Associated with Naturally-occurring Pre-harvest Pathogens: Vibrios and Molluscan Shellfish" was presented by Lee-Ann Jaykus. Strain to strain differences with respect to ecology, prevalence, and virulence occur with both *V. parahaemolyticus* and *V. vulnificus*. The aim of this study was to look at industry practices, quantitate levels of total bacteria and virulent vibrios, and investigate strain to strain differences with respect to growth and survival. It was shown that pathogenic *Vibrio* strains increased in the summer, while on-board icing of shellfish decreases levels of *V. parahaemolyticus* and *V. vulnificus* by only 1 log unit.

H. Morgan Scott discussed "Elucidating the Relationship between Pre-harvest Pathogens and Human Disease." The talk focused on defining the nature of the problem and the causes of cases versus causes of incidence, concentrating on working backward from the disease. Epidemiologic and microbiologic evidence help with the ease of elucidation of the relationship between pre-harvest pathogens and disease, but understanding the factors associated with the disease itself was difficult. Scott concluded his presentation by giving an overview of classic foodborne outbreak situations, including a semi-closed system and what occurs in different situations.

S14 – Critical Issues in the Investigation of Outbreaks of Foodborne Illness Involving Food Workers

Priti Parikh, Virginia Tech and Benjamin Chapman, University of Guelph

The CDC estimates that around 76 million cases of foodborne illness occur each year in the US; in 18–20% of these, illness is associated with an infected food worker. The purpose of this symposium was to discuss critical issues in the investigation of the outbreaks that occur because of food workers.

Ewen Todd, from Michigan State University, and Barry Michaels, from The B. Michaels Group, discussed characteristics and control of outbreaks attributed to infected workers. The main objective of studying these outbreaks is "to develop an understanding of the dynamics of transmission of infectious agents to and from the food worker in a variety of settings." Norovirus is the primary causative agent, and multi-ingredient foods such as salads, sandwiches, etc. are the primary food commodity involved in these outbreaks. Norovirus and Rhinovirus are of great concerns when personal hygiene and sick worker isolation are compromised. Therefore, personal, and specifically hand, hygiene is absolutely necessary in plant. Moreover, management is required to observe workers and encourage them to report personal, and family illness.

David Gifford, from the Washington State Dept. of Health, discussed "How Outbreaks Where Food Workers are Responsible are Investigated." In Washington, viruses are the number one cause of outbreaks. Moreover, foods that are introduced by workers are the primary cause of foodborne outbreaks. Therefore, none of the foods can be ruled out. He mentioned that *any food can be contaminated through food workers*. The four main steps to investigate outbreaks were discussed.

Agnes Tan, from Melbourne University, discussed "Outbreak Investigation: Accreditation, Microbiological Sampling and the Role of the Microbiological Laboratory." The speaker talked about outbreak investigation in Victoria only, since the investigation arrangements differ from state to state as they work closely with the health department. She mentioned that the integrity of the samples should be maintained by prevention of tampering with the samples, by proper sample storage and handling, and by documentation. Moreover, a forensic accreditation is necessary for a laboratory that provides reliable and defendable results.

Shirley Bohm (FDA) discussed the necessity of a good working relationship between agencies and a focus on what each brings to an investigation, as opposed to territorial discussions. She also mentioned that one of the barriers in an outbreak investigation is that routine responsibilities of local investigators cannot be ignored, potentially taking away from investigation resources. The investigation can be made into a teachable moment for other food handlers.

Chris Griffith, from University of Wales Institute-Cardiff, discussed a review of food investigation procedures and how the results may be used in legal situations. He used a recent television show's expose of food handling practices to illustrate a novel audit-based approach in outbreak investigation and some of the theoretical situations arising in the case.

The final presentation was a joint discussion by Ms. Bohm and Richard Sprenger of Highfield.co.uk, providing their perspectives on managing an outbreak investigation. They discussed the necessity for good communication between all players involved in an investigation, from the laboratory to enforcement to investigators. The speakers stressed the importance of standardizing interviews and developing the skills of front-line investigators.

S15 – Balancing Cultural and Religious Norms and Food Safety

Kirsten Hirneisen, University of Delaware and Julie McKinney, Virginia Tech

Joe Regenstein, Cornell University, discussed "Kosher Food Requirements and Their Origins." Kosher foods are produced under a strict set of

religious laws, overseen by a Rabbi. The purpose of the Rabbi is not to bless the food but to confirm that the food has been produced according to the rules. Kosher laws cover four general areas with regard to food: allowed animals (ruminants, traditional domestic birds, and fish), the prohibition of blood, separation of milk and meat, and the prohibition of grains at Passover. Kosher symbols have come to stand for quality, leading many people to purchase these products regardless of their religious affiliations.

Syed Rasheeduddin Ashmed, from the Muslim Consumer Group, highlighted "Halal Food Preparation/Consumption Requirements and Origins." As with Kosher products, Halal food production is based on religious requirements, specifically Muslim religious law. Swine products, meat from dead or strangled animals, blood, and all intoxicants are prohibited. Two types of Halal certification are possible: Halal meat certification without a Muslim food scientist present, and processed meat certification, which requires the presence of a Muslim food scientist.

Gihan Elgindy, from the Transcultural Education Center, addressed "Hindu Food Preparation/ Consumption Requirements and Origins." Hindus are typically vegetarian: pure (plant products only), lacto-vegetarian (milk products, plant products), ovo-vegetarian (eggs, plant products), or ovo-lacto-vegetarian (milk products, eggs, plant products). With their strong love of nature, they "eat to live, not live to eat." The most important aspect of understanding the ethnic consumer mind is providing the appropriate services that are in agreement with their beliefs and desires.

Asian foods discussed in Kimberly Livsey's section entitled "Asian Traditional Food Safety Case Study–Georgia" included Japanese sushi, Vietnamese pho, Korean barbeque and Chinese dim sum. The talk focused on cultural do and don'ts and control measures that would be important for food safety inspectors to be aware of. Major control measures and food safety problems include survival of parasites from inadequate freezing and storage temperatures. Asking many questions about ethnic food and food preparation is important to understanding potential food safety risks.

Cindy Jardine, University of Alberta, discussed "Traditional vs. Store-bought foods in Northern Canada from an Aboriginal Perspective." Traditional foods are harvested from the local environment and are typically healthier than store-bought food. The food safety issues of traditional foods include contaminants such as PCBs, pesticides (DDT and toxaphene) and metals (mercury, arsenic and uranium). An increase in the availability of store-bought foods raises other food safety issues such as outdated and contaminated foods. Botulism in canned foods and freshness of fruits and meats are the major issues of these foods for food safety.

Gihan Elindy spoke again on the subject of "Hispanic/Latino Food Preparation and Consumption, Requirements and Origins." The Hispanic/Latino population is diverse and has rapidly become the fastest growing population in America. In the Hispanic/Latino culture, foods are considered to be "hot" or "cold," which has nothing to do with the actual temperature of the food, but instead is a theory on how diet affects health and disease.

S16 – Microbial Biofilms and Biofilm Control

Karla M. Mendoza, Rutgers University
and Laura Bauermeister, Auburn University

Biofilm is a heterogeneous microorganism community characterized by cells attached and embedded in a matrix of extra-cellular polymeric substances. Dr. Ethan B. Solomon introduced the topic and explained biofilms and quorum sensing relationship. Quorum sensing is the way bacteria communicate using signaling molecules, controlling the growth by gene expression in response to population density and cell-cell signaling. Biofilms are very difficult to remove. They are resistant to certain antimicrobial agents and any moist environment can be colonized. Examples of pathogenic bacteria that can form biofilms are *Salmonella*, *Listeria* and *E. coli*. More about biofilms in food handling and processing environment was discussed by Amy C. Lee Wong. She mentioned the factors affecting biofilm formation such as the location, properties of the surface (stainless steel, rubber etc.), environmental factors (temperature, humidity), different microorganism strains and interaction among microorganisms. Biofilms have been found in meat processing plants as non-uniform layers with different areas of different size, proof of heterogeneity. She explained how *L. monocytogenes* (Lm) can survive on stainless steel surfaces without any type of nutrient and even after sanitation. In conclusion, biofilms may persist, and to control them, most important is the identification of the sources in order to implement effective sanitation practices. Dr. Bassam A. Annous followed with a discussion of biofilms on produce; specifically, he talked about *Salmonella* on cantaloupes. Foodborne pathogens on plant surfaces are not well characterized, but symbiosis has been observed among bacteria and fungi on cantaloupe surfaces. Vapor-phase sanitizers may be a novel way to control biofilm formation on cantaloupe melon surfaces. Dr. Don Schaffner discussed the removal of biofilms in food handling and the unique challenges in removing these biofilms. He showed the cleaning module of his risk model for the first time. The model demonstrates the changes according to drain location and prevalence and concentration

of Lm. However, there is a gap in the data for transfer from drain to food and variability from iteration to iteration in the number of illnesses. The draft model is under revision. Dr. Michael Doyle covered the type of biological agents used in the control of biofilms. He reported on the strains of bacteria that are ubiquitous to the processing plant environment and determined which organisms were competitive against Lm in broth. He also examined the effectiveness of bacteriophage in the prevention of biofilms. He found that competitive bacteria were able to eliminate Lm for 8 weeks after treatment in drains and that the use of bacteriophage treatment may or may not be effective, but further research is needed to determine the effects of combined treatments. Dr. Dale Grinstead talked about the traditional methods of biofilm control and the use of prerequisite programs in the control of biofilms. The importance of hygienic design was discussed, because if you cannot clean it, it will not be clean. Overall, the symposium provided a great deal of information on biofilms, methods of control and new modeling information.

S17 – Lettuce and Leafy Greens: Issues, Actions, and Opportunities

Sara Gragg and Melissa Hughes, Texas Tech University

Dr. Thai-An Nguyen, with the CDC, Epidemiology Branch, Division of Foodborne, Bacterial and Mycotic Diseases, provided an overview of the current epidemiological investigations concerning lettuce and leafy greens. Lettuce and leafy greens are the second most common vehicle for *Escherichia coli* O157 contamination. Often these products are contaminated pre-harvest on the farm, because there is no final "kill step." Produce contamination is a serious concern for the industry, and collaborative efforts from farm-to-table are required to address this issue.

Maha Hajmeer, with the California Department of Health Services, Emergency Response Unit, was involved in the investigation of the recent spinach outbreak, and identified the necessary steps for a successful investigation. She highlighted communication and coordination as key in an investigation. Step one is analysis and assessment of outbreak information. Next, field work is conducted, and documentation and samples are obtained. Finally, collection and analysis of data is performed. There are several opportunities in both pre- and post-harvest interventions to reduce the risk of food safety.

Dr. David Gombas, with the United Fresh Produce Association, discussed how the prevention of contamination is the first step in produce safety. He identified animals and wells as potential sources of contamination; however, it is difficult to resolve the issue when the exact source is unknown. He also highlighted several research needs, including a pasteurization process that retains product quality. On the other hand, research does not need to focus on new chemical disinfectants that have the same limitations. New sources of contamination must be avoided.

Dr. Chuck Gerba, with the University of Arizona, focused on irrigation and how it contributes to lettuce and leafy greens contamination. He identified storm water drains, livestock, birds, urban centers, pets and irrigation return flows as possible sources, and also mentioned how storms impact water quality. To sample irrigation water, one can test the actual water or the collected sediment. Finally, he mentioned how biofilms can also be an issue in water canals, especially concrete canals, which are often used to irrigate produce.

Ruth Petran, with Ecolab Inc., elaborated on the microbiological criteria necessary for sampling products. She recommends adhering to GMPs, monitoring food safety, shelf life and ingredient suitability. Before testing, it is crucial to determine which organism to test and what is to be done with the results obtained. She also talked about the risk involved in sampling a pathogen, including the risk of rejecting "good" food. Environmental testing is also important for monitoring pathogen harboring sites, and good controls need to be in place to generate meaningful data.

Shirley Bohm, with the FDA-CFSAN, began her presentation by listing the top commodity groups involved in outbreaks, which were lettuce, tomatoes, cantaloupes, herbs and green onions. *Escherichia coli* O157 and *Salmonella* are of particular concern because they survive well in the environment, form biofilms and can infiltrate at the site of plant damage. She emphasized certain control strategies such as pasteurization, irradiation, and prevention of cross contamination. She stressed prevention of contamination by requiring foodservice employees to report vomiting and diarrhea, as well as the importance of proper storage and handling of produce.

S18 – Preparing Scientists for the Legal Aspects of a Crisis: Step into an Interactive Mock Trial and Learn How to Become an Expert Witness

Pratik Banerjee, Purdue University and Vanija Kallur, Alabama A&M University

Toni Hofer highlighted the key components required for preparing food scientists for legal aspects. The speaker emphasized several issues such as investigation, evaluation, program implementation, HACCP and SSOP, etc. The talk also highlighted the need for training and awareness.

Donna Garren presented preparedness from a restaurant operator's perspective. She mentioned the workplace hazards and safety issues along with food safety considerations. She emphasized the need for proper documentation training and

establishment of a crisis management team to tackle any impending issues that might create legal consequences.

Melvin Kramer presented the view of an epidemiologist on legal aspects. He highlighted the need for continuing education (especially educating food handlers) and back-analysis to find out why it happened. To address some of these issues, genetic fingerprinting (PFGE or riboprinting) may yield results to show the ecological origin of the pathogen in case of a food recall. He also mentioned that there are several socio-cultural aspects which may have indirect effects on foodborne outbreaks.

David Ernest and Chris Domenic gave a detailed presentation on their research, including trial consultant focus groups. They presented the key issues that may affect jury decisions. They showed some videos depicting real-life examples of how jurors are influenced when it comes to foodborne illness-related litigation. Their research exposed that 'attitude' and 'experience' are the two major factors that determine jury decisions.

S19 – Applications of "omics" Technologies for Food Safety and Security

Karla M. Mendoza, Rutgers University
and V. V. Ramarao Kasula, Alabama A&M University

"Omics" is the study of genomics, proteomics, metabolomics etc. In an overview, Dr. Bart Weimer mentioned the disadvantages of studying this field, such as large data sets, computer needs, and high data quality, among others. In most cases, this large amount of data is not useful if not handled correctly. When using genomics, one can see exactly what genes are expressed at one time, all genes in the genome, gene expression, genome stability of individual traits and multi-gene traits. Applications to food safety are related to: good and rapid detection method, understanding survival and pathogenicity, food recalls, pathogen diversity/evolution, food defense and biosafety. Genomotyping is comparative bacterial genomics using arrays. Andrew K. Benson described genomotyping as a powerful approach to surveillance and tracking of foodborne pathogens. He also talked about having too much information and the importance of using it the right way. Genomotyping can be very difficult; one must carefully design the bacterial strain being studied so that it will yield useful information. It can be very expensive too, suggesting collaborative work as a better alternative. Avraham Rasooly followed with applications of microarrays for the analysis and detection of foodborne pathogens. Clinical microarrays are very useful in determining what pathogen caused the problem, virulence factors and antibiotic resistance; all this information is acquired simultaneously by microarray. PCR and microarray analysis are commonly used in combination, providing multiple sample testing simultaneously, and Microchip Quality Control can be used to get reliable results. After the break, Sophia Kathariou continued with the analysis of foodborne pathogens by use of "omics" technologies. Her talk was focused on the *Listeria monocytogenes* genome and how different strains are very useful for different applications. *Listeria* spp. genomes have been sequenced as well and they are helpful to understanding the species even though they are not human pathogens. The opportunities of genomics are not limited to *Listeria*; the method applies fairly well to other microorganisms, and this is what is called comparative genomics. Multiple genome sequences are essential, enrich comparisons and make them more accurate. The method addresses fundamental questions/paradigms for *Listeria*, such as evolutionary pathways between pathogenic and non-pathogenic lineages. Cognitive and experimental challenges are both crucial; interpretation and abililty to detect sources of variation need to be taken into account. Chris Minion continued talking about microarrays and the importance of using biological replicates. One must carefully design the experiments, because they are very expensive; must know what one is looking for and what to compare it to. Data analysis needs to take into account the use of *P*-values, and assistance of a statistician will help one to understand how useful the data are and how the graphs should function. A new topic, bioinformatics, was introduced by Darrle O. Bayles. Bioinformatics involves the use of applied mathematics, informatics, statistics, computer science, chemistry, and biochemistry to solve biological problems on the molecular level. Major research in the field include sequence alignment, gene finding, genome assembly, protein structure alignment, protein structure prediction, prediction of gene expression and protein-protein interactions, and the modeling of evolution.

S20 – Food Safety @ the Speed of Thought – Creating Virtual Networks

Grihalakshmi Kakani, Texas A&M University
and Julie McKinney, Virginia Tech

Frank Yiannas gave a short preliminary introduction about the importance and need for collaboration, along with the associated factors of virtual collaboration. Some of these factors include global demand and supply of food, increasing multinational companies, and higher emphasis on efficiency. However, about 50% of virtual collaborations fail; some of the factors may be lack of trust, cultural differences and time zone differences.

Frank Farro emphasized the need for and the methods of collaboration, a collective effort that is needed in modern business society. With increasing globalization of business there is a need for more information, for people specializing in several areas

and for faster decision making. Collaboration is achieved by several methods – E-mail, conference calls, and roundtable conferences. However, these methods are not very effective for global companies. Some of the constraints include not having face-to-face discussions and time lapses between the companies that restrict and delay the decision making process. Globalization necessitates new ways of working together. The diverse specialists working within companies are collaborating as expert groups, and some of the new tools employed by today's global companies include instant messaging (Yahoo messenger, ichat), forums (wordpress, blogspot, and communityserver.org), social networking (facebook, myspace.com), and web/video conferencing (webex, skype).

Robert Scuderi spoke about the importance of web conferencing. Rapid competitive changes in the business world over the past decade have caused the emergence of new methods/tools of collaboration. A timeline of change from 1800 through 2000 indicates a drastic shift in economies from a predominantly agricultural society to a sophisticated complex global economy. Today's global economies collaborate to accelerate business and it is found that even slight improvements have had big impacts in the form of increased sales/profits for the companies. Personnel in global companies work as teams in a room that is considered an electronic place where business professionals meet and share information.

Allen Fazio highlighted the need for and role of a virtual team environment. A virtual environment is comprised of three components, namely, input, throughput team and output. The team is led by a distance manager who is responsible for establishing boundaries. Some of the responsibilities of an effective distance manager include defining and describing success to the team, communicating both verbally and in writing, and demonstrating strong interpersonal skills as well as technical skills. Some of the attributes of a distance manager include being an effective leader/facilitator, being result oriented, having the ability to remove barriers, and acting as a role model for the team.

S21 – Spoilage and Its Control in Meat Products

Grihalakshmi Kakani, Texas A&M University and Laura Bauermeister, Auburn University

Robin Kalinowski began by discussing microbial spoilage in RTE meat products. Spoilage characteristics such as off-odors (sour, putrid), bloated packages (gassy), purge and discoloration are attributed to factors such as post-process contamination (during chilling, slicing, peeling, packaging), as well as the presence of typical microflora and other intrinsic factors (pH, a_w, salt, antimicrobials). Strategies for controlling spoilage include sanitation protocols designed for *Listeria* control, control of wet processes involving cooked products and equipment design that facilitates effective cleaning by reducing the areas in which microbes can grow. Some of the examples provided included spoilage in roast beef and turkey. In the case of roast beef, the product produced a foul odor due to (H_2S), and the microorganism isolated (*Clostridium laramie*) was a short, fat rod with terminal spores, which showed optimum growth at 15°C, with no growth at 20°C, and which was characterized by β-hemolysis. For cooked turkey meat (*Clostridium ctm*) the microorganism was a rod with terminal spores, non-hemolytic, with optimum growth at 30°C. Other case studies presented included slimy lunch meat caused by a lactic acid bacteria (*Leuconostoc mesenteroides*), green spotted frankfurters (caused by *Lactobacillus viridescens*), and yellow spots on cured products (caused by *Enterococcus faecium*). Control measures included effective sanitation standard operating procedures (SSOPs), environmental sampling and specific measures such as use of antimicrobials (2% lactate + 0.1% diacetate + 0.25% GDL for *Leuconostoc*, and formulation changes for turkey meat), and implementation of a *Listeria* control program by controlling salt, nitrite and heat-tolerant bacteria.

Richard Holley continued by discussing strategies to control spoilage in fresh meat products. Factors that influence shelf life include temperature, initial population, and type of bacteria present on fresh meat products. Some of the approaches for increasing the shelf life include control of atmosphere and chemical/physical treatments. The microorganisms implicated in spoilage of fresh meats generally include *Pseudomonas*, *Shewanella*, *Enterobacteriaceae*, *Brochothrix*, *Lactobacillus*, *Carnobacterium* and *Leuconostoc* Interventions to control/reduce the spoilage organisms include application of hot water, high pressure, use of organic acids/salts and ionizing irradiation. Other measures such as MAP (modified atmosphere packaging), sanitation procedures and maintaining pH of the meat at less than 6.1 are also effective.

Darren Cornforth presented information on lipid and pigment oxidation spoilage. Non-microbial spoilage of this nature is not considered a health hazard; however, quality and economic factors limit shelf life and acceptability of cooked products. Lipid oxidation is by far one of the biggest issues faced by the food industry, and antioxidant strategies to control the problem include use of BHA/BHT, curing with nitrite or related compounds, and use of plums, spices, cloves, cardamom, coriander, cumin, and ginger. For fresh meat, addition of an antioxidant is typically followed by anaerobic packaging; for cooked meat, nitrite is by far the most popular antioxidant used. The antioxidant Sodium Tripolyphosphate

(STP) is used for both cooked and fresh meats. In conclusion, antioxidant options for fresh meats can include rosemary extract coupled with MAP, those for precooked meats can include STP and raisin or plum paste, and cooked and cured meats generally contain nitrite as an antioxidant.

Jeff Kornacki wrapped up the session by presenting some case studies. Causes for spoilage are numerous and include heterofermentative *Lactobacillus* spp., yeasts and coliforms; common spoilage includes unwanted fermentations and bloated packages. Some of the examples given include unacceptable sausages (*Pseudomonas*, short shelf life), smelly smoked ham (*Lactobacillus*, cabbage odor and discoloration) and slippery franks (*Leuconostoc*, short shelf life). Approaches to control the organisms include environmental sampling, review of the HACCP plan, revalidation of process control points, and validation of effectiveness of cleaning and sanitation programs.

S22 – Mitigating Spoilage Risks in Ready-to-Drink Beverages

Julie McKinney and Priti Parikh, Virginia Tech

Ready-to-Drink (RTD) beverages, such as carbonated drinks, shelf-stable juice products, bottled water, tea, health drinks, etc., do not need any preparation by consumers. Therefore, processing of these beverages is critical. In earlier times, yeasts, molds, and lactics were associated with spoilage of RTD beverages. However, new spoilage risks have evolved with new products that enter the market containing ingredients from various sources. Now *Acetobacter*, heat-resistant molds, *Zygosaccharomyces bailii*, *Alicyclobacilli* and *Sporolactobacilli* are major concern associated with RTD beverages. The goal of this symposium was to provide an update on some of the spoilage microorganisms, their sources and detection, sanitation, and challenge studies to help mitigate the risks of microbial spoilage in RTD beverages.

Sean Leighton, of the Coca-Cola Company, discussed various sources of contamination of RTD beverages. He mentioned that beverages provide an ideal case study for the detection of environmental contamination. Production of any beverage includes the stages of raw ingredient, processing, and finished product. The finished products can become contaminated either through the raw ingredients or in the processing environment. Raw ingredients are responsible for contamination of the product with spore formers, such as *Alicyclobacillus acidoterrestris*, heat resistant molds, etc. Mold contamination commonly occurs during processing. Heat resistant mold contamination is common through sweetener, packaging material, or ingredients during hot-filling.

Tim Gutzmann, from Ecolab Inc., discussed "Sanitary Equipment Design and Sanitation in the Beverage Industry." He focused on the nature of the soil and surface to be cleaned in his discussion of cleaning chemistry. He identified four steps in the sanitation process: (i) pre-rinse, (ii) wash, (iii) rewash, and (iv) sanitization. He also discussed ten key principles of sanitary equipment design, with emphasis on *accessibility*. All areas of the equipment should be accessible to cleaning to a microbiological level.

Cathy Moir, from Food Science Australia, discussed "Challenge Studies on Ready-to-Drink Beverages." Shelf-life studies provide information only about the microbial flora present in the product at a specific point and time. Challenge studies can be completed to demonstrate product quality during product development stages and whenever formulation, processing, or packaging changes occur. Challenge studies are conducted on RTD beverages by inoculating microbes into the product and incubating for a period of time, during which the microbial flora are monitored. Certain things must be considered in challenge studies; (i) product, (ii) process, (iii) hurdle technology, (iv) sensitive ingredients and (v) target microorganisms.

Keiichi Goto, from Mitsui Norin Co. Ltd., and Hisatp Ikemoto, from Suntory Ltd., presented "An Update on Spoilage of RTD Beverages by *Alicyclobacilli* and *Sporolactobacilli*." *Alicyclobacilli* and *Sporolactobacilli* are common spoilage microorganisms that have caused problems in bottled fruit juice, tea, and isotonic drinks. These organisms cause no gas formation, no pH change, and little to no sediment when spoilage occurs. They do, however, present a chemical odor. Control is primarily dependent on prevention, keeping the organism from the raw ingredients and off equipment. *Alicyclobacilli* detection and identification were discussed in detail and for any *Alicyclobacilli* sp., YSG and BAT media were recommended.

S23 – Emerging Issues Affecting Dairy Product Quality and Safety

Stephenie Drake, North Carolina State University and Heidi Weinkauf, Iowa State University

Marianne Smukowski, Wisconsin Center for Dairy Research, began the symposium by discussing research presented in a review paper concerning the storage temperatures necessary to maintain cheese safety. Cheese properties that have been shown to increase safety include reduced moisture, low water activity, low pH, salt, competing flora and biochemical metabolites. This review concluded that a product of less than 50% moisture that contains active lactic acid cultures does not facilitate bacterial growth at 30°C (86°F) and therefore is not a safety risk. Conclusions drawn were that some cheese, such as hard cheese, may be safely displayed at room temperature; however, attempts are still being made to include in the food code a list of cheeses that could be safely displayed at room temperature.

These findings are based on cheese safety only and not on the quality of the product, as the temperatures necessary for a safe food may exceed those that are necessary to maintain desirable quality.

Kathryn Boor (Cornell University) discussed the importance of extending the shelf life of fluid milk. Each year, seventeen billion pounds of milk are lost through spoilage, accounting for approximately 18% of edible food lost. Therefore, it is essential to determine barriers to extending the shelf life of fluid milk, because improved bacterial quality also correlates with improved flavor and consumer acceptance. Research of fluid milk samples has found a great diversity of isolates in the samples, with some organisms being present in only one stage of processing, while others are found in all stages. Environmental sampling from the farm demonstrated a wide diversity of isolates, although mainly *Bacillus* spp. Currently, there is a lack of rapid detection methods to identify and quantify Gram positive bacteria responsible for fluid milk spoilage. In addition, there is a need to characterize the predominant microbes responsible for spoilage in order to further identify ways to extend shelf life and minimize spoilage and food loss.

Kristen Dixon (Chestnut Labs) evaluated the TEMPO system for use in MPN analysis with *E. coli* (EC), Coliform (CC) and *Enterobacteriaceae* against other standard methods. She discussed the basis of the TEMPO system, composed of a filler and reader station, a vial with dehydrated culture medium and a 48-well enumeration card. Multiple cards can additionally be used to expand count ranges and the CC and EC cards can be used for presence and absence studies. They found that the system compared very well with reference methods and that TEMPO allows for a significant savings in time and labor by being a hands-off system, with no counting or reading of plates.

John Larkin (FDA) concluded the symposium by reviewing past and current pasteurization requirements for dairy products. He discussed how pasteurization was first viewed as an economic issue, as a way to extend shelf life by a form of par-boiling. He then presented the current requirements for pasteurization, unchanged since 1957. Pasteurization, which encompasses the entire process, can be accomplished by any of a number of different treatments that together ultimately fulfill the definition of pasteurization. Larkin said that each system of treatments is currently being evaluated on a case-by-case basis, with feedback being given on procedures and improvements that could be made. Additionally, alternative treatments are being researched that could be used in the future, including cold filtering, ultraviolet light, high pressure processing and chemical treatments.

Special Interest Session: *Salmonella* Growth, Persistence and Survival in Low-moisture Foods and Their Environments – Strategies for Control

Sacha Derevianko, University of Delaware and Reshani N. Senevirathne, Louisiana State University

Roy Betts of the Campden and Chorleywood Food Research Association, Gloucestershire, gave an informative look into today's concerns and risks regarding *Salmonella*. A main point of interest was the protective effect of low water activity on *Salmonella* persistence in RTE foods. High lipid content in many RTE foods creates another risk factor for *Salmonella* survival. Because of its extremely low infective dose, *Salmonella* can be very difficult to detect, and food production areas need to be monitored heavily for these risk factors. Ann Marie McNamara, Silliker, Inc., South Holland, IL, spoke about "*Salmonella* the organism; its habitat and testing." She began by explaining the serotypes commonly isolated from different food types such as dry products (cocoa, black pepper, peanut butter, etc). Then she moved into design of environmental testing programs to prevent and monitor contamination. She mentioned sanitation as the main factor in contamination. Then she compared *Salmonella* monitoring versus *Listeria monocytogenes* testing on site. Finally, she pointed out the importance of validating test methods, because some products do not give correct results for some tests, such as ELISA and PCR. Paul Hall, Vice President of Global Food Safety for ConAgra Foods, presented a case study on *Salmonella* and peanut butter. Even though foods such as peanut butter may be perceived as low-risk, they can still cause major problems. Because raw peanuts are almost always contaminated with *Salmonella*, Hall emphasized, proper processing techniques are vital. These include ingredient and employee separation, employee training, environmental monitoring programs, cleaning/replacing of roasters, and implemention of a sampling and testing plan in peanut processing facilities. Bill Pursley, AIB, Manhattan, KS, speaking on the topic "The Good, the Bad and the Ugly," talked mainly on Inspecting/Auditing and IQ. He explained practical problems in processing plants that he had visited recently, modes of contamination and problem solving techniques with effective elastration. Don Zink of FDA-CFSAN, in a talk on "The Return of *Salmonella*," showed that although *Salmonella* outbreaks from contaminated eggs have decreased, little progress is being made in regard to the appearance of *Salmonella* in processed foods. Special emphasis was placed on the presence of water in food processing plants and the risk it poses for potential *Salmonella* outbreaks. Like Paul Hall of ConAgra, Zink supports more rigorous, closely monitored HACCP plans for all food processing plants.

TECHNICAL SESSIONS

T1 – Laboratory Methods

Rocío Morales-Rayas, University of Guelph and Feifei Han, Louisiana State University

The session covered various approaches to detection of bacteria and viruses. Methods included conventional and molecular applications. Raj Mutharasan opened the session by presenting a ten-minute quantitative assay for detection of *Escherichia coli* O157:H7 in beef. 10 CFU/ml in ground beef were detectable by use of antibodies immobilized to a piezoelectric-excited sensor. Hong Wang described a biosensor coupled to immunomagnetic nanobeads for the detection of *Listeria monocytogenes* in chicken carcasses. After immunomagnetic separation, fluorescent markers were used to quantify the captured cells. Detection of 1–3 CFU/ml in less than two hours was possible with this method. Fabienne Loisy-Hamon demonstrated the use of magnetic silica for the extraction and purification of hepatitis A virus and Noroviruses group I and II from shellfish. After the separation method, a one-step real-time RT-PCR was used to quantify the viral particles. The method can be completed in 24 or 48 h, with a sensitivity of 5 copies per reaction. Julie Jean investigated the use of real-time NASBA for the detection of Norovirus in lettuce. Results were comparable to those obtained with TaqMan RT-PCR, with a sensitivity of 0.01 RT-PCR detectable units. An enzymatic pre-treatment with proteinase K was used to distinguish non-infectious viral particles. Yanbin Li described the use of an impedance biosensor, after separation with magnetic nanobeads, for detection of avian virus. The protocol allows detection in 30 min with a sensitivity of 10^2 EID_{50}/ml. Youwen Pan described how propidium monoazide can be used for enum-eration of viable cells of *Listeria monocytogenes* by use of real-time PCR. Feifei Han developed a new method, Loop-mediated Isothermal Amplification (LAMP), to detect *Vibrio vulnificus*, which could effectively amplify the ladder-like banding pattern specifically for the *V. vulnificus vvhA* gene. The results suggest that the LAMP technique may be adopted for rapid and sensitive detection of *V. vulnificus*. Chin-Yi Chen compared several methods of detecting and/or quantifying live/viable and dead bacteria to evaluate cell viability under different growth and stress condition. Leslie K. Thompson used the VIDAS® *Listeria* species Xpress (LSX) method to detect *Listeria* species in poultry, seafood, and vegetable products with 100% specificity, suggesting a next-day screen method for the presence of *Listeria* species in a variety of foods. Jingkun Li compared the cultural method, PCR and lateral flow immunoassay in rapid enrichment and detection of *Salmonella* in composite raw beef samples, indicating that proprietary enrichment should be followed by the lateral flow assay. Robert S. Tebbs developed a multiplex real-time PCR assay to identify 3 species of *Vibrio* and an internal positive control by use of a four-dye configuration which showed 100% specificity to all targets analyzed. This study indicated that multiplexed PCR assays could be designed for any set of pathogens to provide for detection and to define pathogen load. Jeongsoon Kim finished the session by introducing a new real-time PCR assay that uses a SYBR Green I for specific detection and enumeration of five pathogenic bacteria (*E. coli* O157:H7, *S. aureus*, *V. parahaemolyticus*, *L. monocytogenes* and *Salmonella* spp.) in food without enrichment.

T2 – Produce and Seafood

Hudaa Neetoo, University of Delaware and Feifei Han, Louisiana State University

Michael Cooley began the session by introducing the MultiLocus Variable number tandem repeat Analysis (MLVA) used for typing of *E. coli* O157:H7, suggesting that MLVA is an effective high-throughput investigation tool of the transport of *E. coli* O157:H7 in agricultural environments. Bassam A. Annous used hot water surface pasteurization at 76°C for 3 min for the inactivation of *Salmonella* on inoculated cantaloupe surfaces, which resulted in more than 5 and 3 log CFU/cm^2 reductions in *S. Poona* and in yeast and mold populations, respectively. Jay Neal found significant reduction of inoculated *E. coli* O157:H7 and *Salmonella* on baby spinach after electron beam irradiation, suggesting that it might be a viable tool for reducing microbial populations in fresh bagged spinach. Christina Hajdock developed a produce decontamination method that uses a combination of ultraviolet light and hydrogen peroxide on fresh cut produce. Brendan A. Niemira used a sodium hypochlorite wash vs. irradiation to inactivate *Escherichia coli* O157:H7 internalized in leaves of romaine lettuce and baby spinach. The results showed that ionizing radiation, unlike chemical sanitizers, could effectively eliminate internalized *E. coli* O157:H7 cells from leafy green vegetables, and that the pathogen is significantly less sensitive to irradiation in spinach leaves than in romaine lettuce leaves. Rachel McEgan developed micro-filtration coupled with flow through ELISA system to concentrate and detect *Salmonella* in sprouted seed spent irrigation water in 3 h. By using the optimized filtration step, it was possible to achieve a 1000-fold concentration of *Salmonella*. Brooke M. Whitney evaluated the use of multiplexed Real-time PCR for the detection of pathogenic *V. parahaemolyticus* in oyster homogenate. The gene targets associated with pathogenicity were detected in 16.7, 58.9, 56.7 and 40.0% of the 10-g oyster

homogenate enrichments during the winter, spring, summer and fall seasons, respectively. Despite the apparent presence of pathogenic Vp strains during all seasons, their isolation was complicated. Sivaranjani Pagadala isolated *L. monocytogenes* from 8.1% of the raw crab, 0.3% of the finished product and 5.8% of the environmental samples. The most contaminated environmental sites for *L. monocytogenes* were raw crab coolers (20.9%) and receiving docks (13.9%), suggesting that raw crabs are the primary source of *L. monocytogenes* contamination. Stephenie L. Drake used colony lift DNA hybridization to characterize the effect of extended deck storage of shellstock on the levels of *V. vulnificus* and *V. parahaemolyticus* in Gulf Coast oysters. Cheng-An Hwang demonstrated that *L. monocytogenes* is able to grow in salmon containing the concentrations of salt and phenol commonly found in smoked salmon at prevailing storage temperatures. Increasing the salt and phenol levels and decreasing storage temperatures extended the Lag Phase Duration (LPD) of the pathogen. Hudaa Neetoo showed the potential for using packaging films and edible coatings incorporating potassium sorbate (0.3%) and sodium benzoate (0.1%) to enhance the antilisterial effectiveness of nisin on cold-smoked salmon. Courtney Rheinhart demonstrated that the rate of microbial and sensory spoilage of croaker fillets is significantly affected by storage temperature, but not by film Oxygen Transmission Rate.

T3 – Antimicrobials, Sanitation and Non-microbial Food Safety

Hudaa Neetoo, University of Delaware and Jennifer Cascarino, University of Delaware

Lynne A. McLandsborough presented findings showing that treatment of *L. monocytogenes* biofilms with antimicrobial-loaded surfactant micelles modified the physical surface of the biofilms, possibly due to adsorption of surfactant, diffusion of antimicrobial into the biofilms, or removal of extracellular polymeric substances that surround cellular surfaces. George-John E. Nychas' presentation showed that natural antimicrobial agents may be as effective as the currently used chemical ones for sanitation purposes. Kristen A. Hunt's research showed that an iodophor compound was the only sanitizer effective against both planktonic and adherent bacterial isolates of *Escherichia coli* O157:H7. The importance of proper cleaning and sanitation procedures in the food industry and of methodology for recovery of bacteria were also outlined. Hiroshi Urakami presented his findings on the level of chlorine needed to inactivate feline calicivirus (FCV), a norovirus surrogate. His data demonstrated that FCV is inactivated with chlorine at 1 ppm if concentrations of organic substances are low. Manan Sharma's research showed that no *E. albertii* strains were more sensitive than *E.coli* O157:H7 and *Shigella* strains to heat, acid, and high pressure treatments. Brenda S. Patton's research focused on the effectiveness of the bacteriocin Colicin E1, found to be effective at low concentrations against *L. monocytogenes*. J. Marcelino Kongo assessed the levels of contaminating bacteria in 70 raw milk and cheese samples, as well as on working surfaces of seven certified dairy plants. The high counts of *Enterobacteriaceae* in cheese and the presence of *S. aureus* in raw milk and dairy plants reflected poor milk handling and sanitation conditions. Helen E. Arrowsmith demonstrated how cleaning regimes can be validated by use of allergen detection test kits in food factories. The kits were able to detect the allergen where it was known to be present. Cleaning was shown to decrease environmental levels of allergen, although traces of allergen remained in some instances, and no cross contamination was detected in non-allergen products manufactured following a run of allergen-containing product, after cleaning had taken place. Dr. Arrowsmith also showed that particular cleaning fluids can affect the performance of specific allergen test kits, resulting in false positive and negative results when used at different levels and in factory trials. However, no one test was influenced by all the cleaning fluids, nor did one cleaning fluid influence results of all the tests. Laundering was effective in removing residues from overalls, and no cross contamination with 'dirty' overalls was observed. Yun-Hwa P. Hsieh presented his research on the development of a Sandwich-ELISA assay for thermostable proteins in blood from animal feedstuffs, which achieved an overall accuracy of 100%. Panagiotis Georgakopoulos compared three extraction methods for the recovery of organophosphorus pesticides and showed that pesticide recovery decreased with increasing complexity of the food matrices of baby foods. Finally, the use of a new LC-UV/MS method in the quantification of Mycotoxins Deoxynivalenol, Masked Deoxynivalenol and *Fusarium graminearum* Pigment in Wheat and Rice Samples was presented by James J. Sasanya.

T4 – Dairy

Pratik Banerjee, Purdue University and Ravi Jadeja, Louisiana State University

Dayna L. Swiatek of University of Melbourne, Australia, presented her work on the comparative analysis of the effects of pasteurization and High-pressure Processing (HPP) on inactivation of bovine rotavirus (BRV). Using four different pressures (200, 300, 400 and 500 MPa) and four to seven different time points, it was shown that HPP appears to be as effective as HTST pasteurization for reduction of BRV. Matthew Ranieri of Cornell University presented the finding that raw milk samples treated with a temperature higher than the recommended temperature gave higher total microbial counts than did the standard process. When an aerobic plate count

was performed on milk samples treated at 72°C and 85°C, statistically significant by higher counts were obtained from the sample treated at 85°C. The speaker concluded that optimization of the HTST process is important to ensure better shelf life of fluid milk. Rosa Casillas presented data that showed that use of 3M "petrifilm" for aerobic counts plates for detection of *Geobacillus stearothermophilus* in UHT milk is rapid and effective alternative to traditional streaking methods. UHT milk was artificially inoculated and enriched for 24 h. With the new technique, growth was detected within 6 h, while with the traditional method up to 12 h was required to detect the growth. Anli Gao discussed his findings on the presence of *Mycobacterium avium* subsp. *paratuberculosis* (MAP) based on PCR and nested PCR analysis of feces and milk samples from a dairy herd with Johne's disease. The findings indicated that when these two methods were used, results with milk samples showed a correlation, but results with fecal samples did not. It was concluded that in order to obtain consistent results in tests for the presence of MAP in feces and milk, detection methods need to be standardized. High pressure processing has become increasingly preferred over other processing methods. Margaret Patterson presented findings of a study on the effects of milk concentration and pH on pressure inactivation of *Listeria monocytogenes* and concluded that SMP concentration and pH do not significantly affect it. Dennis J. D'Amico presented results of research to evaluate overall milk quality and the prevalence of four target pathogens (*Listeria monocytogenes*, *E. coli* O157:H7, *Staphylococcus aureus* and *Salmonella* spp.) in raw milk used for cheese making. The overall finding was that the milk intended for use in artisan cheesemaking was of high microbiological quality. Emily Mathusa discussed some natural processing methods, such as addition of 250 ppm nisin and /or high draining temperatures, which can effectively control *Listeria monocytogenes* in soft cheese. Speaking about the prevalence and ecology of *Listeria monocytogenes* in retail food establishments, Brian D. Sauders presented the finding that *L. monocytogenes* was isolated from some retail environments, but relatively infrequently from Ready-to-eat foods. He also highlighted the fact that molecular characterization indicated the presence of specific subtypes within specific environments. Richard K. Gast reported that controlling ambient temperatures during pre-refrigerated storage may play an important role in limiting *Salmonella* growth and penetration in eggs. Deana R. Jones presented findings on microbial levels and pathogen prevalence associated with restricted shell eggs. They found that, while the current pasteurization guidelines are based on *Salmonella* lethality, there is a need to reevaluate the guidelines to determine the efficacy of this intervention in controlling other pathogens. Priya Kadam described the egg monitoring program, including sampling procedures of *Salmonella*. The study reported that by 2007, *Salmonella* incidents in most egg products had decreased relative to 1995. Among the *Salmonella* spp., *S.* Heidelberg and *S.* Enteritidis were predominant, followed by *S.* Typhimurium and others.

T5 – Pathogens

Hudaa Neetoo, University of Delaware
and Reshani Nisansala Senevirathne, Louisiana State University

Kendra K. Nightingale opened the technical session with a presentation on the importance of internalins (i.e., *inl*A and *inl*B) in the pathogenesis of disease caused by *Listeria monocytogenes*. The presence of premature stop codons in *inl*A and its impact on virulence attenuation was underlined. Sarah McIlwham spoke about the use of hybridization techniques to uncover genomic differences in food, environmental and clinical isolates of *Listeria monocytogenes* and to identify specific genomic markers required for infection. Yvonne C. Chan presented her findings on the role of multiple transcriptional regulators on the growth of the psychrotrophic pathogen *L. monocytogenes* at refrigeration temperature. Yuewei Hu's research outlined the key role of negative regulators such as *Hc*A and *Cts*R in regulating transcription of certain genes in *L. monocytogenes* and the importance of this study in gaining a more comprehensive understanding of stress response systems in this pathogen. Haley Oliver spoke about the contributions of Sigma B to stress response and virulence in *L. monocytogenes* strains representing select lineages. Panagiotis N. Skandamis compared the survival of acid adapted or osmotically shocked *L. monocytogenes* and *Salmonella enterica* serovar Enteritidis PT4 in various appetizers at chill or ambient temperature; his findings reflected higher survival of *L. monocytogenes* than *Salmonella* in all cases. Jie Zheng presented her research on the use of an enhanced discriminatory scheme for PFGE-based subtyping of *Salmonella* Enteritidis. She described the use of several previously unexploited restriction enzymes in a subtyping scheme for *S.* Enteritidis. Maria Teresa Destro talked about the occurrence of potential virulence genes and integron-mediated resistance genes and their contribution to multiresistance phenotypes observed in the isolates. Faith J. Critzer analyzed *stx*1 and *mar*A genes in *E. coli* O157:H7 treated with sodium benzoate and the possible role of these genes in the survival of *E. coli* O157:H7 during exposure to sodium benzoate. Shlomo Sela presented results of her research aimed at identifying and characterizing EPEC genes involved in biofilm formation on abiotic surfaces. Her findings underscore a major role for curli and cellulose in EPEC attachment to and biofilm formation on abiotic surfaces. On behalf of Saumya Bhaduri, one of his colleagues presented their work on the comparison of virulence plasmid (pYV/pCD)-associated phenotypes in *Yersinia* species

and showed that the differential expression of certain phenotypic characteristics are potential tools in the identification of *Y. pestis* in clinical samples, animals, and food. Donglai L. Zhang presented results of his research, which aimed to uncover processes leading to inactivation of foodborne pathogens such as *L. monocytogenes* in hostile food environments by measuring the expression of the *tuf*A gene, which codes for the protein elongation factor EF-G, and viable cell counts. A lack of correlation between the *tuf*A QPCR signals and viable cell counts suggests further research is warranted to understand the physiological mechanisms responsible for survival of *L. monocytogenes*.

T6 – Meat and Poultry

Laura Bauermeister, Auburn University and Azadeh Namvar, University of Guelph

The methods and challenges of studying pathogen and spoilage microorganisms were the subject of this session. The first speaker, George-John Nychas, presented trend data associated with *L. monocytogenes* (Lm) in fermented sausages in Greece (30%), with lower percentages in Canada (20%) and UK (16%). The effects of selected environmental stresses (pre-inoculation stresses) on survival of Lm during the storage of sliced salami were evaluated. Post-stress survival was affected by pH, temperature and a_w. Steven Goodfellow described the behavior of *Clostridium perfringens* in cooked meat and poultry products in which inhibitors such as nitrite and lactate/diacetate combinations were used, in situations of large-diameter products and temperature abuse. The data from this study showed that use of inhibitors was effective in controlling *C. perfringens* in temperature abuse situations. Priti Parikh spoke on reducing Lm by use of UV light and dimethyl dicarbonate in chill brines used in Ready-to-Eat (RTE) meat facilities. Combined treatments were more effective than either treatment alone in reducing Lm. Avik Mukherjee examined the effect of using organic acids, potassium and calcium salts and sodium chloride to thermally inactivate *E. coli* O157:H7 in ground beef products. Organic acids and sodium chloride may provide added protection against *E. coli* O157:H7 in ground beef products, and sodium chloride will help reduce the cook loss in the product. Lilia Santiago determined the efficacy of surface sprays of octanoic acid, lauric arginate and Colicin E1 against *L. innocua* (Li) before packaging of RTE meats. All treatments were effective in reducing Li initially, however, throughout storage, lauric arginate and octanoic acid produced reductions in Li, while no reductions were found with Colicin E1. Brandon Carlson surveyed feedlot cattle to analyze the pre-harvest and carriage of *E. coli* O157:H7. He found that about 50% of the *E. coli* O157:H7 shed in the feedlot belonged to one strain. Shaohua Zhao reported on the prevalence, genetic diversity and antibiotic resistance of *Salmonella* spp. found in retail meats between 2002 and 2005. These surveillance data indicated that antibiotic-resistant strains of *Salmonella* are present and that the highest prevalence of these strains is associated with poultry products. Omar Oyarzabal compared the use of multiplex PCR, E-test, pulsed field gel electrophoresis (PFGE), multi-locus sequence typing (MLST) and cytotoxicity assays on mammalian cell lines to analyze *Campylobacter jejuni* isolates from Puerto Rico. He reported that PFGE was more discriminatory than MLST for these epidemiological purposes. Robert Miller determined the effectiveness of using logistics in scheduling to prevent cross contamination of *Campylobacter jejuni* in poultry processing plants. He determined that scheduling *Campylobacter*-free flocks before *Campylobacter*-positive flocks reduced the cross contamination on carcasses in the plant. Oleksandr A. Byelashov, using Lm, validated the USDA and FDA recommendations for home storage of frankfurters. He suggested that the current recommendations should be reevaluated. J. Stan Bailey reported on the effects of a reduced carcass rinse volume on recovery of certain organisms from post-chill chicken carcasses. He found that a reduced carcass rinse volume had no effect on the recovery of *Salmonella* but caused an increase in the recovery of *Campylobacter* and a decrease in the recovery of *Escherichia coli* and *Enterobacteriaceae*. The last speaker, Benjamin Chapman, surveyed food safety practices of church dinners. The surveillance indicated a lack of food safety knowledge among volunteer food preparers and a lack of sufficient facilities. General food safety training materials and programs will be useful to organizations such as these.

T7 – Epidemiology and Risk Assessment

Silvia Dominguez and Karla Mendoza, Rutgers University

Michael Cassidy discussed the use of fresh produce outbreaks data in developing risk assessments. These data can be extremely useful, but they may reflect unusual occurrences. The Public Health Agency of Canada has constructed an outbreaks database that can be useful for attribution analyses to increase the accuracy of risk assessments. David Lloyd presented an evaluation of risk management in the new product development process within food manufacturers in the UK. There is little knowledge of how small and medium size food companies manage risk during the product development stage. New strategies have been recommended to these companies for the development of new product risk assessment programs. Frank Pollari talked about the implementation of an enteric disease surveillance system in Canada. The objectives of this system are to detect changes in trends of human enteric disease incidence and pathogen exposure levels, to determine the source attribution, and to enhance the analysis and reporting of laboratory and epidemiological data. Challenges and

lessons learned from the implementation of this surveillance system were discussed. Marianne Miliotis discussed the development of risk profiles at FDA-CFSAN to assist regulatory decision making. Risk profiles provide risk managers with comprehensive understanding of food safety problems. Some of the risk profiles in current development are norovirus in RTE foods and HepA in fresh produce. Ligia da Silva presented a predictive model for the growth and survival of *Vibrio vulnificus* in Chesapeake Bay shell stock oysters. Bacterial population and growth rate as a function of temperature were modeled. The performance of the model was evaluated with use of the bias and accuracy factors, with excellent results. Shiowshuh Sheen presented the development of a cross-contamination model for *Listeria monocytogenes* in ham during the slicing process. *Listeria monocytogenes* transfer between the slicing blade and deli meats was shown to be a very complicated phenomenon. However, an equation describing this specific scenario was successfully developed. Cheng-An Hwang presented a model developed at USDA-ARS-ERRC for survival of *E. coli* O157:H7 during fermentation, drying and storage of fermented dry and semi-dry sausage. The levels of *E. coli* O157:H7 decreased during fermentation with the decrease in pH, and this change was described in an equation. A similar reduction was found during drying. Both equations were combined, providing a single equation able to estimate the reduction of *E. coli* O157:H7 after fermentation and drying for different pH and a_w. An equation was also constructed for the reduction of *E. coli* O157:H7 during storage, as a function of pH, a_w and temperature. Yohan Yoon presented a model for *L. monocytogenes* growth on commercial beef and turkey frankfurters as a function of temperature and time. The model was developed from observations of *L. monocytogenes* growth in the real food system. Validation of the model was successfully performed, and it may be useful in the control of *L. monocytogenes* in this kind of product.

T8 – Education

Pratik Banerjee, Purdue University
and Nancy Acosta, University of Birmingham

Paula J. Fedorka-Cray presented her study, which was aimed at determining the trend of *S.* Newport submitted to the National Antimicrobial Resistance Monitoring System – Enteric Bacteria (NARMS). PFGE analysis of the submitted isolates was performed, and a high degree of heterogeneity was observed. There was no correlation between PFGE analysis and phenotypic analysis. Robert B. Gravani discussed home outbreaks and noted that they still occur, despite consumer safety messages from the FDA and trade associations. He suggested that campaigns are not always effective because of unclear message, type of audience or topic. Results from a focus group reported that consumers are aware but do not follow recommendations and that barriers were related to knowledge, convenience, habits, and lack of risk perception, among others. He suggested that messages should be developed to stimulate behavioral changes. Gisela Kopper presented data on the current situation of Latin America's food-safety systems. These systems are still weak because of the involvement of various agencies, lack of trained personnel, low national priority, inaccurate surveillance and large number of SMEs. In order to increase knowledge in the field of food safety, The University of International Cooperation in Costa Rica has developed an Online Graduate Level program to improve the competencies of food professionals and/or government agencies personnel in food safety and management in Latin America and the Caribbean. The program includes food-safety science, legislation and management courses. Kofi Adu-Nyako presented results of his work to examine food safety risk perceptions, attitudes, knowledge, and behavior of food assistance recipients compared to persons having no food assistance. Descriptive statistical methods and logistic regression methods were used, with the Health Belief Model as the theoretical basis for the study. The study revealed that food assistance recipients may not be less knowledgeable and may have similar or better food-handling practices, compared to persons not receiving food assistance. Craig Harris presented the results of a study on how race and ethnicity play a role in food safety perceptions in the United States. A telephone survey was used; findings revealed that African-Americans are more likely than other groups to be highly concerned about food safety and related issues. Arzu Cagri-Mehmetoglu spoke on the public perception of food handling and food safety in Turkey. The survey study revealed that most of the highly educated and higher-income participants were well aware of food-safety perceptions. Ema Maldonado presented data on costs and benefits of implementing HACCP in Mexican poultry processing industries. Reported drivers to implement HACCP were to attract new customers, improve quality and decrease risk quality audits. The major costs reported were associated with external consults and record keeping; minor costs were for managerial changes and time. She concluded that there is a continuous demand in the Mexican industry for higher food safety standards.

ROUNDTABLES

RT1 – Using HACCP to Innovate New Processes in Retail Food Operations

Oleksandr Byelashov, Colorado State University and Carolina Naar, University of Tennessee

The use of temperature control for safety (TCS) criteria to innovate new processes was discussed by Donald W. Shaffner of Rutgers University, who opened the session. He discussed the process and the basis of evaluation of potentially hazardous foods and of determining performance criteria. This evaluation was used in generating the technical review and analysis of the issues in food safety and processing.

The FDA issues the Food Code to assist retail and food service segments of the industry in safe food handling, including heating and chilling of foods. However, the HACCP approach is needed in time and temperature control of foods that have been reformulated or in development of new products. The HACCP application for development of pasteurization values and hot holding limits for new processes at retail was discussed by Harshavardan Thippareddi (UNL). It was emphasized that the lethality step during the product manufacturing should take into account the chemical composition and physical properties of foods as well as food preparation conditions, such as relative humidity. For example, investigation of a *Salmonella* outbreak traced to beef jerky revealed that the processor used an adequate temperature for drying of the product, but the humidity was not sufficient to destroy the pathogen. Dr. Thippareddi concluded that a science-based approach should be used in the development of pasteurization values and hot holding limits at retail.

Vijay Juneja (USDA) discussed the importance of adequate chilling of foods, especially when implementing new processes in retail operations. At retail and food service establishments, cooking is normally done not for the purpose of destroying pathogens, but to achieve desired organoleptical properties of foods. Cooking heat may activate spores, which may then germinate and multiply to hazardous levels if the rate and extent of cooling is not adequate. HACCP programs require continuous monitoring and recording of internal temperatures in order to detect temperature deviations and take corrective actions. Therefore, to ensure microbial safety of foods, establishments need to use a science-based approach. Vijay Juneja presented the Pathogen Modeling Program (PMP), which may be useful for small meat processors in determining chilling rates of foods, thus helping them to comply with food safety regulations.

Robin Forgey (Costco) talked about the development and use of HACCP at Costco Wholesale Corporation. The key to success is to keep HACCP simple, so that the employees who implement HACCP can easily understand it. She also emphasized the importance of training reinforcement and the need for HACCP integration into the corporate culture.

To comply with the regulations, processors need to use performance criteria and apply a science-based approach to determine their validity for a specific product. After the presentations, Peter Snyder and Vijay Juneja led the discussion on the following topics: the need for explaining the reasons for performing the HACCP activities to personnel so that their duties are effectively performed; discrepancies in the food safety regulations enforced by federal agencies; the adequacy of the PMP for processed foods that contained various chemicals that may affect growth or destruction of pathogens; and the frequency of temperature monitoring in food processing.

RT 2 – The Management and Control of Chemical Hazards in Food

Carolina Naar, University of Tennessee, Knoxville and Priti Parikh, Virginia Polytechnic Institute and State University

Heavy metal contamination of seafood, melamine contamination of pet food, food allergens, acrylamide formation, and pesticide and other chemical residues contamination have raised new concerns about health risks associated with chemical hazards in certain foods.

Michael Bolger (FDA) mentioned that lead in food represents a potential public health problems because it disrupts the functioning of brain neurotransmitters and can disturb cellular processes that depend on calcium. The body stores lead mainly in bone, where it can accumulate for decades. However, the bioavailability and toxicokinetics of ingested lead are age specific. The blood lead level of concern in adults is considered to be between 25–30 micrograms per deciliter (µg/dL) of blood; the level of concern in young children and pregnant women is only 10 µg/dL.

David Kendra (USDA) discussed the problems related to mycotoxins in foods, including their detection. He specifically mentioned that "*dose makes the response*." Mycotoxins intakes are related to the amount of particular foods ingested in the daily diet of certain populations, for example, people living in Africa are exposed relatively often to mycotoxins because of the large amount of corn in their diets. Therefore, the level of exposure needs to be taken into account when limits are established for the presence of these naturally occurring toxins. Mark Moorman, of Kellogg Company, agreed with David Kendra that dose makes the response. He pointed out that food allergens are common proteins that trigger the immune system and that the threshold of these allergens is not known. Moreover, dose of the allergen differs in different people, which makes this

an extremely complex problem. Primary reasons for food recalls due to allergens include faulty packaging, poor sanitation, presence of multiple ingredients in foods, etc. Therefore, allergen-control programs must be implemented.

Jeffrey Keithline, of Keller and Heckman, LLP, discussed a specific example of printing ink in infant milk to illustrate the problems related to packaging residues in foods. With this example, he showed that although in many cases packaging materials pose no health risk, consumers perceive them as a risk. Also, not enough regulations exist for some components such as printing ink, which makes it difficult for food companies to deal with some issues.

Larry Keener, of International Product Safety Consultants, discussed a practical approach to develop strategies to control the presence of pesticides and other chemical hazards in food by establishing a supply-chain collaboration from the grower to the consumer, and establishing risk assessment/management considerations that include monitoring and verification schemes.

Peter Slade (NCFST) identified chemical hazards as a major problem in foods. Some of the reasons for presence of chemical hazards are cross-contaminating food allergens, agriculture procedures, and cleaners or sanitizers used in food processing plants. He mentioned that cGMPs/Prerequisite programs, letter of guarantee from the supplier, or CCPs (Critical Control Points) can control chemical hazards in foods. He also raised some unresolved issues, such as lack of detection and test methods for adulteration, lack of advancement in risk analysis to facilitate hazard assessment in HACCP (e.g., dioxins), and process-induced contamination (e.g., acrylamide/furan).

RT3 – Water Emergencies: Too Much, Too Little, Too Late and What is the Plan?

Elizabeth Hillyer, University of Guelph, and Tiffany Johnson, Alabama A&M University

The focus of this round table session was to outline the impact and consequences of water emergencies such as shortages, floods, and environmental contamination, as well as to consider how these events affect communities both during the crisis and in the aftermath. Chuck Gerba began the session by outlining the impact of water shortages on irrigation water. Pathogen sources in irrigation water include livestock, pets, storm sewers, irrigation return flows, urban centers, and migrating birds. Drought heavily increases the risk of contamination because of the limitation in the supply of potable water. With longer intervals between rainfalls, fecal matter accumulates and contamination rises as water levels decrease and canals become stagnant. Little is known about the microbial quality of water, and most standards of irrigation water include reclaimed waste.

Next, Richard Gelting explained the impact of flooded water supplies on foodservice operation recovery after Hurricane Katrina. Many complex problems were associated with drinking water in the aftermath of Katrina. These included draining the water from the city, problems with drinking water such as waterline breaks, advisories to boil water, the use of water for fire protection only, and attempts of restaurants and hotels to reopen without a safe water supply. Because of the need for mass-feeding operations, temporary water tanks and hand wash stations were essential. As citizens began using water, waste water was produced, and as a result of the sewer system's inefficiency, raw sewage leaked into the Mississippi River. Ultimately, the issues that surround drinking water in the aftermath of natural disasters are layered and complex as businesses attempt to reopen.

Michael Brodsky gave a brief overview of the Watershed Event in Walkerton, Ontario, in 2000. The cause was found to be both *Escherichia coli* O157:H7 and *Campylobacter*. A detailed inquiry revealed that the source of contamination was manure in a well from a nearby dairy farm. The dairy farmer followed good animal husbandry practices; however, the system operators at the treatment plant were inadequately trained. Prevention and monitoring of microbial pathogens in drinking water is of utmost importance, and water systems need ample funding.

Finally, Kevin Morley described the utilities perspective on economic issues. Establishing resiliency depends on utilities helping utilities, critical customers and planning considerations. The Wastewater Agency Response Network (WARN) organizes utilities within a state, but all water emergencies are local and require a local response. He also discussed the effects of denial of service: the impact of long-term water shortage, alternative water supply and the associated economic effects. The panel responded to questions from the audience, including the questions on limitation of recreation water use during a drought, testing beyond that required for certification in the case of Hurricane Katrina, standardized methods for pathogen testing, utility partnerships, and the possibility of creating a Waternet — an environmental health specialist network with sentinel sites.

RT4 – With Over 100 Years of Experience in Food Safety, We Think...

Kirsten Hirneisen, University of Delaware and Nancy Acosta, University of Birmingham

Food has likely never been as safe as it is today, but it remains a significant public health issue. It is estimated that one-third of the individuals living in developing countries become ill each year from food and water. From the origins of food preservation to modern interventions, there have been advances and impediments in food

protection. This symposium poses the question "What is the best and, conversely, the worst thing that has happened to food safety?" Speakers will be given creative liberty to use their experience in the field and their unique vantage points to address the question. This symposium uniquely takes advantage of the expertise of these speakers who have significantly contributed to advancing food safety worldwide. This is an informal discussion that acknowledges past accomplishments and challenges but also describes changes in food safety that have occurred or that will occur on a global scale. This symposium aims to generate discourse on innovative approaches to reduce the burden of foodborne illness and to encourage members to view food safety as a dynamic field that requires awareness of all perspectives.

- Elsa A. Murano, Texas Agricultural Experiment, College Station, TX, USA
- James Jay, Stone Mountain, GA, USA
- Katherine M.J. Swanson, Ecolab Inc., St. Paul, MN, USA

Best things:

- global historical perspective (fire, soap and water, quat)
- HACCP → systematic Food Safety management system, implemented, practiced every day, not a regulation /book but a management tool
  - Hardest part about hazard analysis is determining what is a hazard that must be controlled?
  - Example: Pillsbury and FDA

Great things:

- rapid methods (actionable information provided)
- clean in place (CIP) → reproducible, effective cleaning results for miles of pipes or huge tanks
- FoodNet and PulseNet
- Sanitizer evolution
- Risk-based approach to food safety management
  - Global harmonization and systematic approach; we eat food from all over the world
  - Economic and human costs

Worst:

- Outbreaks (despite the fact that they drive funding)
- negative press
- lost trust

Unfortunate:

- misapplication of HACCP
- trying to test safety into products
- emphasis on negative media with little proactive information
- epidemiological emphasis on illness causing agents
- epidemiological emphasis on illness testing → CDC summaries reported outbreaks every 5 years (needs to occur more rapidly)
- Robert Tauxe, CDC-NCID-CCID, Division of Bacterial and Mycotic Diseses, Atlanta, GA, USA

Best:

- 1906 novel, The Jungle, Upton Sinclair (nauseated the nation)
- Technological advances (pasteurization)
- Catastrophic outbreaks (Jack-in-the-Box, 1993) (*C. bot* in olives, 1907)

New catastrophe → epidemiological and lab investigation → applied target research → preventative measures

Add surveillance for public health prevention:

→ Surveillance ↘

Prevention ←epidemiology and lab investigation

↖ Research ↙

RT5 – Panel on the Science Behind Temperature Control of Potentially Hazardous and High Risk Food

Heidi Weinkauf, Iowa State University and Hudaa Neetoo, University of Delaware

The 2005 FDA Food Code introduced a new term, Potentially Hazardous Food — Time/Temperature Control for Safe Food, or PHF-TCS. This newly introduced term refers to "a food that requires time/temperature control for safety to limit pathogenic microorganism growth or toxin formation." The term does not include foods that do not support the growth of or toxin formation by pathogenic microorganisms, even though the food may contain a pathogenic microorganism or chemical or physical contaminant at a level sufficient to cause illness or injury. The questions "Why the change? Why is there a need for yet another acronym for the retail food industry to remember?" as well as possible reactions of the food industry and the states in the face of this new Code were discussed during this roundtable. Richard Linton, Purdue University, described how this definition utilizes a two-step process to determine whether a food falls under the definition of PHF/TCS. Gale Prince, Kroger, then discussed how food and retail have changed over the years following the changes in the Food Code, and outlined the ways in which the history of PHFs continues to be used in new product formulation, of which now includes: (1) IFT decision tree, (2) USDA Pathogen Modeling Program, (3) Formulation adjustments, (4) Use of time (shelf life, code date) and (5) Challenge studies. Canice Nolan spoke about the EU's approach to PHFs. The EU does not have a definition for PHFs as they view it as industry's responsibility to

produce and supply foods that are safe. Jeff Farber, representing Canada, defined PHFs, according to the Canadian Code, which is similar in some of its provisions to the FDA Food Code. The Canadian definition does not include foods that have a pH of 4.6 or below and foods that have a water activity of 0.85 or less. Dr. Farber also mentioned that similar to the EU, Canada currently has no regulations with respect to PHFs and no plans to implement any. According to Deon Mahoney from Food Standards Australia, New Zealand, there are regulations in place that define PHF as well as the specific temperature requirements for a food business to receive, store, display, or transport a PHF. He expressed his confidence in the Australian standards with respect to PHF, especially in light of the fact that Australia is a major food exporter. The United Kingdom, on the other hand, does not use the term "potentially hazardous food" but identifies foods that require temperature control in the Food Safety (Temperature Control) Regulations, (1995) SI 1995/2200. The panel urged that the new term be redefined to provide more guidance for foodhandlers, especially with regard to proper storage conditions. The need to define proper Product-Assessment (PA) techniques, establish national challenge tests, emphasize proper education, clarify the definition of PHF through appropriate PA techniques and ensure effective communication between the industry and the regulatory bodies about the implication of this new definition were emphasized.

RT6 – Food Safety Laws: Political Science or Food Science

Oleksandr Byelashov, Colorado State University and Ben Chapman, University of Guelph

Food safety laws are formed to protect public health and contain both food science and political components. The participants in this session, organized by Caroline Smith DeWaal, CSPI, suggested that there is a need for a science-based approach in developing regulations and performance standards.

Recent international food safety incidents highlighted the need for modernization of food systems, specifically in the US. In addition, there is a need for collaboration between food safety agencies on an international level so that developing countries can achieve high levels of food safety and continue participation in the international trade necessary to fulfill world food demands.

Michael Doyle, UGA, discussed the elements of an effective food safety system, which include science-based policies and regulations; a central system for monitoring and surveillance; the need for participation of local and state agencies and nationwide adherence to the federal law; adequate resources to provide surveillance; and consumer education. Dr. Doyle concluded that Congress needs to establish a framework for implementation of a science-based approach in the development of food safety laws and suggested the creation of a single federal system.

The need to building a prevention-oriented food safety system was discussed by Mike Taylor (UM). Dr. Taylor stressed that greater emphasis must be put on prevention and minimizing of food safety hazards. However, prevention should not undermine the need for a rapid response to food safety incidents. Dr. Taylor also emphasized the role of a science-based approach and the consensus between food safety agencies in development of the food safety performance standards and need for their enforcement.

Peter Ben Embarek, WHO, discussed the factors that drive changes in food safety approaches. He suggested that the main driving force for changes in food safety policies should always be public health. Dr. Ben Embarek also talked about the need for an integrated and effective food safety system that must give priority to consumer protection. He concluded that the keys to safe world food supplies are integrated efforts and shared responsibilities of all parties throughout the food chain.

Jenny Scott, GMA/FPA, provided a US industry viewpoint on the state of the current food safety system. Dr. Scott suggested that although there are gaps, the food system is not in a food safety crisis. She discussed the need for a comprehensive approach for modernizing the food safety system, which includes the assessment of the current system and strong objectives for solving any identified problems. Dr. Scott also highlighted the food industry's responsibility for a safe food supply. She concluded that the current food safety system emphasizes reaction to arising food safety issues, and it needs to be changed to focus on prevention.

Following the presentations, Frank Yiannas convened a panel discussion. Among the issues discussed were the basis of the food safety performance standards; possible solutions for solving food safety issues in developing countries; time period required for the transition to a new functioning food safety system in the US; and consumers' confidence in the federal agencies.

Highlights of the Executive Board Meeting

July 6–12, 2007

Lake Buena Vista, Florida

The following is an unofficial summary of actions from the Executive Board Meeting held in Lake Buena Vista, Florida on July 6–12, 2007.

Approved the following:

- Minutes of April 12–13, 2007 Executive Board Meeting
- Approved Affiliate Charter for the Australian Association for Food Protection
- Approved Jeffrey Farber as Editor for the *IAFP Report*
- Raised the honorarium for Developing Scientists Competition winners to $200, $400 and $600 for third, second and first place, respectively
- Guidelines for Ethical Conduct

Discussed the following:

- E-mail votes taken since the last meeting
- Committee recommendations
- IAFP 2007 Board responsibilities and schedules
- Committee meeting and exhibitor contact assignments
- Banquet script review
- China International Food Safety & Quality, September 12–13, 2007, Beijing
- European Symposium, October 18–19, 2007, Rome, Italy
- Latin American Symposium, June 2008, Brazil
- Support of ICMSF Symposium in Singapore
- Participation in SQF International Conference, November 7–9, 2007, Nashville, Tennessee
- New *FPT* cover design
- Non O157 *E. coli* white paper
- International Food Allergen Icons
- NSF Food Safety Award Jury representation
- Commercialism issue in abstract submissions
- WHO–NGO Update
- 3-A Sanitary Standards, Inc.
- Sustaining Membership benefits
- *FPT* paper – spinach article
- Status of IAFP Foundation fundraising efforts
- bioMérieux Foundation proposal
- Recognition system for IAFP Foundation contributors
- Food Microbiology Research Conference dissolution
- Signing of fiduciary cards
- Review of IAFP 2007
- Update on Member dues restructure
- Review of April 2007 financial statements

Reports received:

- *IAFP Report*
- *Food Protection Trends*
- *Journal of Food Protection*
- IAFP Web site
- Membership
- Advertising update
- Board Members attending Affiliate meetings
- *Affiliate View* newsletter
- University Speaker program
- Future Annual Meeting schedule
- Exhibiting (IAFP On the Road)

Next Executive Board meeting – November 13–14, 2007.

Minutes of the International Association for Food Protection 94th Annual Business Meeting

July 10, 2007
Lake Buena Vista, Florida

President-Elect Gary Acuff welcomed attendees and introduced President Frank Yiannas.

Moment of Silence

President Frank Yiannas asked those present to observe a moment of silence in memory of departed colleagues. He noted that two long-time members and colleagues, Nobi Tanaka and Alex von Holy, had passed away in 2007 and would be greatly missed by the food safety community.

Call to Order

The Annual Business Meeting of the International Association for Food Protection was called to order at 12:22 p.m. at the *Disney's Contemporary* Resort in Lake Buena Vista, Florida. A quorum was present as defined by the IAFP Constitution.

With the approval of the Executive Board, President Yiannas appointed Randy Daggs as Parliamentarian for the Business Meeting.

Minutes

Minutes from the IAFP 93rd Annual Business Meeting which were published in the November 2006 issue of *Food Protection Trends* were approved after a motion from Paul Hall and a second from Michael Brodsky.

President's Report

President Frank Yiannas reported on programs and activities of IAFP over the past year. He reported that Membership has grown to 3,214 Members prior to the Meeting, 23 gold and silver sustaining members with 15 being gold members. The dues restructure that includes a base membership of $50 and optional journal benefits is working, *FPT* submissions are strong and a new cover design is planned beginning with the January 2008 issue, *JFP* is currently read in 69 countries, and the Association has a new Affiliate; the Australian Association for Food Protection.

President Yiannas noted that the Annual Meeting attendance was at a new record of 2,080 at last report, all exhibit booths are sold, sponsorships are up and he emphasized we should be very proud of our Association.

Upon conclusion of his report, President Yiannas presented Presidential Recognition Awards to Bob Bracket, Gale Prince, Anna Lammerding and Jack Guzewich for their roles in encouraging him to get more involved with IAFP. He also presented an Award to Michael Brodsky who has offered him continued support throughout his career.

Tellers Committee Report

Amy Simonne, Teller, reported there were two ballots sent to the membership over the past year. The first ballot was to approve revisions to the IAFP Constitution. There were 708 valid ballots with 696 in favor of the revision. It was accepted. A motion made by Paul Hall and seconded by Gale Prince to accept this report and destroy the ballots was approved.

The second ballot was for the election of the new Executive Board Secretary. There were 716 ballots received. Lee-Ann Jaykus was elected as Secretary for the 2007–2008 year. A motion by Gale Prince and seconded by Paul Hall to accept the report and destroy the ballots was approved.

JFP Management Committee Report

Chairperson Maria Teresa Destro reported that submissions to the *Journal of Food Protection* are stable and that the Committee will be keeping an eye of the trends of submission. Recommendations were made to the Executive Board to develop a marketing plan for IAFP and *JFP* specifically for developing international sectors and to approve John Sofos as editor for another 4-year term.

FPT Management Committee Report

Chairperson Jinru Chen reported that *FPT* submissions last year were 24. The Committee discussed and it was decided that the new cover page design containing 3 small photos will be used beginning in 2008. The Editor's expiring term was discussed; the Instructions for Authors will be reviewed and revisions suggested, and the Committee has asked to have older *DFES* research articles scanned and made available electronically online.

Foundation Fund Report

Gale Prince, Chairperson, reported that the Foundation Fund has raised over $200,000 in 2007. He reported he had offered a challenge to attendees at the Opening Session that he would match $5,000 in contributions to the Foundation. He noted that one of the exhibitors had mailed a card to attendees prior to the meeting requesting they bring the card to their booth at the meeting. They indicated they would make a contribution to the Foundation for each card received. Upon conclusion of his report, the Florida Association for Food Protection (FAFP) asked to be recognized and then offered an entertaining galactic presentation, which concluded with a contribution to the Foundation Fund of $5,000. Gale thanked FAFP for their sensational presentation and generous contribution.

Affiliate Council Report

Chairperson Maria Teresa Destro reported that Roger Cook was elected as the new Affiliate Council Secretary; a sub-committee was appointed to organize an Education Session to be held during the Affiliate meeting and discussed ways to increase submission of Affiliate Annual Reports. She noted that an Affiliate slide show was created for and is showing in the exhibit foyer.

Carl Custer had 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 a productive year. The Association has made strides in terms of its international involvement. It is hoped that the next European Symposium scheduled to take place in Rome, Italy will have increased attendance. The Association has provided assistance to World Services for a conference to taking place in Beijing, China, and we are planning to hold an international meeting in Brazil during the second quarter of 2008.

David reported on the financial condition of the Association and stated that as of August 31, 2006, the Association's General Fund held a balance of $578,245. David stated the financial goal for IAFP is to hold 50 percent of its annual budget in the General Fund and that we are about half way there. He reported that IAFP is in the best financial condition it has ever been since he joined the Association in 1993.

David thanked the IAFP Staff for their excellent work. He also expressed his thanks to the IAFP Board and Members for the support they provide year-round.

At the conclusion of David's report, a motion to accept all reports was made by Michael Brodsky and seconded by Fred Weber. It was approved.

Unfinished Business

There was no unfinished business.

New Business

There was no new business.

Adjournment

A motion to adjourn the meeting made by Bob Sanders and seconded by Carl Custer was approved. The meeting was adjourned at 1:04 p.m. by President Frank Yiannas.

Respectively Submitted,
Vickie Lewandowski, Secretary

Committee Minutes

Food Protection Trends Management Committee

Members Present: Jinru Chen (Chairperson), Maria Teresa Destro, Richelle Beverly, Michelle Danyluk, Wendy Warren-Serna (on behalf of Gina Bellinger), Peter Bodnaruk, Montserrat Iturriaga, Maria Nazarowec-White, Peter Taormina, LeeAnne Jackson, Charles Otto and Kathleen Rajkowski.

Visitors Present: Leon Gorris, Richard Whiting, Christine Bruhn, Mariza Landgraf, David Golden, Doug Powell and Larry Beuchat.

Board and Staff Members Present: Stan Bailey, Frank Yiannas, Gary Acuff, Vickie Lewandowski, Lee-Ann Jaykus, Donna Bahun and Lisa Hovey.

Meeting Called to Order: 2:02 p.m.

Recording Secretary of Minutes: Michelle Danyluk.

Old Business: Jinru Chen welcomed everyone, introduced the five new Committee Members, and acknowledged Donna Bahun, the production editor, and the five departing members including the departing chairperson, Dr. David Golden for their dedications to the journal. Julian Cox was elected as the vice chairperson of the committee. No additions or modifications to the agenda were offered. Frank Yiannas gave a brief update on the progress of the association, including membership, *JFP* and *FPT* submission rates, Web site, affiliates, annual meeting, foundation contributions, student activities, European symposia, and rapid response symposium. David Tharp gave a further update on the European symposium. He noted that the association is doing very well financially, and it is in the 4th year with positive funds. Copies of the Antitrust Guidelines were distributed. Minutes of the 2006 meeting were approved without change. Donna Bahun reported that the up-to-date number of submissions in 2007 has increased to 24 manuscripts, 2 of which were rejected.

New Business: *FPT* Cover Pictures: A sample of the new *FPT* cover was shown. Stan Bailey indicated that if the 3 pictures on the cover were changed monthly, a total of 36 pictures would be required for the 2008 issues of the journal. Due to the lack of pictures in the current picture library, perhaps 3 pictures should be selected and used without alternation for at least one year. Meanwhile, additional pictures will be collected from various sources. Christine Bruhn suggested the possibility of buying pictures from the World Wide Web. David Golden believed that the best pictures could come from interested members who read the journals. Questions were raised on whether the pictures on the cover should relate to the articles inside the journal. Donna Bahun addressed the urgent need of finding three pictures to publish in January, 2008. Doug Powell suggested that one of the cover pictures should reflect "retail". The copyright issues of pictures were addressed. The possibility of asking IAFP members to submit pictures to the library was suggested. Maria Nazarowec-White suggested that each member of the *FPT* Management Committee submit three pictures prior to the next annual meeting. It was proposed that the contributing authors submit a picture that reflects the content of their manuscript. The required picture submission will be included, and the quality of the picture will be defined, in the revised instruction to the authors.

Technical Editors: Ed Zottola, whose term is ending in December, 2007, has requested to be renewed for a 2-year term as a technical editor. The committee recommends appointing a new technical editor with a 4-year term. The committee also recommends appointing an alternate technical editor. The addition of an alternate editor is deemed essential in the event that the primary editor is unavailable.

Instructions to Authors: Michelle Danyluk brought up problems with the current instructions to authors, particularly the instructions for table and figure formats, online submission, and continuous line numbering requirements. Jinru Chen appointed Michelle Danyluk, Richelle Beverly, and LeeAnne Jackson to form a sub-committee to address this issue, pending board approval.

Publications in *FPT*: Doug Powell asked if there are any comments over the new format of the "Thoughts on Food Safety" piece ran on the back page of *FPT*. The format is acceptable to the committee members. Doug indicated that more topics and contributors are needed for the Back Page opinion piece.

The possibility of publishing white papers in *FPT* was discussed. Peer-reviewed and fast-track peer reviewed manuscripts were defined. The committee agreed that opinion articles should be put in a separate category from peer-reviewed manuscripts.

Christine Bruhn has submitted a manuscript that is currently at galley stage. The manuscript has, however, not gone through the peer-review process. The committee recommends that an executive board's action be taken in the absence of Ed Zottola so that the manuscript can be handled in a timely manner.

Old Research Articles from *DFES*: Christine Bruhn would like older articles from *DFES* to be available online. Donna Bahun responded that all articles that are available using her current software are available Online. The possibility of scanning in older articles was discussed, as has been done with the articles in *JFP*.

Recommendations to Executive Board:

1. The three *FPT* cover pictures stay the same in 2008, and a picture library will be generated by soliciting pictures from authors, committee members, and general members, or through purchasing from commercial sources for potential use in the future.
2. The executive board assigns reviewers for the manuscript submitted by Christine Bruhn et al., in the absence of Ed Zottola, so that the manuscript can appear as a peer-reviewed article in *FPT*.
3. The appointment of a new Scientific Editor for a 4-year term.
4. The appointment of an alternate Scientific Editor.
5. The instructions to authors for *FPT* are reviewed and revised. The committee has appointed a sub committee to review and revise these instructions pending board approval. The subcommittee includes Michelle Danyluk, Richelle Beverly and LeeAnne Jackson.
6. The older *DFES* research articles are scanned and made available electronically, as many of these articles have very limited availability.

Next Meeting Date: August 3, 2008.

Meeting Adjourned: 3:58 p.m.

Chairperson: Jinru Chen.

Journal of Food Protection Management Committee

Members Present: Maria Teresa Destro (Chairperson), John Bassett, Kathryn Boor, Scott Burnett, Faye Feldstein, Judy Greig, Mark Harrison, Loralyn Ledenbach, Kathleen O'Donnell, Joseph Odumeru, Tina Pedroso, P.C. Vasavada, Michael Davidson, Joe Frank, Elliot Ryser and John Sofos.

Board and Staff Members Present: Frank Yiannas, Gary Acuff, Stan Bailey, Lee-Ann Jaykus, David Tharp, Lisa Hovey, Tamara Ford and Didi Loynachan.

Visitors Present: Larry Beuchat and Payton Pruett.

Meeting Called to Order: 10:05 a.m.

Recording Secretary of Minutes: Lori Ledenbach.

Old Business: The agenda was reviewed and approved. The minutes from the 2006 meeting were reviewed and approved.

New Business: Report from the IAFP President, Frank Yiannas: Frank reported that IAFP membership had an increase of 10%, perhaps due to the new fee structure that was put in place with a less expensive base membership fee. IAFP currently has 3,214 members, 23 gold and silver sustaining members (up from 18 last year) of which 15 are gold sustaining members (up from 8 last year). There will be a new design for the *FPT* cover, and all *FPT* issues from 2000 to the present are online. There is a new affiliate this year from Australia, and several other new affiliates are being worked on. Attendance this year should set a new record, close to 2,000. All exhibit booths are sold, and sponsorships are up. There is almost $606,000 in the Foundation Fund. The 2nd European symposium was held last fall, and the 3rd one will be in Rome in October this year. IAFP also held a Rapid Response Symposium on the safety of leafy greens 3 weeks after the spinach outbreak and it was well attended.

Report from the IAFP Office: David Tharp provided an update of activities for the last year. There will be IAFP sponsored programs in China and in Europe this year and Brazil in 2008. The general fund has shown an increase as of August, 2006 of $75,000, to a total of $578,000. The goal is to have approximately double this amount in the fund.

Report from the Scientific Editors: Joe Frank presented the report from the scientific editors, Mike Davidson, Joe Frank, John Sofos, and Elliot Ryser. They reported that volume 69 of *JFP* (2006) contained 3,100 pages and 430 articles, including 421 research papers, and 9 review and general interest papers. This compares to volume 68 (2005), which contained 2,768 pages and 393 reports. The length of time between receipt of manuscripts and publication was reduced to an average of 8.1 months, probably facilitated by the manuscript handling system. Researchers from countries other than the US authored 54.7% of the articles in volume 69, representing 41 countries. The Editorial Board has 148 members, and two members sadly passed away – Dr. Sue Hefle and Dr. William Fett. Volume 70 (2007) contains 1,780 pages in the first seven months, compared to 1,764 for the same time period in 2006, and contains 248 papers, the same number as volume 69. Six fewer manuscripts were submitted for publication in 2006 (659) than in 2005 (665), and as of June 15, 2007, 322 manuscripts have been submitted in 2007 compared to 324 at the same time last year in 2006. These numbers indicate consistent numbers of submissions over the past 3 years. The estimated number of issues waiting to be published is currently 1.78 compared to 2.21 in July 2006, which is considered a desirable backlog for the journal.

A concern was raised that this leveling off of submissions may be related to page charges, and we will continue to watch this issue.

Report from Administrative Editor: Tamara Ford reported that 100% of journal submissions are online, and that issues of *JFP* from 1994 to the present are now online as well. As of June 22, 2007, *JFP* had 763 print subscribers and 159 online subscribers. There were two articles from the National Advisory Committee on Microbial Criteria for Foods published in the January issue and three foodworker articles from the Committee on Control of Foodborne Illness will be published in July, August and September.

Old Business: *FPT* and *JFP* now contain ads for reasons to publish in *JFP*, and these are also listed on the IAFP Web site. The board approved our recommendations to

include information on ComBase in letters to authors whose submissions have been accepted for publication, as well as redefining the definition of previously published to accommodate public access requirements.

New Business: The question was raised as to whether there is a goal or plan regarding what is the desirable number of papers we ant to have published in *JFP* each year. John Sofos replied that the current priority is to the speed of publication, rather than the number of submissions. The board had decided last year that until the page charges appear to become a real issue, they will not be discontinued, since they represent a considerable source of income. Discussion ensued regarding the issues of continuing access and the fact that younger academics usually do not have sufficient budgets to pay for page charges, so they will go to another journal that is free instead. Gary Acuff proposed that a sub-committee be formed to stay on top of this issue and develop a "Plan B" for sources of funding to be ready in case the page charges do eventually lower the number of submissions to an undesirable level and need to be eliminated. A motion was approved to form this subcommittee, with Elliot Ryser as chair with John Bassett and Larry Beuchat as members.

Faye Feldstein proposed that a marketing plan be developed to study *JFP* and IAFP access to "middle-level" sectors of international markets (not the most educated nor the poorest). This plan would determine what is currently available to these markets, where the gaps are, and what these sectors want in a professional organization and journals.

The motion was approved to keep John Sofos as a scientific editor for another 4 years.

Recommendations to Executive Board:

1. Develop a marketing plan for IAFP in general and *JFP* specifically for developing international sectors.
2. Reappoint John Sofos as Scientific Editor for another 4-year term.

Next Meeting Date: August 3, 2008.

Meeting Adjourned: 11:15 a.m.

Chairperson: Maria Teresa Destro.

Program Committee

Members Present: Emilio Esteban, Linda Harris, Kalmia Kniel, Alejandro Mazzota, Susan McKnight, Indaue Mello-Hall, Randall Phebus, Donald Schaffner, Gloria Swick-Brown and Mary Lou Tortorello.

Members Absent: Joan Menke-Schaenzer and Pascal Delaquis.

Board Members and Staff Present: Gary Acuff, Stan Bailey, David Tharp, Lisa Hovey and Tamara Ford.

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

Recording Secretary of Minutes: Emilio Esteban.

Summary of Activities and Actions Taken: Lee-Ann Jaykus and Don Zink will be leaving the Committee at the conclusion of IAFP 2007. 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.

New members who join the Committee this year are Kalmia Kniel and Mary Lou Tortorello. Indaue Mello-Hall will serve as Vice Chairperson for IAFP 2008 and will become Chairperson for IAFP 2009 in Grapevine, Texas.

The Committee served as a forum for groups wishing to present symposia and workshop proposals for IAFP 2008. At the Wednesday committee meeting, 56 symposia and 6 workshop proposals were submitted. Further review of all symposia will be made during the Thursday meeting.

Recommendations to Executive Board: None.

Next Meeting Date: February 15–16, 2008.

Chairperson: Emilio Esteban.

3-A Committee on Sanitary Procedures

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

Members Absent: Don Wilding (Chair), Sherry Roberts, 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: Dan Erickson, Dennis Gaalswyk and Allen Sayler.

Board Members/Staff Present: Vickie Lewandowski.

Meeting Called to Order: 10:01 a.m. (by Ronald H. Schmidt, Acting Chair).

Recording Secretary of Minutes: Ronald H. Schmidt, by default.

Old Business: A report from 2007 3-A Meeting (Milwaukee, WI in May) was jointly presented by those who attended that meeting. A report on 2007 3-A standards activities submitted by Don Wilding, CSP chair, was presented. During the last year, eight documents have made it to publication stage but this total includes complete revisions as well as proposals which changed only a portion of the document. These include: 53-03 Compression Valves, 21-01 Centrifugal Separators, 23-05 Equipment for Packaging Viscous Product, 26-05 Dry Product Sifters, 88-00 Machine Leveling Feet, 11-09 Plate Heat Exchangers, 20-28 Plastics, 84-02 and 84-03 Personnel Access Ports. Three documents were withdrawn including: 43-Wet collectors for dry product, 55–Boot Seal Valves, 66-Caged Ball Valves.

Two additional documents are awaiting consensus body ballot including: 610- Crossflow Membranes, 29-03 Air Eliminators. It was noted that the number of standards approved in 2007 is actually lower than what was reported under the old approval system in years past. Possible reasons for this were discussed. This led to a general discussion regarding the consensus approval system and the role of CSP in 3-A and in IAFP (see below).

2007 Symposium Proposal: Schmidt reported that the 2007 Symposium proposal on sanitary design and sanitation of tankers (developed by Schmidt and DeLisi) had been rejected by the program committee (PC). He noted that PC had made strong suggestions that it should be broadened to include other commodities (such as fresh produce), and noted that he had considerable problems identifying speakers in these areas. Perhaps, the reason for the rejection was that it was viewed as incomplete.

New Business: 3-A Sanitary Standards, Inc. (3-A SSI): Schmidt reported on the user group survey that has been conducted on behalf of 3-A SSI. The intent of the survey was to determine the perceived value of 3-A standards by the dairy and food processing industry. Data from this survey are currently under evaluation and will be used to develop a marketing plan for 3-A SSI. It was further reported that a survey of the regulatory community is being contemplated. Sims agreed to bring this up for input on the next CSP conference call to provide information of important issues and topics for such a survey.

CSP Membership Issues: The declining membership by state regulatory personnel in CSP and the standards writing process was discussed. Regulatory sanitarians have expressed concerns of being spread too thin in working groups. It was suggested that possible reasons for declining participation are complexly related to budgetary constraints and lack of support by state regulatory administrators. The importance of buy-in by these state regulatory administrators was discussed. It was suggested that a 3-A survey, if done, should target this stakeholder group. As a solution to the low participation by CSP in standards writing, the 3-A Steering Committee Chairperson has suggested that, perhaps, CSP could be broadened in membership to include industry quality control personnel. This concept was discussed at great length, and there was a strong indication that the sanitarians active in the 3-A standards writing process should be regulatory sanitarians.

Role of CSP: Finally, the role of CSP in IAFP and how it can be enhanced was further 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. Board member Lewandowski suggested that, perhaps, this group should develop Webinars and other projects. Sayler suggested that a power point packet could be developed on 3-A and sanitary design to be used by IAFP affiliates at their meetings. Schmidt appointed a committee to look into this.

Symposium for the 2008 IAFP Meeting: It was decided that CSP would re-think and re-submit a symposium on Tanker Sanitation for the 2008 meeting and to seek collaboration with the Dairy Quality and Safety PDG.

IAFP White Paper and/or Position Statement on the Risks of Raw Milk Consumption: Schmidt reported that the Dairy Quality and Safety PDG had decided at the 2006 meeting to develop a position statement on Milk Pasteurization and the Risks of Raw Milk Consumption. Schmidt and P. Michael Davidson, UT, have finished a draft of this paper. Schmidt reported that he would be presenting it to Dairy Quality and Safety PDG at their meeting.

Recommendations to Executive Board:

1. 3-A CSP supports and endorses the white paper on raw milk written by Dairy Quality and Safety PDG and further, to request that the IAFP Board accept it as an IAFP Position on the topic.
2. The committee further asks for continued board support in all things great and small.

Schmidt would give a report at the Committee Chairs' Breakfast.

Next Meeting Dates: The CSP will meet via monthly conference calls, at the 2008 3-A Sanitary Standards meeting, Milwaukee, WI, and at the IAFP 2008, Columbus, OH.

Meeting Adjourned: 11:52 a.m.

Acting Chairperson: Ronald Schmidt.

Audiovisual Library Committee

Members Present: Judy Harrison, Warren Clark, Bob Sanders, Dorothy Wrigley and Xiangwu Nou.

Staff Present: Lisa Hovey and Leilani McDonald.

Meeting Called to Order: 1:10 p.m.

Recording Secretary of Minutes: Judy Harrison.

Old Business: Minutes from the previous meeting were reviewed. During the year, an announcement was sent out on the IFT listserv to ask people to let us know about materials to include in the IAFP Audiovisual Library. No responses were obtained. Only three new acquisitions were added this year. The budget was increased by $500 last year. This money was added to the postage and shipping category. Lani will check to see if Nancy was able to archive resources that had not been requested for three years before she left in October.

New Business: The committee would like to find out if the DVD format is more popular than videos. We requested that a column be added to the Usage Report for next year that shows the format of the resource (video, DVD, etc.) Lisa Hovey mentioned that the videos hold up much better than DVDs. She also mentioned that some people still join IAFP because of the AV Library. The IAFP staff will look into developing a short survey that can be sent by email to people who have used the library in the past but are not currently using it to see why they have stopped. The survey could be sent to others to determine how the library could be more useful to members. The committee requested that next year's budget page show us actual expenditures for the year, as well as the budget for the coming year. Lani will e-mail this information to the committee for the 2006-2007 budget year. Four resources were reviewed this year. Although a negative comment was noted, the committee examined the number of times the resource was requested and decided to leave it in the library unless additional negative comments were received. There was a suggestion that the IAFP staff look into a way to make Powerpoint presentations that members are willing to share for training purposes available via the Web.

Recommendations to Executive Board: None.

Next Meeting Date: August 3, 2008.

Chairperson: Judy A. Harrison.

Committee on Control of Foodborne Illness

Members Present: Ewen Todd (Chairperson), Judy Greig, Christopher Griffith, Jack Guzewich, Elizabeth Hillyer, Sophia Kathariou, Barry Michaels, Maria Nazarowec-White, Thilde Peterson and Agnes Tan.

New Members Present: Jim Knighton, Sherri McGarry and Caroline Smith DeWaal.

Visitors Present: Richard Sprenger, Tom Schwarz and David Park.

Meeting Called to Order: 8:05 a.m.

Recording Secretary of Minutes: Judy D. Greig.

Old Business:

1. Symposia for 2007 discussed and preparations completed. The description of the "mystery event" was given by Thilde Peterson and the role of the Committee as welcomers and thankers. An assessment of the event will be available after Tuesday. Committee members were involved in four other symposia or roundtables.
2. A new revision of the 1999 5th edition of the *Procedures to Investigation of Foodborne Illness* manual was published. However, a new edition will be prepared by the Sub-committee led by Jack Guzewich, Agnes Tan and Sherri McGarry to review other documents and decide what changes are needed. A link with the WHO manual should be pursued and evaluated.
3. Three food worker papers will be published in the July, August and September issues of *JFP*. Two more food worker papers on hygiene and control are in progress — manuscripts to be completed by the end of 2008. Current authors: Ewen Todd, Judy Greig, Barry Michaels and Bert Bartleson.
4. There were 200 attendees in the interactive mystery sessions with very positive feedback.

New Business: Symposia for 2008:

1. Interactive round table on decision-making leading to attribution and food recall when there is limited information.
2. A sequel to the "mystery outbreak".
3. Ecological issues and food safety: leaving a small footprint on the table.
4. Issues with food service management and the spread of infectious disease (with Virus and Parasite PDG).
5. Imported foods – what are the risks?
6. Minimizing risk through corporate culture.
7. Detection and managing food contamination – some new and debatable issues (with Retail PDG).
8. Effects of climate change on food safety and security.

The listserve and conference calls will be continued in 2008 as required.

Recommendations to Executive Board:

1. We recommend that the 6th edition of the *Procedures to Investigate Foodborne Illness* manual be initiated, including evaluation of other material such as the WHO manual. This would include the use of a combination of audit methods and forensic investigations.
2. We seek input on revision of other manuals (water, vectorborne and HACCP) or new areas that the Board has thoughts about. One thought was a guidance document for the retail trade.
3. The committee wants to explore management culture affecting food safety.
4. The committee wants to explore the link between traceability and surveillance to reduce foodborne illness.

Next Meeting Date: August 3-6, 2008 and throughout the year.

Meeting Adjourned: 9:50 p.m. on July 10, 2007.

Chairperson: Ewen Todd.

Constitution and Bylaws Committee

Members Present: Randy Daggs, Steve Murphy, Michael Brodsky and Bob Sanders.

Board and Staff Present: Lee-Ann Jaykus and David Tharp.

Visitors Present: David Fry.

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

Recording Secretary of Minutes: Steve Murphy.

Old Business: 2006 Minutes were presented. Michael Brodsky made a motion to approve them as written, which was seconded by Bob Sanders. They were approved unanimously.

New Business: Long-term members of the committee, Charlie Price and Ron Case, resigned from the committee prior to the annual meeting. David Fry resigned from the committee last year. The committee members acknowledged their long time service to the committee and expressed appreciation for their years of dedication. The committee discussed that new members were needed and reviewed the process of doing so. The current Bylaws indicate that appointments are for 2-year, renewable terms that may be renewed indefinitely. David Tharp clarified the renewal process. New members to recommend for appointment were discussed. The following individuals were recommended: Ann Draughon, Jenny Scott, Kathy Glass, Paul Hall and Bob Gravani.

Recommendations to Executive Board:

1. The committee recommends the following new members for the C&B Committee: Ann Draughon, Jenny Scott, Kathy Glass, Paul Hall and Bob Gravani.
2. The committee recommends that current Chair Randy Daggs and Vice Chair Steve Murphy be reappointed.

Next Meeting Date: August 3, 2008.

Meeting Adjourned: 11:56 a.m.

Chairperson: Randy Daggs.

Foundation Fund Committee

Members Present: Gale Prince, Don Zink, Gary Acuff, Stan Bailey, Roger Cook, Bob Gravani, Bob Marshall, Susan Sumner, Fred Weber, Wilbur Feagan and Paul Hall.

Visitors Present: Jenny Scott and Ed Donnell.

Board and Staff Present: Frank Yiannas, Jeff Farber, David Tharp and Lisa Hovey.

Meeting Called to Order: 3:07 p.m.

Recording Secretary of Minutes: Don Zink.

Old Business: The committee approved the minutes from the last meeting after changing the spelling of one word. Discussed was the outcome of the breakfast meeting in Calgary and the need to find unique ways to recognize major contributors to the Foundation Fund that would not be confused with IAFP Sustaining Member supporter recognition. Also, discussed was the need for training in how to approach and develop major corporate donors. A "Recognition Sub-Committee" was established with Paul Hall, Roger Cook and Fred Weber volunteering to participate. Bob Gravani will facilitate a conference call with a former Cornell University development fund representative to explore ways that we might get training in developing donors.

New Business: The Foundation Fund balance is approximately $593,000 and the fund enjoyed a good return (14%) on investments last year. ConAgra donated $150,000 to the Foundation Fund. Individual contributions are up significantly. Affiliates have contributed over $13,500 in the past 5 years.

The committee asked IAFP staff to develop a detailed financial report with 3-year history and 3-year projections by October 15 of 2007. The committee will meet by conference call to consider this information and plan future spending and fundraising activities.

The committee agreed to ask the lending library committee to provide a 2 to 3 year plan for upgrading the collection from outdated VHS formats to DVD formats.

Recommendations to Executive Board: None.

Next Meeting Date: To Be Determined.

Meeting Adjourned: 4:35 p.m.

Chairperson: Gale Prince.

Membership Committee

Members Present: Susan McKnight, John Bruhn, Leon Gorris, Jenny Scott and Edward Wellmeyer.

Board and Staff Present: Gary Acuff, Vickie Lewandowski and Lisa Hovey.

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

Recording Secretary of Minutes: Susan McKnight.

Old Business: Gordon Hayburn was to be the new chair but was unable to attend. Susan McKnight agreed to continue as chair for an additional year.

New Business: Lisa Hovey (IAFP staff) started our discussion with a few remarks by reviewing a memo she wrote the committee. Highlights mentioned:

1. Membership is approximately 3,200, the highest it has been in the last ten years. IAFP feels the dues restructuring is the driving force behind this current growth.
2. Industry makes up more than half of the current membership and is more than half of the members who did not renew.
3. Most of the reasons given for not renewing were mainly circumstantial (changed jobs, retired, funds are tight, etc.), and very little dissatisfaction with IAFP as an organization.
4. Only 35% of IAFP membership attended the IAFP 2006 conference in Calgary, so it was reasoned that membership in IAFP goes beyond attending the Annual Meeting.

It was noted by John Bruhn that not having a poster or symposia accepted could turn off a member from not renewing and gave a few examples.

A discussion then ensued regarding the negative aspect of lowering the dues structure to gain more members — IAFP gets less money. More members are needed to counter the impact of changing the dues structure. One suggestion was to consider broadening IAFP from food safety mainly involving microbiology to include more toxicology food science.

IAFP moved from its focus of dairy and sanitation to food protection, with a focus on microbials. A suggestion for expanding the dialogue to include more applied science in symposiums was made. Vickie observed, as past program chair, that the Annual Meeting program is shaped by the proposals submitted and is out of the hands of the committee. A suggestion was made about having more outreach to toxicologists and DVMs because of their works' impact on food safety at the farm level. Supply chain issues rule the media today, but it would take a collaboration of the PDGs to cover. Working more with IFT's toxicology group could be explored. It was agreed by those present that IAFP as an organization that enjoys high credibility and is best loved by its members for the cutting edge information presented at conference and the networking opportunities (it is not too big).

Suggestions such as a membership drive, an outreach effort by IAFP members to bring in other food safety professionals in their region, and the international conference were all good avenues to grow the IAFP.

Recommendations to Executive Board

1. The membership committee wants to make some recommendations to the Board to consider whether to develop a strategy:
   - To retain members (lowering dues was a good step).
   - Attract more students to attend and join IAFP as growth for the future IAFP Members after graduation (perhaps more pro-active mentoring of students).
   - Broadening international members such as working more closely with international groups as the Society for Microbiology.

The Membership Committee is asking for guidance from the Board in these areas and if there is a strategy, what role should the committee play.

2. The Membership Committee would like the Board to consider whether a conscious effort should be made to broaden the scope of the IAFP's focus in food safety to other non-microbial areas of food protection and food quality. Outreach activities to garner more involvement from food toxicology, DVMs and applied science could serve as starting points to broaden the IAFP Membership base.
3. The committee would like to draft a questionnaire for board approval for the IAFP International Members and non-members attending annual meetings. Leon Gorris, Susan McKnight and Lisa Hovey will make a 2nd draft, circulate it to Jenny Scott and John Bruhn and then submit it to the Board for approval to email to this community.

Next Meeting Date: A conference call in the fall of 2007.

Meeting Adjourned: 4:00 p.m.

Chairperson: Susan McKnight.

Nominating Committee

Meeting Called to Order: 3:41 p.m.

Recording Secretary of Minutes: Carl Custer.

Old Business: None.

New Business: The Bylaws and the procedures for nomination of the Executive Board Secretary position were reviewed. A list of eligible members was reviewed. The Committee will await nominations from the membership which are due on November 1.

Recommendations to Executive Board: None.

Next Meeting Date: November 2007 Conference Call.

Meeting Adjourned: 4:12 p.m.

Chairperson: Carl Custer.

Past Presidents' Committee

Members Present: Kathy Glass, Jeff Farber, Michael Brodsky, David Fry, Paul Hall, Anna Lammerding, Bob Sanders and Jenny Scott.

Board and Staff Present: Frank Yiannas and David Tharp.

Meeting Called to Order: 3:02 p.m.

Recording Secretary of Minutes: Jeff Farber.

Old Business: None.

New Business:

1. Reports received from Frank Yiannas and David Tharp, IAFP President, on activities of the Association.
2. Discussed Draft "Guidelines for Ethical Conduct" and suggested minor revision for verbiage; will send revisions to the Executive Board for final approval and posting on the IAFP Web site and inclusion on membership materials.
3. Need to verify eligibility of tax deduction for IAFP donations by Canadian citizens to encourage donations to the IAFP Foundation.
4. Consider developing white papers from Rapid Response Symposium.

5. Timing of Past Presidents' meeting needs to be modified to encourage attendance. Recommend moving the time to Saturday 4–5 p.m. before Welcome Reception; Request IAFP staff and Past Presidents' Committee Chair send a message to all committee members 3 months and 2 months in advance so appropriate travel arrangements can be made.
6. Remind Program Chair to communicate with the remaining committee members regarding late-breaking sessions.
7. The Committee recognizes David Fry's attendance at his last IAFP meeting. The Committee thanks David for his many years of outstanding dedication and contributions to IAFP, as well as his good humor and wisdom.
8. Comment that Food Micro will be held in Scotland, Fall 2008; the IAFP European Symposium should consider location/dates to avoid conflicts.

Recommendations to Executive Board:

1. Confirm eligibility of donations to IAFP for tax deduction for Canadian citizens.
2. Consider developing white papers from Rapid Response Symposium.
3. Track new members from meetings (outside annual meeting) as a measure of their impact.
4. Accept Guidelines for Ethical Conduct with minor changes in verbiage.
5. Remind Program Committee Chair to communicate with the remaining committee members regarding late-breaking sessions.
6. Recommend changing the time of the Past Presidents' Committee meeting to Saturday, 4–5 p.m. before the Welcome Reception.

Next Meeting Date: August 2, 2008.

Meeting Adjourned: 4:15 p.m.

Chairperson: Kathleen Glass.

Applied Laboratory Methods PDG

Members Present: Patricia Rule, Pamela Wilger, Ruth Eden, Mary Lou Tortorello, Bassam Annous, Patrice Arbault, Reginald Bennett, Michael Brodsky, Daniel Brown, Jinru Chen, Rocelle Clavero, Sally Foong-Cunningham, Gary Gensler, Jeff Kornacki, Ann Marie McNamara, Molly Mills, Yvonne Salfinger, George Wilson, Nandini Natrajan, Omar Oyarzabal, Vanessa Cranford, Phil Coombs, P.C. Vasavada, Michael Scott, Leslie Thompson and Erdal Tuncan.

New Members Present: Yvonne Chan, Nancy Maragioglio, Douglas Cosby, Peter Olsen, Jingkun Ll, Bruce Bradley, Alessandra Chiareli, Robert Brooks, Charles Young, Sam Sirivicha, Richard Christianson, Brooke Houston, Marcie VanWart, Wendy Maduff, Joshua Gurtler, Thierry Sofia, Y. Jennifer Lee and Xiangwu Nou.

Visitors Present: Larry Beuchat and Jinru Chen.

Board and Staff Present: Stan Bailey and Tamara Ford.

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

Recording Secretaries of Minutes: Pamela Wilger, Nandini Natrajan, Vanessa Cranford and Pat Rule.

Agenda

- Reading of the Antitrust Guidelines.
- Introduction of the new Vice Chairperson and the new Chair of the Discussion Topics/Education series.
- Comments from Stan Bailey.
- Introductions from the attendees.
- Summary of the Wet Workshop held the previous two days.
- Subcommittee updates:
  - Sample Prep Working Group: M.L. Tortorello.
  - Campy Workshop May 2007 at the University of Auburn: Omar Oyarzabal.
  - Web-based discussion group.
- Symposium/Workshop ideas for 2008.
- Ideas for topics for the discussion/education teleconferences.
- Any other old business.
- Any new business.
- Determine next year's calendar for teleconferences.

Old Business:

Vice Chair Nominees: We had two members voice their interest in this position. Since only one can be the Vice Chair, the other one will Chair the Education Series/Hot Topics. We plan to work as a team though throughout the year. Officially, Vanessa Cranford from Walt Disney World is the Vice Chair for 2007–2009 and Nandini Natrajan from Keystone Foods is the Chair of the Education Series/Hot Topics.

Wet Lab Workshop: Pamela Wilger.

Overall it went very well. There was plenty of time for one-on-one working with the vendors and real cultures. We had 9 outside attendees, 4 Central Florida University participants, and 9 vendors. It was a lot of work to put on and together. Vanessa Cranford was the local representative, Veronica Maxwell coordinated the University of Central Florida Lab, Pat Rule and Pamela Wilger worked behind the scenes to make sure everything went smoothly. The only complaint from the participants we heard was the bus ride was too long (90 minutes, due to construction and traffic). It was requested to try to make the workshop either one day or a day and a half in the future. Ann Marie McNamara offered the Silliker Lab in Columbus for next year's IAFP for any wet lab workshops.

Sample Prep Working Group: Mary Lou Tortorello. This was the first face-to-face meeting. There were 19 people in attendance. Lee-Ann Jaykus is the Co-Organizer with Lou Tortorello. The meeting began with 3 presentations. The meeting was all day with a lot of

discussion throughout. There is a need for standardizing sample preparations for quantitative and non-enrichment based analysis. Sampling size and pooling/compositing were discussed but decided to put these topics on hold until a statistician could be present. AOAC documents were used as guides for identifying the commodities. The afternoon consisted of a practical exercise where the group slit into two different groups: Produce and Meat/Poultry. The plan is to write a concept/white paper and publish in *FPT* or *JFP*. The next step is to hold an organizational meeting to identify the key experts on each commodity to develop procedures. Please make recommendations to Lou or Lee-Ann. The ultimate goal is to have an electronic Sampling Compendium.

***Campylobacter* Workshop:** Omar Oyarzabal. There were 18 in attendance. Did not go as well as had hoped, but it was the first one. There were excellent speakers from other countries such as Canada, UK, and South Africa. The workshop needs to expand to 3–4 days from 2.5 days. Would like to add more automation, but would need larger space and 3–4 vendors to supply the automation. It focused on how to isolate Campy from poultry samples. It was extremely hands on. It was questioned if fingerprinting is valuable to include in the future. The PDG said yes, it is very relevant and we need to have sub speciation. Encouraged to plan another one in the future.

Web-based Discussion Group: Facilitated by Julian Cox (not present).

It was agreed that this tool could be very valuable to us, so we will continue as a PDG to try to use it. The problem is no one is adding items or the discussion dies after a few days. Everyone needs to start a topic in it every so often to keep people thinking about it and getting accustomed to using it until it becomes second nature. We will also post the PDG activities on it, including the minutes for the last two years. If you are new or have not signed up for this tool, let Julian know you are interested.

2008 IAFP Applied Methods Program Proposals:

1. The Globalization of Acceptance Criteria for Microbiological Methods: Separating the Science from the Politics organized by Ruth Eden and Michael Brodsky. The PDG felt it needed a Latin American viewpoint also. Alessandra Chiareli will work with Ruth to name the speaker. Ruth will attend the Program Committee meeting Wednesday morning to defend this idea.
2. Sampling and Sample Prep: Unglamorous but Very Necessary organized by Mary Lou Tortorello and Phil Coombs. This is a follow up to the Enrichment Media and Sample Prep Symposium from the Baltimore meeting a few years ago. A roundtable and workshop will be good formats for future years based on follow up from the working group. We should look into the format of technical session and see if this would be better for this topic in the future. Will submit as is written. Lou will attend the Program Committee meeting Wednesday morning to defend this idea.
3. Agreed to submit a joint symposium idea on Testing for Chemical Contaminants in Foods with the Chemical and Food Allergen PDG. T.J. Fu, Pamela Wilger, Patrice Arbault and Peter Olsen helped organize it.
4. Discussed if our PDG should submit a workshop idea this year. Based on the Beverage PDG's plan to submit a wet workshop on molds, we have chosen to resubmit the workshop from this year.

Ideas for topics for the discussion/education teleconferences:

- Complete the *Listeria* topic started in March on ID Confirmation and Enumeration.
- *E. coli* O157:H7 including all other EHEC.
- Sampling Plans (ICMSF) what is Class II or III.
- Turning a lab from paper to electronic. Getting into the ISO atmosphere.
- Identification techniques.
- Validation of methods.

Old Business: None due to lack of time.

Recommendations to the Executive Board:

1. Continued support for yearly teleconference and Web-based presentations to be determined.
2. A one-day meeting room on Saturday at the 2008 IAFP Annual Meeting for purpose of the Sample Prep Working Group meeting to include lunch and refreshments, if possible.
3. Approve Vanessa Cranford as the Vice Chair for 2007–2009.

Next Meeting Date: August 3, 2008 with quarterly conference calls during the year: early November, January, March and May.

Meeting Adjourned: 11:05 a.m.

Chairperson: Pamela Wilger.

Beverage PDG

Members Present: Jeffrey Semanchek, Frank Burns, Ruth Eden, Debi Foti, Kathleen Lawlor, Indaue Mello-Hall, Mangesh Palekar, Mickey Parish, Patricia Rule and Peter Taormina.

Board Member Present: Vickie Lewandowski.

New Members Present: Julie Kuruc, Jan Payne and Theodora Morille-Hinds.

Visitors Present: Malcolm McDonald.

Meeting Called to Order: 2:05 p.m.

Recording Secretary of Minutes: Jeff Semanchek.

Old Business: Summarized the 2007 symposia/ roundtables created by and/or created in conjunction with Beverage PDG.

1. The Management and Control of Chemical Hazards in Food. Monday, July 9, 10:30–12:00 p.m.
2. Mitigating Spoilage Risks in RTD Beverages. Wednesday, July 11, 1:30–3:30 p.m.

Discussed Yeast & Mold workshop originally scheduled for IAFP 2007. Workshop topics and speaker list was finalized but was postponed due to the simultaneous occurrence of competing meetings, as speakers were unable to attend due to emerging issues and resulting conflicts. Discussed and agreed to resubmit workshop for IAFP 2008.

New Business: A Beverage PDG member complimented the Executive Board on the following;

1. Encouraging and exemplifying ongoing meetings to develop program and annual meeting objectives throughout year.
2. Engaging speakers from worldwide scientific community.
3. Including non-microbiological food safety topics such as toxicology in annual meeting program speaker topics.

The Committee nominated and elected Frank Burns as Vice Chair.

Ideas for 2008 meeting symposia, roundtable, and workshops were discussed. The following were agreed upon by the Committee and will be submitted to the Program Committee:

1. CSI Beverage Plant: Case Studies in Yeast & Mold Spoilage. A roundtable designed to allow industry professional to share technical aspects of specific spoilage events, share technical aspects of investigation and success towards solving. Organizers: Frank Burns and Jeff Semanchek.
    1. Yeast & Mold Spoilage in a Cold-filled Beverage.
    2. Yeast & Mold Spoilage in an Aseptic Beverage.
    3. Yeast & Mold Spoilage in a Carbonated Beverage.
    4. Yeast & Mold Spoilage in a Hot-filled Juice Containing Beverage.
    5. Yeast & Mold Spoilage in a Hot-filled Sports Drink.
2. Non-Thermal Process Technologies for Producing Juice Containing Beverages. A roundtable designed to facilitate industry professionals to present various non-thermal technologies towards producing juice containing RTD beverages…a discussion forum for technical aspects for microbial inactivation and limitations. Organizers: Jeff Semanchek, Kathy Lawlor and Jay Shulman.
    1. Pulsed Electric Field.
    2. Ultra Sonic Wave.
    3. UV Light.
    4. Velcorin.
    5. High-pressure Processing.
    6. Micro-filtration.

The Committee Chair proposed a schedule for ongoing meetings between IAFP 2007 & IAFP 2008: Nov. 7, Feb. 6 and May 7. Meeting agenda topics to address, at present:

1. Increasing membership in Beverage PDG.
2. Use of web-based media to communicate information from Beverage PDG.
3. Discussion of emerging beverage industry topics.
4. Discussion of symposia, roundtable, and workshop ideas for IAFP 2009.

Recommendations to Executive Board:

1. Recommend to schedule PDG meetings having similar/overlapping subjects at appropriately separate meeting times to allow attendance by all interested PDG members.
2. Approve Frank Burns as Vice Chair.

Next Meeting Date: November 7, 2007.

Meeting Adjourned: 3:25 p.m.

Chairperson: Jeff Semanchek.

Dairy Quality and Safety PDG

Members Present: Loralyn Ledenbach (Chairperson), Ken Anderson, David Blomquist, Dennis Bogart, Don Breiner, John Bruhn, Warren Clark, Jr., Dan Erickson, Eugene Frey, Dennis Gaalswyk, Kathy Gombas, Donald Lane, Deon Mahoney, Lindsey McDonnell, Steve Murphy, Stephanie Olmsted, Gary Pruitt, Allen Sayler, Ron Schmidt, Joanna Shepherd, Steven Sims, Gaylord Smith, Joseph Smucker, Helene Uhlman and Philip Wolff.

New Members Present: Yvonne Chan, P.C. Vasavada, Caroline Smith Dewaal, Sally Foong-Cunningham and Nancy Eggink.

Board Member Present: Vickie Lewandowski.

Visitors Present: Robert Marshall, Fred Weber, Peter Olsen, Fritz Lembke, Bob Sanders and Dave Park.

Meeting Called to Order: 2:08 p.m.

Recording Secretary of Minutes: Allen Sayler.

Old Business:

1. Check to see if the Dairy Practices Council (DPC) is willing to make available their handbook to IAFP's "Pocket Guide to Dairy Sanitation," via *Food Protection Trends*. The answer is that DPC has all guidelines available and advertised in *FPT* for a price. DPC guidelines will be available on CD by fall. A question was raised as to whether the DPC or the Pocket Guide documents need to be updated. Discussion ensued on this issue.
2. 2007 Program Review – all Dairy PDG program proposals accepted for presentation at this year's meeting.

New Business:

1. 2008 Program Proposals:
    A. Microbiological Sporeformers in Dairy Foods – Source, Survival and Control (Solutions in the Dairy Industry – Practical Solutions). These are what the issues are. David Blomquist, Ecolab,

and Dennis Bogart organizer, with some interest expressed by Tetra Pak rep. from Germany as well. Topics: More and more sporeformers found. Are they survivors of pasteurization or do they originate from recontamination? Need to understand this. Then address state of the art solutions for farms and processing plants. Gram negative buildup – source and cause? Transport tanker cleaning problems – is this contributing to the problem? Survival of pasteurization Speakers: Kathryn Boor, Cornell, need European speaker. Interested volunteers to meet after this meeting to flesh out and finalize proposal.

B. Microbiological Food Safety Hazards Contamination during Transportation of Foods and Food Ingredients. Ron Schmidt described the issues and stated it had been discussed in the CSP meeting this morning. Phil Wolff will agree to assist in development. Steve Sims brought up question of including hauling of non-liquid powders. Ron replied the scope will be limited to liquid transport. Also include the transport in non-metal tanks/containers. National Juice Processor has guidelines on 4 methods for cleaning of tankers. They address microbiological and chemical (allergens).

C. Food Pasteurization Innovations & Regulatory Acceptance. Ron Schmidt introduced the subject. Bactofugation, microfiltration, ohmic heating, high pressure, high pressure CO_2, cold-pulsed electric field, irradiation, etc. Steve Sims discussed NACMCF document on pasteurization and how it is defined. Include specific information on dairy pasteurization. Dennis Gaalswyk stated John Larkin from FDA will be giving a presentation on Wednesday that would set the stage for this topic next year.

D. Better Process Control Workshop for a Formulated Cheese Foods. Lori Ledenbach introduced the subject. "How to" training for cheese and cheese formulated products. Include Steve Spinak, retired FDA LACF head. Other process authorities needed as a speaker. Current LACF school is not attuned to this subject so new training agenda and speakers need to present how the LACF regulation applies to processing of processed cheese. Tanaka curves are used as reference as well as challenge studies. For companies making products should have filed process, but do not have it. Vickie Lewandowski suggested doing this prior to next year's Annual Meeting since this is very time sensitive. Kathy Gombas suggested that this be done in honor of Dr. Tanaka, since he recently passed away. As part of the workshop, have Kathy Glass give an overview of the microbiology. Need to get FDA buy-in so industry taking this workshop would receive credit under the FDA-LACF regulations. Advertise heavily to affiliates and dairy trade associations. Use examples like the pickle industry school for acidified foods as an example.

E. Green Package – Reuse and Recycling of Food Packaging. Allen Sayler introduced the subject. John Bruhn raised the issue of returnable plastic that were used in the past if they passed the sniffer test. Dennis Gaalswyk says a number of plants are reusing virgin plastic jugs. Steve Sims raised issues that in the past caused FDA to prohibit the use of this. George Sadler did much research on this and established that this was low risk. John suggested also addressing energy usage related to this. Steve suggested on food safety aspects of this issue which was supported by the rest of the committee. What about multi-layered packaging. Ron Schmidt wrote a status paper published by IFT on this subject, possibly 10 years ago that should be referenced. Dave Blomquist stated that a processor in the Twin Cities used heavy duty plastic and ended up getting out of it. How many times can recycling occur?

F. Use of Risk Assessment Tools and Application to Dairy Pasteurization – International Perspectives. Introduced by Joanna Shepherd. Write up was completed and submitted. Previously presented, considered and supported at the Microbial Risk Analysis PDG. Want the support of the Dairy PDG. Subjects include: a history pasteurization, available tools to evaluate risk assessment, status of raw milk microbiology, details on what pasteurization actually accomplishes, risk-based control of pathogens in raw milk cheese – a French perspective and new risk-based initiative in the regulation of dairy products.

2. Special Projects. Staff made a brief presentation thanking committee members for their participation and attendance. Vickie Lewandowski made a presentation representing the Board to compliment the Committee, encouraged the PDG to be a working group the entire year through conference calls and to develop pamphlets and publications addressed for use by consumers, food processors. regulators and distributors. She explained various formats for symposia, including roundtable, straight symposia, "seed" one or two questions to get audience going. Vickie encouraged working together with other DPG groups. Expand variety of speakers to include new and more international speakers. John Bruhn encourages expanding beyond microbiological to include more chemical and other food hazards, beyond allergens.

A. Publications – White Paper on Consumption of Raw Milk Paper introduced by Ron Schmidt. The paper was reviewed by the Committee members. One slight change was suggested

by Dennis Gaalswyk and Ron will make the change regarding "majority of states require pasteurization." Recommended that this be adopted by the IAFP Board as an official position. John Bruhn suggested the paper be peer-reviewed. Others (Dennis Bogart and Bob Sanders) questioned whether there was a need for peer review since it is a position paper. There was debate on the need for peer review. Dennis Bogart moved and Steve Sims seconded to recommend the paper to the Board. After further discussion on the need to further review the paper, the motion and second were withdrawn. Moved by Vickie Lewandowski and seconded by John Rushing to have the Committee meet in one month to review and finalize the paper. The Chair will E-mail electronic version to the Committee within the next week. The deadline for comment is August 1 with all comments to be submitted to Ron Schmidt. Dennis Bogart suggested any recommended changes be significant.

B. Pamphlets — DPC Updates on field guides. The PDG to review what is current and see if updates are necessary and/or if new pamphlets need to be developed. These could be included on the PDG Web page.

C. Dairy PDG Web page — The Chair requested input into upgrading the Web site. List pamphlets on Web site and Committee members were requested to provide Web site addresses on dairy subjects that we could add to our Web site. Also include previous Board recommendations for an expert speaker list for state affiliates and a list of dairy trade magazine contacts for advertising potential for IAFP.

D. Current Upcoming Events related to the Dairy Industry — World Wide Food Expo, Chicago — Oct. 24 – 27. The Dairy PDG will schedule a face-to-face meeting there as well as have conference call capabilities. Allen Sayler will check if there is a reduced cost for those Dairy PDG members that may want to attend the show.

E. Dairy PDG encourages Committee members to volunteer for the Program Committee since we have no current representation. Need to write David Tharp indicating interest and include a short bio.

Recommendations to Executive Board:

1. Approve Allen Sayler as PDG Vice Chair, to become Chairperson at the 2009 meeting.

Next Meeting Date: August 1, 2007.

Meeting Adjourned: 4:15 p.m.

Chairperson: Loralyn Ledenbach.

Food Chemical Hazards and Food Allergy PDG

Members Present: Richelle Beverly, T. J. Fu, Cindy Jiang, Linda Leake, Kathleen O'Donnell, Gary Pruitt, Todd Rossow, Peter Slade and Tom Schwartz.

New Members Present: Jo Marie Cook, Leon Gorris, David Kendra, Don Lane and Suely Nakashima.

Board Member Present: Jeff Farber.

Meeting Called to Order: 9:04 a.m.

Recording Secretary of Minutes: Leon Gorris (part I); Peter Slade (part II).

Old Business: The Chair, T.J. Fu, noted that one of the major activities of the PDG is to come up with ideas for symposia to feature in next year's Annual Meeting. She first tabled a number of symposia that had been established by this PDG and others as a trigger for thoughts. A number of topics were suggested in the agenda:

- chemical hazards and allergen testing methods: an update.
- chemical hazards: current issues.
- food allergens: scientific advances and control measures.

Mycotoxins was suggested as a specific topic, where EU regulations are going to apparently be much more stringent than US (e.g. on aflatoxins) and there are other regions in the world that might adopt these more stringent levels ultimately having an impact on trade.

The suggestion was made to focus on topics that allow more in depth discussion.

Suggestions from Jeff Farber, Board Liaison:

- encourage the PDG to consider new and emerging issues in developing symposia.
- encourage the PDG to have regular meetings to discuss issues throughout the year.
- encourage the PDG to develop white papers.
- encourage the PDG to hold webinars for emerging issues.

New Business: It was suggested to propose two new symposia, one on allergens and the other on mycotoxins as follows:

1. Food Allergens (Coordinators: T. J. Fu and Linda Leake).

   Food allergens – current understanding.
   Update on "EuroPreval".
   Effect of processing on food allergens.
   Validation of cleaning methods to prevent cross contact.
   Allergen control – US and international regulatory perspective.
   Overview of allergen control measures – food processors prospective.

2. Mycotoxins (Coordinator: David Kendra).
   Issues.
   Methodology.
   Regulatory environment.
   Global perspective – harmonization, etc.
   Database resources, etc.

It was further decided to prepare a Webinar on chemical contaminants issues, specifically to address issues relating to broadscreen testing for unknown contaminants (e.g. melamine), "rapid alerts for novel chemical hazard issues, the limitations of HACCP-like control programs, etc.

Other noteworthy topics to consider include:
Trace metals in seafood.
Lead in spinach.
Antibiotics and pesticides in honey and the wider impact on fresh fruit impact as a result of bee population decline ("colony collapse").
State versus federal regulatory involvement.
Antibiotics in cultured seafood.

The need for multiplexed antibiotic detection methods was identified.

Other decisions included:

1. Hold regular (quarterly) PDG conference calls.
2. With respect to PDG recruitment and growth, personal approaches rather than mass mailings were suggested (i.e., each existing member to call several potential members). It was agreed that a one-page summary describing the PDG and its activities would be developed to serve as a primer for this activity.
3. Place notices of PDG upcoming events in newsletters/calendars of other organizations (e.g., ACS, AOAC, IFT, etc.).

Recommendations to Executive Board:

1. To provide support and resources for setting up regular PDG conference calls and webinars.
2. IAFP collaborate with other associations (e.g., AOAC, ACS, IFT) to develop symposia/workshops on topics of mutual interests (issues related to chemical contaminants and food allergens).
3. Encourage symposium organizers to include recruitment of international speakers so that a global perspective on food safety issues can be presented.

Next Meeting Date: August 3, 2008.

Meeting Adjourned: 11:01 a.m.

Chairperson: Tong-Jen Fu.

Food Hygiene and Sanitation PDG

Members Present: Zeb Blanton, Dennis Bogart, Ken Davenport, Dale Grinstead, Kenneth Janes, Jennifer Lee, Thomas McCaskey, Chris Remus, Fred Reimers, Peter Snyder and Gloria Swick-Brown.

New Members: Rocelle Clavero, Brian Nummer, Todd Rossow, Kelly Stevens, Allen Sayler and Sharon Wood.

Meeting Called to Order: 1:01 p.m.

Recording Secretary of Minutes: Chris Remus.

Old Business: Minutes from last meeting were approved. There was discussion on why none of last year's submitted symposia were accepted. Lee-Ann Jaykus, Program Committee, indicated that there were 70 submissions and 30 slots. She indicated that the Program Committee is always looking for new topics. Lee-Ann indicated that this committee should also be used as a vehicle for networking and discussion of common issues.

New Business: Todd Rossow was elected as the new Vice Chair of the Food Hygiene and Sanitation Committee. Floor was open and discussion generated four suggested symposia:

1. Exclusion of Ill Food Workers. This is an important issue. Perhaps this topic could be a roundtable discussion with short presentations plus a question and answer session with the audience? Subjects to include: US and Canadian perspective, Legalities, Cultural differences, and Physician education. It was also felt important to have someone represent the food worker. Rocelle Clavero will investigate and coordinate.
2. Hand Hygiene. This topic generated much discussion. An outline for a proposed symposium was generated with these six headings: Gloves – Pros and Cons; Proper Handwashing Technique; Hand Sanitizers – Pros and Cons; Primary Modes of Contamination by Hands; Regulatory Requirements; and Industry Best Practices. Fred Reimers will coordinate.
3. Produce Safety and Sanitation. Dale Grinstead passed out a proposal that he and Bassam Annous developed. The main topics were: Food Safety Risks with Raw Produce; How Pathogens Get into Produce; GAP (Good Agricultural Practices), Direct Intervention Technologies and Sanitary Organic Processing. Depending on other PDG submissions either of these two subjects: Farm Water Quality or Hygiene and Sanitation – Farm to Fork would be presented. Dale Grinstead and Bassam Annous will continue to develop a submission.
4. Simpler Sanitation. Kelly Stevens suggested having a symposium on making sanitation easier and simpler. There was discussion of suitable topics. It was suggested to have this as a half symposium with these three subjects: Simplistic Cleaning; Cleaning RTC (Round the Clock); and Cleaning Process Validation. Kelly will continue to develop.

There was no further discussion. Dale Grinstead closed the meeting.

Recommendations to Executive Board:

1. Approve Todd Rossow as the new Vice Chair.

Next Meeting Date: August 3, 2008.

Meeting Adjourned: 2:23 p.m.

Chairperson: Dale A. Grinstead.

Food Law PDG

Members Present: LeAnn Chuboff, Carl Custer, Anna Lammerding, Dean Mahoney, Jenny Scott, Mickey Parish, James Sasanya, Caroline Smith DeWaal and Ronald Weiss.

New Members Present: Ginny Edleman, Craig Harris, David Kendra and Nancy Maragioglio.

Visitors Present: Janet Beauvais, Jeff Keithline and Suely Nakashima.

Board and Staff Present: Jeff Farber and Didi Loynachan.

Meeting Called to Order: 1:10 p.m.

Recording Secretary of Minutes: Anna Lammerding.

Old Business: Review of the PDG's symposium (Wed., July 11, 8:30 a.m. – 12:00 p.m.): "Preparing Scientists for the Legal Aspects …" This promises to be an innovative and different type of symposium for IAFP, including a mock trial. Organizers and Convenors LeAnn Chuboff and Donna Garren are commended for their efforts in pulling it all together. Discussion held on last year's intention on setting up a networking bulletin board.

New Business: Three activities for the PDG were proposed, discussed and developed: An educational workshop on food law, to target particularly younger members, and those who haven't yet learned through the school of 'hard knocks' the fundamentals of relevant food laws in the US, and also broaden exposure to the same in the countries around the world. Possible collaborations on development and delivery of such a workshop with external organizations will be explored. A symposium/ roundtable on comparative laws (adulteration) is proposed for 2008, with speakers from 4 to 6 regions of the world. Finally a white paper is proposed, intended to spell out the differences between laws, regulations, and policies.

Recommendations to Executive Board:

1. That the IAFP staff establish E-mail subdirectories containing members of specific PDGs that can be accessed by members to connect with their PDG during the year.

Next Meeting Date: August 3, 2008.

Meeting Adjourned: 3:10 p.m.

Chairperson: Anna Lammerding.

Food Safety Education PDG

Members Present: Sandy McCurdy (Chairperson), Renee Boyer, Christine Bruhn, Benjamin Chapman, Jinru Chen, LeAnn Chuboff, Anthony Flood and Amarat (Amy) Simonne.

Visitors Present: Brian Nummer, Marsha Robbins, John Marcy, Edward Mather and Dee Dee Morac.

Board Members Present: Gary Acuff and Stan Bailey.

Meeting Called to Order: 9:05 a.m.

Recording Secretary of Minutes: LeAnn Chuboff.

Old Business: 2006 minutes are posted on the IAFP Web site and were read by Christine Bruhn. A symposium for the 2007 Annual Meeting was developed by Christine Bruhn and Ben Chapman and, after collaborating with other PDGs, evolved to "Measuring and Motivating Safe Food Handling Practices at Home, Retail and Foodservice" (1:30 p.m. to 5:00 p.m., Monday, July 9, 2007). A subcommittee to identify food safety educational resources to post on the IAFP Web site for member use was formed of 8 PDG members.

New Business: Those present introduced themselves. Antitrust guidelines were briefly reviewed.

Potential activities for the PDG were identified, with President-Elect Gary Acuff providing additional information about the PDG activities challenges from IAFP Vice President Stan Bailey. One goal of IAFP is to build international presence; travel assistance is available from IAFP to support international speakers to the Annual Meeting. White papers are needed from all segments. The purpose of the PDGs is to share information. Groups are encouraged to share information throughout the year and if wanted by the group, IAFP will support the groups in their communication efforts. Tony Flood suggested that we build a symposium on International perspectives on food safety. It was suggested that the symposium should include cultural influences on food safety and food defense. International speakers can be costly; sponsors or support from the Association to support travel costs would be needed. It was suggested that speakers include recommendations for future implementation as well as research data. It was noted that roundtables are a new format that works well. A sub-committee to develop a symposium and roundtable proposal was formed (Ben Chapman, Tony Flood, Christine Bruhn, Renee Boyer, LeAnn Chuboff and Sandy McCurdy).

The group discussed development of Web-based food safety resource information for IAFP members to share new and reliable food safety information. It was recognized that this is a large task; several universities extension units have developed or are working on food safety Web sites. Web sites require extensive management to keep them current. Information would be at the level of informed public, not highly technical. Key individuals for various subject matters could be identified to provide specific resources. The issue of sharing member expertise was also raised in the Membership committee meeting. It may be possible to collaborate with the Student PDG on this project. The subcommittee will work on this in the next year with the addition of new members Ben Chapman and Renee Boyer.

The Chairperson position is for 2 years; Sandy McCurdy will continue for another year. Currently there is no vice chairperson; Christine Bruhn volunteered to assist the chair.

Recommendations to Executive Board: None.

Next Meeting Date: August 3, 2008.

Meeting Adjourned: 11:00 a.m.

Chairperson: Sandra McCurdy.

Fruit and Vegetable PDG

Members Present: Suresh Pillai, Alejandro Castillo, Bassam Annous, Larry Beuchat, Shirley Bohm, Nigel Cook, Michelle Danyluk, Sally Foong-Cunningham, James Gorny, Jack Guzewich, Linda Harris, Montserrat Hernandez Iturriaga, Lee-Ann Jackson, Stephen Kenney, Kalmia Kniel, Keith Lampel, Wendy Maduff, William McCullough, Leopoldo Orozco Ramirez, Franco Pagotto, Jena Roberts, Manan Sharma, Amarat Simonne, Peter Slade and Pamela Wilger.

New Members Present: Francisco Diez, Ritchie Ridall, Karl Matthews, Elliot Ryser, Xiangwu Nou, Stephen Grove, Bill Schwartz, Elizabeth Bihn, Sherri McGarry, Caroline Smith DeWaal, Barry Eisenberg, Carol D'Lima, Jim Knighton, Jeff Semanchek, Mangesh Palekar, Valerie Bohaychuk, Yuhuan Chen and Kristen Matak.

Visitors Present: Marsha Robbins, Todd Bacon and Cesar Bin Kingombe.

Meeting Called to Order: 1:04 p.m.

Recording Secretary of Minutes: Alex Castillo.

Old Business: None.

New Business:

1. There was a brief introduction of the attendees who were present.
2. There was an update of the produce-related outbreaks from the FDA perspective by Jack Guzewich.
3. There was an update on the response taken by the produce industry in California in terms of the marketing agreement signed by multiple agencies and producer groups in California by Jim Gorny. Jim provided an overview of the microbial testing metrics. There was some discussion about the relevancy of the metrics and how they were formulated.
4. Linda Harris provided an overview of the Center focused on Fresh Produce Safety at UC Davis. She explained the goals of the Center and the on-going search for an Executive Director.
5. The attendees provided a brief overview of their respective outreach/research programs and industry functions. There was some follow-up discussion based on what was mentioned.
6. The Fruit and Vegetable PDG decided to partner with the Water Quality PDG and the Food Hygiene and Sanitation PDG for developing joint symposia. The Fruit and Vegetable PDG has also decided to submit a topic on the produce safety metrics for a roundtable discussion.
7. Alex Castillo mentioned that he was interested in developing a Latin American Produce Safety Workshop since the last such workshop was held almost 8 years ago.

Recommendations to Executive Board: None.

Next Meeting Date: August 3, 2008.

Meeting Adjourned: 3:04 p.m.

Chairperson: Suresh Pillai.

Meat and Poultry Safety and Quality PDG

Members Present: Dan McElroy, Jeff Kornacki, Tim Dambaugh, Roger Cook, Ian Jenson, Tineke Jones, Lynn McMullen, Dennis Burson, Timothy Freier, Wafa Birbari, Kathy Glass, Veny Gapud, Thomas McCaskey, Cindy Michalski, Justin Ransom, Eric Line, Margaret Burton, Robert Brooks, Harshavardhan Thippareddi, Wendy Wade, Nandini Natrajan, Linda Leake, Mark Pratt, John Wendell, Todd Bacon, Suely Nakashima, Randy Huffman and Margaret Hardin.

New Members Present: Theodora Morille-Hinds, John Marcy, Ann Marie McNamara, Patricia Wester, Jason Richardson, Michael DeLaZerda, Joshua Gurtler, Ken Kenyon, Amanda Lathrop, Elisa Cabrera-Diaz, Alfred Fain, Gregory Brun, Sophia Kathariou, Douglas Cosby, Lisa Mina and Jeffrey Rhodehamel.

Visitors Present: DeAnn Benesh, David Rasmussen and Dane Bernard.

Board Member Present: Lee-Ann Jaykus.

Meeting Called to Order: 2:10 p.m.

Recording Secretary of Minutes: Lisa Mina.

Old Business: Thanks to Margaret Hardin for her committee service. Gave a reminder of two 2007 symposia:

1. S3 Food Defense Research and Application – Monday July 9, 8:30 a.m.–12:00 p.m., Grand Republic B, Organizer: Lynda Collins Kelley.
   Convenors: Lynda Collins Kelley and Margaret D. Hardin.
2. S21 Spoilage and Its Control in Meat Products – Wednesday July 11, 1:30 p.m. – 3:30 p.m., Grand Republic B, Organizers: Lynn McMullen and Peter Bodnaruk.
   Convenors: Lynn McMullen and Peter Bodnaruk.

New Business: Board Member Lee-Ann Jaykus spoke to the group. She announced her new board status and shared new IAFP communication resources; Webinar, teleconferences & List server.

Call for 2008 Symposia topics:

1. Overview of international controls for campy intervention: on farm, off farm, consumer – what is being done now and what is working. Lead: Roger Cook, NZ Beef and Lamb (need to confirm lead – could be John Marcie, Univ. of Arkansas).

2. Imports: How to conduct appropriate analysis and risk reporting – examination of traceability, gap analysis, – could work well as a roundtable. Lead: Wafa Birbari. Support: Trish Wester.
3. Is It Overdone? A symposium on theoretical risks associated with formation of potentially carcinogenic compounds in meat and their relationship to food safety – a look at HCAs, nitrite and interpreting epi risk. Leads: Randy Huffman and Lisa Mina.
4. *Salmonella*: From Farm to Fork – what works from transport – slaughter – consumer. Lead: Jeff Kornacki. Support: Harshavardhan Thippareddi.

   Overall a symposium should be unique, innovative and demonstrate applicability.

Other Business:

1. Proposal that meetings have more "value add" to members.
2. Next year there should be a brainstorm session on symposia ideas 1 month prior to the Annual Meeting. At the meeting, the ideas should be more flushed out and in-depth.
3. New Vice Chair elected: Tim Freier, Cargill.

Recommendations to Executive Board:

1. Recommend that time be allotted for late-breaking topic.
2. Communicate activity on late-breaking topics as early as possible.
3. Approve election of Tim Freier as Vice Chair.

Next Meeting Date: August 3, 2008.

Meeting Adjourned: 3:30 p.m.

Chairperson: Dan McElroy.

Microbial Risk Assessment PDG

Members Present: Mickey Parish, Michelle Danyluk, Leon Gorris, Richard Whiting, Agnes Tan, Yuhan Chen, Don Schaffner, Patricia Desmarchelier, Jenny Scott, Jerry Erdmann, Montserrat Hernandez Iturriaga, Joanna Shepherd, Fumiko Kasuga, Ewen Todd and Deon Mahoney.

New Members Present: Richard Brouillette, Ken Janes, Wendy Wade, Roger Cook, Janet Beauvais, Jim Knighton, Ian Jenson, Fur-chi Chen, Leopold Orozco and Charles Gerba.

Board Member Present: Jeff Farber.

Meeting Called to Order: 10:13 a.m.

Recording Secretary of Minutes: Michelle Danyluk.

Old Business: Mickey Parish welcomed all members and all members present were introduced. Don Schaffner and Yuhan Chen gave an update of the pre-meeting workshops, where 25 attendees, four instructors and one guest speaker were present. The workshop went very well and the PDG will consider hosting a similar workshop again in two years. Jeff Farber, representing the Board, encouraged the development of more and unique symposium and roundtables, and the possibility of sponsoring Webinars. Mikey Parish reminded the PDG of their symposium on Monday afternoon, and other applicable seminars.

The 2006 minutes were approved with no modifications.

New Business: Developments of note including, WHO/FAO activities and upcoming events (IAFP Europe, SRA 3rd international conference on MRA, 5th Microbial Modeling in Greece Sept. 16–19) were discussed.

Also listed were useful web resources, including FoodRisk.org, COST 920, ComBase and Predictive Microbiology Growth Models and Data Database.

Three potential symposium topics were agreed upon for further development, including: 1) Roundtable on data sharing (Tanya Roberts), 2) Update of how risk management and risk assessment are used worldwide, and 3) JIFSAN to sponsor as ILSI does.

Joanna Shepherd also mentioned a symposium being submitted with Dairy on "If pasteurization of milk is necessary in today's risk based society". Other ideas for next year included a possible workshop (Ewen Todd) on managing your system through RA/modeling/profiling, or how to interpret different styles of RA.

Jeff Farber expressed the desire for PDGs to develop white papers for the board's consideration. Leon Gorris expressed a need for more PDG involvement in the planning of programs for the International meetings.

Recommendations to Executive Board: None.

Next Meeting Date: August 3, 2008.

Meeting Adjourned: 10:50 a.m.

Chairperson: Mickey Parish.

Retail Food Safety and Quality PDG

Members Present: Alfred Fain, Veneranda Gapud, Richelle Beverly, Shirley Bohm, Sid Camp, Jinru Chen, Carl Custer, Thomas Ford, Donna Garren, Toni Hofer, Stephen Kenney, Thomas McCaskey, William McCullough, Debby Newslow, Charles Papa, Fred Reimers, Todd Rossow, Mary Sandford, Thomas Schwarz, Amarat Simonne, Peter Snyder and Gloria Swick-Brown.

New Members Present: Brian Nummer, Mangesh Palekar, Eric Martin, Petra Hochmuth, Allen Sayler, Tom Zierenberg, Caroline Smith DeWaal, Kathleen Rajkowski, Craig Harris, Anne Marie McNamara, Le Ann Chuboff, John Marcy, Amanda Lathrop, Sharon Wood and Paul Marra.

Visitors Present: Jack Guzewich, Marsha Robbins and Steve Sikes.

Board Member Present: Frank Yiannas.

Meeting Called to Order: 10:05 a.m.

Recording Secretary of Minutes: Veny Gapud
Old Business: Chairperson Al Fain reviewed the PDG Mission Statement and read the IAFP Anti-trust Guidelines to the attendees. The individuals present were asked to state their name and affiliation. He also announced the Retail PDG – sponsored symposia for 2007: Session RT1 Using HACCP to Innovate New Processes in Retail Food Operations. Organized and convened by Peter Snyder with Vijay Juneja as Co-convenor. Monday, 8:30 a.m., Nutcracker 3. Jointly sponsored with the Food Hygiene and Sanitation PDG.

Board Liaison Frank Yiannas reported briefly on the state of the IAFP, stating that the organization is strong and growing with a 10 percent increase in membership. Donna Garren of NRA announced upcoming meetings on business continuity as well as Viruses Impacting Restaurants and Foodservice Industry.

New Business: Symposium topics for 2008 had been solicited by e-mail in June 2007. The following symposium topics were discussed and will be prepared for submission to the Program Committee for consideration:

1. Pete Snyder will submit a proposal for an annual symposium reviewing recent retail food safety issues and addressing new food processes, update of new food products, regulatory issues, and improvements in HACCP-based Food Safety Management Systems. This symposium will be developed with joint sponsorship with other product or process-oriented PDGs.
2. Veny Gapud will submit a proposal for a symposium addressing food safety issues in food distribution systems. The symposium will be entitled "How Did It Get There Safely?"

The group discussed development of pamphlets, white papers and webcasts as tools for communication. Pete Snyder will chair a sub-committee to develop a white paper based on the symposium topic listed above.

Ann Marie McNamara was elected by acclamation to fill the position of Vice Chairperson of the Retail PDG, beginning at the 2008 IAFP Annual Meeting in Columbus, Ohio. Veny Gapud will assume the Chairperson position for the next two annual meetings (beginning at IAFP 2008).

Recommendations to Executive Board:

1. The Retail Food Safety and Quality PDG recommends that the Executive Board continue its efforts to reduce the overlapping of PDG meeting schedules. The PDG recommends that meetings be reduced to an hour and a half to facilitate scheduling.
2. Approve the election of Ann Marie McNamara as Vice Chairperson to begin term at IAFP 2008 in Columbus, Ohio.

Next Meeting Date: August 3, 2008.

Meeting Adjourned: 11:20 a.m.

Chairperson: Alfred R. Fain, Jr.

Seafood Safety and Quality PDG

Members Present: Richelle Beverly, Stephenie Drake, Douglas Marshall, Marlene Janes, Peter Hibbard, Alfred Fain, Lorraine McIntyre, Kathleen Rajkowski and Yi-Cheng Su.

New Members Present: Matthew Turner, Maria Sanchez, Lawrence Goodridge, Amanda Lathrop and Chengchu Liu.

Board Member Present: Vicki Lewandowski.

Meeting Called to Order: 1:10 p.m.

Recording Secretary of Minutes: Stephenie Drake.

Old Business:

1. Election of Vice Chairperson. Kathleen Rajkowski was elected.
2. Minutes approved Doug Marshall moved and Peter Hibbard seconded.
3. Marlene Janes read the anti-trust guidelines.
4. Vicki Lewandowski reminded the Seafood PDG members that the Professional Development Groups were formed as a means of networking with other scientists with similar interests. Furthermore, she recommended we develop other ideas for getting information across such as development of booklets or guidelines to be used by industry or consumers. Potential new methods to present research would be short symposium programs or roundtables, and applied topics.

New Business:

Symposiums ideas:

1. Kathleen Rajkowski submitted one symposium and one roundtable for consideration by the Seafood PDG.

   Roundtable: Consumer aspect with cooking in the home to reduce microbes in shellfish, finfish, shrimp and lobster.

   Symposium: Finfish safety: "From Fish to Table." This symposium would cover the following issues:

   Farming for safety, harvesting and filleting, shipping and temperature abuse, safety at retail, and consumer concerns. Action: The Seafood group supported the Finfish symposium.

2. Peter Hibbard presented a symposium developed by Michael Roberson for consideration by the Seafood PDG: "Food Safety Control Strategies: *Vibrio* and Raw Oysters: Food Safety Control Strategies in Oysters with *Vibrio*." This symposium would cover the following issues: *Vibrio* diseases surveillance and trending, harvesting and manufacturing control strategies, retail control strategies, consumer advisory strategies, and public-private partnerships to reduce *Vibrio* infections. Action: The Seafood PDG thought it was too similar to this year's symposium.
3. Short Symposium to be developed by Lorraine McIntyre and Lawrence Goodridge: "Seafood Safety A to Z: Pathogens, amines and mercury." This symposium would cover the following issues: Virulence profiles in west and east coast isolates of *Vibrio parahaemolyticus*, the science of biogenic amines, heavy metal, antibiotic and chemical residues in seafood.
4. Roundtable to be developed by Doug Marshall and Peter Hibbard: "Seafood sustainablity and safety implications." Geographic shifts.

Discussions: Lorraine McIntyre brought up the concerns about catfish imported from China with regards to toxins and ungutted fish sold to consumers by Indians. The PDG had a short discussion about these issues.

Also discussed was what groups we wanted to get information out to about seafood safety such as consumers and retail. How do we get this information to them? Some of the ideas included an online talk or Broadcast! Next year the Seafood PDG would like to have one of their presentations presented live online through a web cam directed at consumers. In addition, Larry Goodridge, Richelle Beverly and Marlene Janes will launch a Web site for the Seafood PDG that will have links to other Web sites for consumer and retail food safety.

Recommendations to Executive Board:

1. Scatter the meeting times for the PDGs.
2. Approve the election of Kathleen Rajkowski as Vice Chairperson.

Next Meeting Date: August 3, 2008.

Meeting Adjourned: 2:50 p.m.

Chairperson: Marlene Janes.

Student PDG

Members Present: Richelle Beverly, Stephenie Drake, Wendy Maduff, Karla Mendoza, Linda Leake, Jennifer Cascarino, Hudaa Neetoo, Catie Simpson, Jacquelyn Miles, Courtney Rheinhart, Brooke Whitney, Yvonne Chan, Benjamin Chapman, Michelle Danyluk, Viviana Fino, Ivan Nastasijevic and Laura Bauermeister.

New Members Present: Rebecca Goulter, Silvia Dominguez, Bradley Olson, Soo Yeon Oh, Kirsten Hirneisen, Sacha Derevianko, Raviraj Jadeja, Feifei Han, Luciano Chi, Christina Dock, Douglas Cosby, Carolina Naar, Nancy Acosta, Dayna Swiatek, Reshani Senevirathne, Sajida Plauche, Amnish Chawla, Deborah James, Rebecca Robbins, Stephanie Chiu, Su-sen Chang, Pei-Chun Chen, Carolina Fey, Christiane Soares, Patricia Jacob and Karabo Shale.

Visitors Present: Kelsey Dickenson, Wendy Lu, Scott Burnett, Kalmia Kniel and Manan Sharma.

Board and Staff Members Present: Frank Yiannas, Lee-Ann Jaykus, Jeffrey Farber, David Tharp, Lisa Hovey and Tamara Ford.

Meeting Called to Order: 12:00 p.m.

Recording Secretary of Minutes: Catherine Simpson.

Old Business: Introduction of outgoing executive committee members by Brooke Whitney.

New Business: Introduction of new executive student board members (Whitney). Presentation (Whitney, Ben Chapman) of student agenda and organized activities for IAFP 2007, which include student-industry personnel networking program, student-student networking opportunities (e.g., student mixer, IAFP scavenger hunt).

Guest Speaker: Dr. Lee-Ann Jaykus presented "Writing an Abstract". Included handouts, brief discussion of standardized abstract format for IAFP, generalized advice regarding the composition of successful abstracts and proceedings papers.

Dismissal of non-student members and students with previous commitments.

1:20 p.m.: Group discussion of symposia topics. The following topic ideas were presented to the group:

1. Pre-harvest food safety.
2. Predictive microbiology.
3. Process hygiene.
4. How to react to an outbreak.
5. Innovative and emerging non-thermal processing technologies.
6. Quantitative risk assessment.
7. Emerging and re-emerging foodborne pathogens.
8. Imported foods.
9. Antimicrobial resistance.

The following ideas were selected (and modified as needed by breakout groups) as potential symposia topics; subtopics and potential speakers were then addressed:

1. Pre-harvest food safety.
2. How to react to an outbreak.
3. Imported foods.

Recommendations to Executive Board: None.

Next Meeting Date: August 3, 2008.

Meeting Adjourned: 2:55 p.m.

Chairperson: Brooke Whitney.

Viral and Parasitic Foodborne Disease PDG

Members Present: Doris D'Souza (Chairperson), Sabah Bidawid, Nigel Cook, Jack Guzewich, Julie Jean, Tineke Jones, Kalmia Kniel, Melvin Kramer, Lorraine McIntyre, Franco Pagotto, Adrian Parton and Suresh Pillai.

New Members Present: Dayna Swiatek, Stephen Grove, Maria Sanchez, Viviana Fino, Kirsten Hirneisen, Jennifer Cascarino, Alexandra Derevianko and Charles Gerba.

Visitors Present: Janet Beauvais, Vincent Atrache and Antoine Vimont.

Board and Staff Members Present: Lee-Ann Jaykus and Donna Bahun.

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

Recording Secretary of Minutes: Lorraine McIntyre.

Old Business: Lee-Ann Jaykus (Board Liaison) addressed the issue that the PDG did not have any symposium this year and encouraged the PDG to submit symposia topics with new and creative ideas of scientific merit, and that were timely with a mix of international speakers and topics. She also discussed that IAFP would help facilitate conference calls, Webinars, booklets and fliers as necessary for use by the PDG in encouraging and maintaining membership.

New Business: Sabah Bidawid updated the group on the FEVN (official mark in 2005 as a platform to bring scientists together from North America) that has now been accepted as part of the ENVIRONET. The Web site for FEVN is under construction and membership to FEVN is currently free. He also discussed a project developing between Canada, Spain, the Netherlands, New Zealand and France on the validation of microarrays for noroviruses. Nigel Cook gave a brief review on ENVIRONET (European Virology Network) and looks forward to the involvement with the US (Jan Vinje, CDC) and New Zealand (Gail Greening). More information is available at their Web site: www.cost929-environet.org. They also aim at proactive systems to reduce viral contamination.

One roundtable symposium topic was suggested and discussed entitled "Issues involving retail food management in restaurants and vessels." There were discussions regarding dealing with the vomiting issue in food establishments and service areas, issues about employee sick leave policy in food establishments during illness, epidemiology and the food safety issues, which could make good roundtable discussion topics. These could be linked to the retail food safety PDG and/or the control of foodborne illness group regarding cosponsoring this roundtable discussion. Melvin Kramer could organize this roundtable symposium. Doris D'Souza submitted this roundtable discussion topic on behalf of the PDG to the Committee on Control of Foodborne Illness (Ewen Todd) for co-sponsorship.

Full symposia topics were also discussed. Many ideas were suggested such as human epidemiology and transmission of noroviruses for e.g. in prepackaged meats (Lee-Ann Jaykus); detection methods involving the cell culture systems for human noroviruses (Suresh Pillai/Gerba); norovirus surrogates (comparing mouse norovirus and feline calicivirus) (Sabah Bidawid), the virulent strains of human noroviruses, and the role of irrigation waters in the transmission of human noroviruses and rotaviruses with emphasis on foodborne aspects (Charles Gerba and Nigel Cook).

Suresh Pillai, Charles Gerba and Doris D'Souza will work on submitting the proposal interlinking some of these ideas entitled "Occurrence and control of emerging foodborne viruses and parasites in produce and meats" for a full symposium.

Nominations were sought for the Vice Chair of the PDG. Kalmia Kniel was nominated by Suresh Pillai. She was selected unopposed by the committee as the incoming Vice Chairperson for the PDG.

Recommendations to Executive Board:

1. The nomination of Kalmia Kniel as Vice Chair of the Viral and Parasitic Foodborne Disease PDG by the committee members is recommended to the Board for approval.

Next Meeting Date: August 3, 2008.

Meeting Adjourned: 10:15 a.m.

Chairperson: Doris D'Souza.

Water Quality and Safety PDG

Members Present: Peter Kennedy, Susan McKnight, Michael Brodsky, Kathleen Rajkowski, Larry Cohen, Louise Fielding and Wendy Maduff.

New Members Present: Carol D'Lima, Ken Davenport, Barry Eisenberg and Sherri McGarry.

Visitors Present: Rick Gelting, Dan Cohn and Jack McCarthy.

Board Present: Vickie Lewandowski.

Meeting Called to Order: 9:05 a.m.

Recording Secretary of Minutes: Ken Davenport.

Old Business: Larry Cohen introduced Pete Kennedy as the new Chair. Members reviewed the June 22 conference call minutes, discussed the 2007 roundtable on water and discussed creating a "white paper" from the roundtable.

New Business: Vickie Lewandowski, Board Liaison, discussed the Board's view of the PDG's role, support and resources (Webinars and applied methods). She

encouraged symposia, applied proposals preferred, with a variety of speakers and inclusion of international topics with broad appeal, representation from the Water PDG on the International board and discussed roundtable vs. lectures and short symposia format.

Dean Davidson was voted in as the new Vice Chair without any objections.

PDG members discussed the importance of "potable" as a definition. There was discussion of this topic as the theme for a 2008 Roundtable/Symposia.

The group discussed mentoring students and using them as note takers for symposia and roundtables.

Discussion on a 2008 Roundtable Topic: potablility vs. drinkability, legal vs. non-legal aspects; US vs. international potabilitiy issues; US vs. international drinkable (definition); Certificate of Potability, no coliforms vs. other contaminants; frequency of water checks; types of checks, metals, volume, and chemicals. A white paper is to be developed from this topic. Pete Kennedy called for volunteers to develop the topic for the potability vs. drinkability roundtable. Kathleen Rajkowski volunteered with Susan McKnight as a drafter.

A potential 2008 symposia topic was discussed on groundwater to ingredient water; transportation issues with water for aircraft, trains and buses (The final US EPA Regulations to be completed in 2007).

Another idea for a 2008 symposia topic was suggested on water treatment technologies used for municipal, farms food processing, beverages or (point of use) and cooling towers or industrial applications. Filtration was also discussed using chemicals and without chemical treatment. Both ideas would need further development and or inclusion with another symposium topic.

A joint roundtable/symposia with the Produce PDG was discussed on the need for harmonization of irrigation water practices; legislative review; review of recreational water standards US vs. individual states, and international standards. Ecological challenges relating to safety, interface of surface water and ground water, non-microbial threat analysis, international reviews, case studies, animal agricultural impact on water quality, environment, local climate and the water cycle. Dr. Janet Thurston, a former presenter and expert, was suggested as a speaker on this issue involving animal agriculture.

The PDG discussed with Vickie how to get water topics from the PDG on the international symposia. Vickie told the PDG the international symposia are more independent and they chose their own topics. She directed us to talk to the international symposia organizing committee about participating on water topics for their events.

Recommendations to Executive Board:

1. Approve the election of Dean Davidson as Vice Chairperson.

Next Meeting Date: September 2007 Conference Call.

Meeting Adjourned: 11:00 a.m.

Chairperson: Peter Kennedy.

Affiliate Council Minutes

IAFP 2007 – July 8, 2007
Held at *Disney's Contemporary* Resort
Lake Buena Vista, Florida

Affiliates Present:

Alabama	Tom McCaskey
Alberta	Lynn McMullen
Associated Illinois	Dennis Gaalswyk
Australia	Trish Desmarchelier
Brazil	Maria Teresa Destro
British Columbia	Terry Peters
California	John Bruhn
Capital Area	Carl Custer
Florida	Peter Hibbard
Georgia	Sid Camp
Indiana	Helene Uhlman
Metropolitan	Don Schaffner
Michigan	Janet Phelps
Missouri	Steve Sikes
New York	Steve Murphy
New Zealand	Roger Cook
Ohio	Gloria Swick-Brown
Ontario	Kathy Wilson
Pennsylvania	Eugene Fry
Southern California	Margaret Burton
Texas	Fred Reimers
United Kingdom	David Lloyd
Upper Midwest	Dan Erickson
Washington	Stephanie Olmsted
Wisconsin	Randy Daggs

Board Members and IAFP Staff Present: Frank Yiannas, Gary Acuff, Stan Bailey, Vickie Lewandowski, Jeffrey Farber, Lee-Ann Jaykus, David Tharp, Lisa Hovey and Leilani McDonald.

Guests: Joe Heidenreich, Norway; Kathleen Glass and Cynthia Michalski, Wisconsin.

Meeting Called to Order: 7:08 a.m.

Recording Secretary of Minutes: Carl Custer.

Call to Order: The meeting was called to order at 7:08 a.m. by Affiliate Council Chair Maria Teresa Destro. There were 37 members and guests present. The minutes of the 2006 Affiliate Council Meeting were reviewed and approved.

Report from Affiliate Council Chairperson: Maria Teresa Destro acknowledged the 2007 Affiliate Award winners and announced a new Affiliate, Australian Association for Food Protection. She briefly introduced Leilani McDonald as Affiliate Staff Liaison. Affiliates were thanked for completing the 2007 Affiliate Survey. Leilani McDonald will E-mail the summary of survey feedback.

Report from IAFP President, Frank Yiannas: Frank Yiannas provided a report summarizing projects and activities over the past year. Membership dues have been restructured, leading to a 10 percent increase in Membership since January 1. It is now more affordable to join IAFP and Members may select the services or journals they wish to receive. Gold and Silver Sustaining Memberships have also increased over the last year. *JFP* Online continues to increase its reach, especially internationally, and the IAFP Web site has more than 24,000 monthly visitors. Frank announced that more than 2,000 attendees are expected at IAFP 2007 and that sponsorship increased this year. The Student PDG again is actively involved with supporting the Annual Meeting by serving as room monitors, holding their 8th student luncheon, and organizing a student mixer and job fair.

Frank also stressed IAFP's international involvement through the second European Symposium on Food Safety that was held in Barcelona, Spain, in November 2006. The Third Symposium is scheduled for October 2007 in Rome, Italy, along with a planned symposium for June 2008 in Latin America, most likely Brazil. IAFP also assisted in program development for a food safety conference to be held in Beijing, China, in September 2007. IAFP also supported Board Members' travel to Affiliate meetings recently held in Brazil, United Kingdom, New Zealand, and Korea, in addition to travel support for North American Affiliate meetings.

Report from the IAFP Office: David Tharp, Executive Director, reported that IAFP was in its best financial condition ever as of the last audited financial statements, August 31, 2006. The General Fund held $578,000 on that date, with the statement of activities showing $75,000 added from the FYE August 31, 2006 operations. David explained that IAFP has targeted to hold 50 percent of its operating budget in the General Fund. For the current year, that goal would be $1.2 million, which puts IAFP about half way there.

The Foundation also continues to grow, with a current balance of just more than $600,000. This includes a recent contribution from ConAgra of $150,000. The goal continues to grow the Foundation to $1 million by 2010. The Foundation once again sponsored Student Travel Scholarships, supporting five students for 2007: two from North America, two international, and one from a developing country. The students will be introduced at the Opening Session.

Leilani McDonald reminded those present that she is available to assist and serve the needs of their Affiliate organizations. As recommended to the Board in 2006, she will prepare and send a DVD of Annual Meeting photos to

Affiliates for viewing at their meetings. She invited Affiliates to maintain communications and correspondence with her at the IAFP office, so that activities and photos could be published in the quarterly *Affiliate View* and a new Affiliate DVD slide show be created for 2008.

Election of the Affiliate Council Secretary: Maria Teresa Destro announced that Roger Cook of the New Zealand Association for Food Protection received the sole nomination for Affiliate Council Secretary. Fred Reimers moved to call the vote; seconded by Lynn McMullen. Roger Cook was voted by acclamation.

Unfinished Business: The Affiliate slide show, absent in 2006, had been updated to a DVD slide show by Leilani McDonald and was playing continuously as Affiliates arrived for the meeting. The DVD was also being played continuously at the Affiliate booth.

New Business: Maria Teresa Destro opened discussion on the lack of an Affiliate Educational Session for the second year in a row, asking whether efforts should continue in the future. Discussion led to suggested topics and speakers, indicating a desire to continue efforts to hold the session. Maria Teresa Destro raised the issue of who should organize the session, and if a procedure, checklist, or other means of planning assistance could be established for future years.

Randy Daggs recommended that a local speaker be arranged for IAFP 2008 in Ohio, and that an Affiliate committee should fund expenses such as the room and beverages.

David Tharp, IAFP Executive Director, explained that the local Affiliate is often so busy with Local Arrangements obligations that it should not be expected to deliver the session without financial and planning help from all Affiliates. He asserted that it is difficult to host a quality session for under $2,000, and that the overall expense is often undermined by low attendance. He recommended the development of an organizing committee, noting that the Board has contributed $500 to the session in past years. Seconded by John Bruhn, who also recommended that the local Affiliate host a meal.

Peter Hibbard suggested that session attendance could increase if the session were held on Sunday, since travel time for many attendees prevents their attendance at Saturday functions; Terry Peters acknowledged the problem with travel time on Saturdays. The importance and expense of offering refreshments was briefly discussed. Tom McCaskey recommended holding the session during the Affiliate Council Meeting, which could begin one half hour earlier; seconded by John Bruhn. Roger Cook commented that Saturday workshops may conflict with the Saturday session. Maria Teresa Destro maintained that the session continue to be scheduled prior to the Welcome Reception, and Steve Murphy asked for a show of hands in favor of Saturday afternoon (eleven raised).

Stephanie Olmsted suggested an educational session on Web site construction; Don Schaffner offered to present this topic in 2008. Janet Phelps suggested the topic of leadership development.

Randy Daggs moved to form a committee to organize an educational session to be held during the Affiliate Council Meeting; seconded by Sid Camp; passed. Volunteering for the committee were Janet Phelps, Don Schaffner, Carl Custer, and Gloria Swick-Brown.

Maria Teresa Destro announced that only 18 of the 42 Affiliates had submitted the required Annual Report in March, and that this is the Association's only way to assess an Affiliate's level of activity for recognition. It was agreed that the monthly E-mail reminders to Affiliate officers were effective, but that the reminder should emphasize the Affiliate Secretary's responsibility in completing and submitting the report. Fred Reimers explained that his Affiliate's officers all review the final report before it is submitted, to ensure accuracy and adherence to the filing deadline. It was acknowledged that the Report is required, and that the possibility of appearing on a "list of shame" of non-filing Affiliates might encourage more to file. John Bruhn commented on the low turnout of Delegates at this meeting.

Recommendations to the Executive Board: No official recommendations at this time.

Affiliate Reports: Delegates offered a summary of their Affiliate's activities and accomplishments in the past year.

Passing of the Gavel: Chairperson Maria Teresa Destro passed the gavel to Carl Custer, signifying the beginning of his term as Affiliate Council Chair.

Next Meeting Date: Sunday, August 3 at IAFP 2008.

Adjourned: 9:42 a.m.

Chairperson: Maria Teresa Destro.

Recommendations to the Executive Board as Taken from Committee Minutes of Meetings Held in Lake Buena Vista, Florida

Executive Board Response as Discussed at the Executive Board Meeting

Food Protection Trends Management Committee

Recommendations to the Executive Board:

1. The three *FPT* cover pictures stay the same in 2008, and a picture library will be generated by soliciting pictures from authors, committee members, and general members, or through purchasing from commercial sources for potential use in the future.
   Board response: Agree and the Board encourages *FPT* Management Committee members to submit pictures for consideration and to solicit pictures from other sources.
2. The Executive Board assigns reviewers for the manuscript submitted by Christine Bruhn et al., in the absence of Ed Zottola, so that the manuscript can appear as a peer reviewed article in *FPT*.
   Board response: Agree. The Board will take action on this manuscript.
3. The appointment of a new Scientific Editor for a 4-year term.
   Board response: Agree. The search will begin in August for an Editor to begin January 2008.
4. The appointment of an alternate Scientific Editor.
   Board response: The Board does not feel that an alternate Editor is needed.
5. The Instructions to Authors for *FPT* are reviewed and revised. The committee has appointed a sub-committee to review and revise these instructions pending board approval. The subcommittee includes Michelle Danyluk, Richelle Beverly and LeeAnne Jackson.
   Board response: Agree.
6. The older *DFES* research articles are scanned and made available electronically, as many of these articles have very limited availability.
   Board response: Agree.

Journal of Food Protection Management Committee

Recommendations to the Executive Board:

1. Develop a marketing plan for IAFP in general and *JFP* specifically for developing international sectors.
   Board response: The Board requests that the *JFP* Management Committee appoint a sub-committee to work with IAFP staff.
2. Reappoint John Sofos as Scientific Editor for another 4-year term.
   Board response: Agree

Program Committee

Recommendations to the Executive Board:

None.

3-A Committee on Sanitary Procedures

Recommendations to the Executive Board:

1. 3-A CSP supports and endorses the white paper on raw milk written by Dairy Quality and Safety PDG and, further to request that the IAFP Board accept it as an IAFP Position on the topic.
   Board response: Will review the paper when submitted for Board review and act accordingly.
2. The committee further asks for continued Board support in all things great and small.
   Board response: Agree.

Audiovisual Library Committee

Recommendations to the Executive Board:

None.

Committee on Control of Foodborne Illness

Recommendations to the Executive Board:

1. We recommend that the 6th edition of the *Procedures to Investigation of Foodborne Illness* manual be initiated, including evaluation of other material such as the WHO manual. This would include the use of a combination of audit methods and forensic investigations.
   Board response: Agree and encourage the Committee to place a priority on this project.
2. We seek input on revision of other manuals (water, vectorborne and HACCP) or new areas that the Board has thoughts about. One thought was a guidance document for the retail trade.

Board response: The Board suggests the Committee conduct a review of the waterborne manual as this was last revised in 1996. Efforts should be coordinated with the Water PDG.

3. The Committee wants to explore management culture affecting food safety.
   Board response: Agree and feel this is a topic of interest.
4. The Committee wants to explore the link between traceability and surveillance to reduce foodborne illness.
   Board response: Agree and feel this is a topic of interest.

Constitution and Bylaws Committee

Recommendations to the Executive Board:

1. The Committee recommends the following new members for the C&B committee:

   Ann Draughon, Jenny Scott, Kathy Glass, Paul Hall and Bob Gravani.
   Board response: Agree and ask that David Tharp contact the potential new Committee members to solicit their help.
2. The Committee recommends that current Chairperson Randy Daggs and Vice Chairperson Steve Murphy be reappointed.
   Board response: Agree.

Foundation Committee

Recommendations to the Executive Board:

None.

Membership Committee

Recommendations to the Executive Board:

1. The Membership Committee wants to make some recommendations to the Board to consider whether to develop a strategy:
   - To retain members (lowering dues was a good step).
   - Attract more students to attend [and] [delete "the"] join IAFP as growth for the future IAFP Members after graduation (perhaps more pro-active mentoring of students).
   - Broadening international members such as working more closely with international groups as the Society ~~of microbiologists~~ [for Mircobiology].

   The Membership Committee is asking for guidance from the Board in these areas and if there is a strategy, what role should the committee play.
   Board response: Agree and encourage the Committee to lead these efforts with staff assistance.
2. The Membership Committee would like the Board to consider whether a conscious effort should be made to broaden the scope of the IAFP's focus in food safety to other non-microbial areas of food protection and food quality. Outreach activities to garner more involvement from food toxicology, DVMs and applied science as starting points to broaden the IAFP Membership base.
   Board response: The Board supports outreach efforts to other groups involved in food safety that align with IAFP's mission.
3. The Committee would like to draft a questionnaire for Board approval for the IAFP International Members and non-members attending Annual Meetings. Leon Gorris, Susan McKnight and Lisa Hovey will make a 2nd draft, circulate it to Jenny Scott and John Bruhn and then submit to the Board for approval to E-mail to this community.
   Board response: Agree.

Nominating Committee

Recommendations to the Executive Board:

None.

Past Presidents' Committee

Recommendations to the Executive Board:

1. Confirm eligibility of donations to IAFP for tax deduction for Canadian citizens.
   Board response: Agree. Staff will research and report to the Board.
2. Consider developing white papers from Rapid Response Symposium.
   Board response: A Symposium summary was printed in *FPT*.
3. Track new members from meetings (outside annual meeting) as a measure of their impact.
   Board response: Agree. Staff will research and report to the Board.
4. Accept Guidelines for Ethical Conduct with minor changes in verbiage.
   Board response: Board will review and discuss [Note, the Board accepted the Guidelines later in the meeting].
5. Remind Program Committee Chair to communicate with the remaining committee members regarding late-breaking sessions.
   Board response: Agree.
6. Recommend changing the time of the Past Presidents' Committee meeting to Saturday, 4 p.m.–5 p.m. before the Welcome Reception.
   Board response: Agree.

Applied Laboratory Methods PDG

Recommendations to the Executive Board:

1. Continued support for yearly teleconference and web-based presentations to be determined.
   Board response: Agree.

2. A one-day meeting room on Saturday at the 2008 IAFP Annual Meeting for purpose of the Sample Prep Working Group meeting to include lunch and refreshments, if possible.
   Board response: Agree.
3. Approve Vanessa Cranford as the Vice Chair for 2007–2009.
   Board response: Agree.

Beverage PDG

Recommendations to the Executive Board:

1. Recommend to schedule PDG meetings having similar/overlapping subjects at appropriately separate meeting times to allow attedance by all interested PDG members.
   Board response: Agree. If a specific request for schedule change is needed, contact the IAFP office
2. Approve Frank Burns as Vice Chair.
   Board response: Agree.

Dairy Quality and Safety PDG

Recommendations to the Executive Board:

1. Approve Allen Sayler as PDG Vice Chair, to become Chairperson at the 2009 meeting.
   Board response: Agree.

Food Chemical Hazards and Food Allergy PDG

Recommendations to the Executive Board:

1. To provide support and resources for setting up regular PDG conference calls and Webinars.
   Board response: Agree.
2. IAFP collaborate with other associations (e.g., AOAC, ACS, IFT) to develop symposia/workshops on topics of mutual interests (issues related to chemcal contaminants and food allergens).
   Board response: Agree and encourage the PDG Members to actively pursue these efforts.
3. Encourage symposium organizers to include recruitment of international speakers so that a global perspective on food safety issues can be presented.
   Board response: Agree.

Food Hygiene and Sanitation PDG

Recommendations to the Executive Board:

1. Approve Todd Rossow as the new Vice Chairperson.
   Board response: Agree.

Food Law PDG

Recommendations to the Executive Board:

1. That the IAFP staff establish e-mail subdirectories containing members of specific PDGs that can be accessed by members to connect with their PDG during the year.
   Board response: Agree. This is done twice a year, both prior to Annual Meeting and following Annual Meeting. Contact the IAFP office at any time for an updated list.

Food Safety Education PDG

Recommendations to the Executive Board:

None.

Fruit and Vegetable Safety and Quality PDG

Recommendations to the Executive Board:

None.

Meat and Poultry Safety and Quality PDG

Recommendations to the Executive Board:

1. Recommend that time be allotted for late-breaking topic.
   Board response: Agree and suggest contacting the IAFP office when a late-breaking topic occurs that should be considered.
2. Communicate activity on late-breaking topics as early as possible.
   Board response: Agree.
3. Approve election of Tim Freier as Vice Chairperson.
   Board response: Agree.

Microbial Risk Analysis PDG

Recommendations to the Executive Board:

None.

Retail Food Safety and Quality PDG

Recommendations to the Executive Board:

1. The Retail Food Safety and Quality PDG recommends that the Executive Board continue its efforts to reduce the overlapping of PDG meeting schedules. The PDG recommends that meetings be reduced to an hour and a half to facilitate scheduling.
   Board response: The Board suggests keeping with a two-hour meeting time and encourages PDG Members to discuss topics of interest to the group.
2. Approve the election of Ann Marie McNamara as Vice Chairperson to begin term at IAFP 2008 in Columbus, Ohio.
   Board response: Agree.

Seafood Safety and Quality PDG

Recommendations to the Executive Board:

1. Scatter the meeting times for PDGs.
   Board response: Schedule is fairly standard from year to year. Inform the IAFP office if there are specific schedule conflicts to consider.
2. Approve the election of Kathleen Rajkowski as Vice Chairperson.
   Board response: Agree.

Student PDG

Recommendations to the Executive Board:

None.

Viral and Parasitic Foodborne Disease PDG

Recommendations to the Executive Board:

1. The nomination of Kalmia Kniel as Vice Chairperson of the Viral and Parasitic Foodborne Disease PDG by the Committee members is recommended to the Board for approval.
   Board response: Agree.

Water Safety and Quality PDG

Recommendations to the Executive Board:

1. Approve the election of Dean Davidson as Vice Chairperson.
   Board response: Agree.

Affiliate Council

Recommendations to the Executive Board:

1. Recommend using affiliate delegates' experience for 100th anniversary e.g. Gloria Swick-Brown and Helene Uhlman.
   Board response: When a 100th Anniversary team is assembled, Affiliate Council members will be included.

Congratulations . . .

At IAFP 2007, 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

Gary N. Parenteau
HANNA Instruments
Woonsocket, Rhode Island

IAFP 2008 Annual Meeting Registration

Diane S. Wood
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rtech Laboratories, Division of Land O'Lakes	Treasury of Country Recipes	Craig Henry
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	Food Safety and Security T-Shirt–Small	John Eade
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Technical–Scheduled, 15-minute oral presentations, including a two- to four-minute discussion.

Poster–Permits the author and attendees to discuss research presented.

Note: The Program Committee reserves the right to make the final determination on which format will be used for each presentation

Developing Scientist Awards Competition

The Developing Scientist 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 in both Technical and Poster categories.

Deadlines and Notification

Abstract Submission Deadline: January 29, 2008
Submission Confirmations: Within 48 hours of submission
Acceptance/Rejection Notification: March 21, 2008

Questions regarding abstract submission can
be directed to Tamara P. Ford,
515.276.3344 or 800.369.6337;
E-mail: tford@foodprotection.org

Call for Abstract Instructions and Submission form available at

www.foodprotection.org

Call for Nominations 2008 Secretary

A representative from the government sector will be elected in March of 2008 to serve as IAFP Secretary for the year 2008–2009.

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

Carl S. Custer
c/o International Association for Food Protection
6200 Aurora Ave., Suite 200W
Des Moines, IA 50322-2864, USA

The Secretary-Elect is determined by a majority of votes cast through a vote taken in March of 2008. Official Secretary duties begin at the conclusion of IAFP 2008. The elected Secretary serves as a Member of the Executive Board for a total of five years, succeeding to President, then serving as Past President.

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

Nominations Close November 1, 2007

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UPDATES

Bill Coats Named to Leadership of 3-A Sanitary Standards, Inc.

3-A Sanitary Standards, Inc. (3-A SSI) announces the appointment of William (Bill) Coats, associate deputy administrator of Grading and Standards, US Dept. of Agriculture, Agricultural Marketing Service, to the 3-A SSI Board of Directors.

Mr. Coats began his career at USDA as a commodity grader in Tobacco programs and has been with AMS for more than 33 years. He served as the chief of the Standardization and Review Branch before his selection as the Associate Deputy Administrator. Mr. Coats has been a leader within USDA and was instrumental in the establishment of the Agricultural Commodities Certification Association.

A native of Horse Cave, KY Mr. Coats was raised on a tobacco and dairy farm where he managed the family Grade A dairy operation. He earned a bachelor of science degree in agriculture from Western Kentucky University, Bowling Green, KY.

FKI Logistex North America Appoints Chris Roach Vice President of Customer Service

FKI Logistex® announces the appointment of Chris Roach to the new position of vice president, customer service, FKI Logistex North America. Reporting to Steve Ackerman, president, FKI Logistex North America, Mr. Roach assumes responsibility for all North American parts sales, parts order fulfillment operations, and hotline technical support.

"Chris is well-equipped to lead the FKI Logistex team in providing reliable, qualified, and responsive customer service," says Mr. Ackerman.

"Meeting our customers, needs by providing seamless, integrated aftermarket support is critical not only to their success, but also to the success of FKI Logistex," says Mr. Roach. "I'm looking forward to leading a team that will exceed our customers' expectations."

Mr. Roach has a bachelor's degree in electronics engineering from DeVry University, and a master's in business administration from Michigan State University. He brings 17 years of engineering, management, and leadership experience to his new position. Prior to his appointment as vice president, Mr. Roach was director of the Parts Group for FKI Logistex Manufacturing Systems North America. He has previously held management and engineering positions at Diamond Electric Manufacturing Corporation, Excel Communications, Inc., and American Greeting Card Corporation.

Sara Goetz Appointed Chemistry Group Leader at Q Laboratories, Inc.

Sara Goetz has been promoted to the position of Group leader of the analytical chemistry department at Q Laboratories, Inc. Ms. Goetz has worked as an analyst at Q Laboratories, Inc. since 2001, and holds a bachelor of science degree in chemistry from Northern Kentucky University. As group leader, Ms. Goetz will be responsible for optimizing sample turn-around time, responding to client inquiries and requests and maintaining the overall excellence of the chemistry laboratory and laboratory staff.

Gainco Appoints James Khoury New Engineering Director

Gainco, Inc., announces that James M. Khoury has joined the company as director of electrical and software engineering. In this position. Mr. Khoury will manage all activities pertaining to the engineering and development of Gainco products and systems. He will also be a member of the company's strategic management team.

Mr. Khoury comes to Gainco with more than 25 years of experience in the engineering field. Prior to joining Gainco, he was employed by Nordson Corporation for over 10 years, where he held senior engineering and managerial positions in the company's product development, corporate research and technology departments. He has also held positions with two NASA subcontractors, Life Systems, Inc. and Loral AeroSys, where he had extensive technical involvement with circuit boards, embedded code and software development plus network distribution control systems, among other responsibilities.

Mr. Khoury holds a BSEE degree from Cleveland State University's Fenn College of Engineering.

UPDATES

Lundberg Family Farms® Hires Nils-Michael Langenborg as Vice President of Marketing

Lundberg Family Farms® is pleased to announces the appointment of Nils-Michael Langenborg to the newly created position of vice president of marketing. Mr. Langenborg has a track record of analytical and creative achievements in consumer and business-to-business markets. At Lundberg Family Farms,® he will be responsible for the company's marketing efforts and will play a key role as a member of the executive management team.

Mr. Langenborg brings a wealth of experience in sales and marketing for consumer products companies, with over 12 years in the natural foods industry. He has worked with several top natural food manufacturers, including Strauss Family Creamery, Spectrum Organic Products and Traditional Medicinals.

He has earned a BS in marketing from California State University in San Francisco and is currently working on a MBA in sustainable enterprise from Dominican University in San Rafael, CA.

NEWS

FDA Announces Program to Enhance States' Food Safety Programs

The US Food and Drug Administration has launched a national program to bring about the adoption of more uniform, equivalent, and high quality regulatory programs by state agencies responsible for regulating facilities that manufacture, process, pack, or hold food under FDA's jurisdiction.

"This risk-based program represents a significant step in further integrating our food safety system," said Margaret O'K. Glavin, FDA's associate commissioner for regulatory affairs. "We realize it will be several years before it's fully implemented, but we're confident this program will bring great benefits to the public health."

Currently, programmatic activities can vary from state to state and such variations can lead to inconsistencies in oversight of food safety. Adoption of voluntary standards for state regulatory programs will establish a uniform basis for measuring and improving the performance of state programs for regulating manufactured food and help the state and federal authorities reduce foodborne illness hazards in food facilities.

The Manufactured Food Regulatory Program Standards are the result of five years of intensive cooperative effort by federal and state regulators. The standards define best practices for the critical elements of state regulatory programs designed to protect the public from foodborne illness and injury, including: the program's regulatory foundation; staff training; inspection; quality assurance; food defense preparedness and response; foodborne illness and incident investigation; enforcement; education and outreach; resource management; laboratory resources; and program assessment.

Each standard has corresponding self-assessment worksheets. Several standards have supplemental worksheets and forms to assist state regulators in determining whether their state program addresses all of the elements in the standards.

FDA Nanotechnology Report Outlines Scientific, Regulatory Challenges

The US Food and Drug Administration (FDA)'s Nanotechnology Task Force released a report that recommends the agency consider developing guidance and taking other steps to address the benefits and risks of drugs and medical devices using nanotechnology.

"Nanotechnology holds enormous potential for use in a vast array of products," said Commissioner of Food and Drugs Andrew von Eschenbach, M.D., who endorsed the Task Force Report and its recommendations on July 23, 2007. "Recognizing the emerging nature of this technology and its potential for rapid development, this report fosters the continued development of innovative, safe and effective FDA-regulated products that use nanotechnology materials."

Scientists and researchers increasingly are working in the nanoscale, creating and using materials and devices at the level of molecules and atoms—1/100,000th the width of a human hair.

The FDA's Task Force Report on nanotechnology addresses regulatory and scientific issues and recommends FDA consider development of nanotechnology-associated guidance for manufacturers and researchers. The Task Force was initiated by Commissioner von Eschenbach in 2006.

The Task Force reports that nanoscale materials potentially could be used in most product types regulated by FDA and that those materials present challenges similar to those posed by products using other emerging technologies. The challenges, however, may be complicated by the fact that properties relevant to product safety and effectiveness may change as size varies within the nanoscale.

The report also says that the emerging and uncertain nature of nanotechnology and the potentially rapid development of applications for FDA-regulated products highlight the need for ensuring transparent, consistent, and predictable regulatory pathways.

Anticipating the potential for rapid development in the field, the report recommends consideration of agency guidance that would clarify, for example, what information to give FDA about products, and also when the use of nanoscale materials may change the regulatory status of particular products. As with other FDA guidance, draft guidance documents would be made available for public comment prior to being finalized.

In addition, the report says the FDA should work to assess data needs to better regulate nan-

otechnology products, including biological effects and interactions of nanoscale materials. The agency also should develop in-house expertise and ensure consideration of relevant new information on nanotechnology as it becomes available, according to the report. FDA should evaluate the adequacy of current testing approaches to assess safety, effectiveness and quality of nanoscale materials.

FDA and 22 other federal agencies are part of the National Nanotechnology Initiative, a federal research and development program established to coordinate the multi-agency efforts in nanoscale science, engineering, and technology.

For more information: FDA Nanotechnology Report PDF: www.fda.gov/nanotechnology/taskforce/report2007.pdf; Report HTML: www.fda.gov/nanotechnology/taskforce/report2007.html; Consumer Article: www.fda.gov/consumer/updates/nanotech072507.html; National Nanotechnology Initiative: http://www.nano.gov/ and Fact sheet: http://www.fda.gov/nanotechnology/taskforce/factsheet2007.html.

Veterinary Public Health Workforce Expansion Act

The Veterinary Public Health Workforce Expansion Act has been approved by the US Senate. The act, sponsored by Senator Wayne Allard (R-CO), authorizes a competitive grants program to increase capacity in the nation's veterinary medical colleges and alleviate the critical shortage of veterinarians. The Workforce Act was offered as an amendment to the Higher Education Authorization Bill, which passed in the Senate by a vote of 95 to zero.

"The Veterinary Public Health Workforce Expansion Act will allow us to increase our educational capacity for veterinary students, respond to the national need for veterinarians in public health sectors, and provide services to our rural communities," said Dr. Timothy Boosinger, dean of the College of Veterinary Medicine at Auburn University and president of the Association of American Veterinary Medical Colleges (AAVMC). "We thank Senator Allard for his leadership and efforts in addressing the needs of our veterinary workforce."

The Veterinary Public Health Workforce Expansion Act has been the highest federal legislative priority for the AAVMC for several years. The AAVMC has worked closely with the American Veterinary Medical Association, allied veterinary medical association groups, and industry and government partners to pass this legislation. The legislation now goes to the Education and Labor Committee in the US House of Representatives. The AAVMC will work with the House to ensure that veterinary medical colleges, departments of veterinary science, departments of comparative medicine, and entities offering residency training programs or academic programs that offer postgraduate training for veterinarians are able to get the resources that will enable them to increase the number of veterinarians in their graduating classes.

"I applaud the Senate for passing the Higher Education Authorization Bill which included the Veterinary Public Health Workforce Expansion Act to address the shortage of veterinarians working in the public health practice," said Senator Allard. "The nation's veterinary medical colleges do not have the resources necessary to meet the demand for veterinarians who are vital to maintain public health preparedness."

"We appreciate the Senate's recognition of the need to assist the nation's 28 colleges of veterinary medicine with their responsibility to address the serious workforce shortages in veterinary public health. Veterinarians have a vital role in fulfilling society's public health needs," added Dr. Lawrence E. Heider, executive director of the AAVMC.

Lessons from the Latest Botulism Outbreak

An interstate outbreak of botulism has occurred, comprising two cases in Indiana and two in Texas, with others under investigation in California, Hawaii, and Ohio. The US Centers for Disease Control and Prevention's Morbidity and Mortality Weekly Report has a posting dated July 30, 2007 describing the outbreak. It says that the illnesses are due to botulinum toxin type A associated with Castleberry's hot dog chili, and that this is the first outbreak involving a commercially canned product since 1974. The limited, voluntary recall has been extended by Castleberry to approximately ninety brands of human and dog foods that were distributed to forty-nine US states.

This event has not received all the publicity it deserves, and it seems likely that some of what should be learned from the incident will go unnoticed.

Recent outbreaks and recalls have evoked a clamor from the public and our legislators for a unified food safety agency and ever more inspection. In fact, the US food safety system has a remarkable record, especially as regards low-acid (pH > 4.6), canned food. Because the Castleberry's products contained a good deal

of meat, the establishment was surely operating under continuous inspection by the USDA Food Safety and Inspection Service (FSIS). "Continuous inspection" means that an establishment cannot operate without one or more FSIS inspectors present. Furthermore, the retorts, processes, and operators in these establishments must be certified. No matter how US food safety agencies might be organized, it is hard to imagine any food product being subject to more intense scrutiny than this, which seems to me to show that systems operated by human beings are inherently imperfect and that the insistence on a zero-risk food supply is unrealistic.

The recall to date has not gone as well as could be hoped. Some would say that this indicates the inadequacy of voluntary – as opposed to mandatory – recalls. In fact, the recall system depends strongly on the public communications media, which tend not to put great emphasis on events in which no deaths have occurred. Beyond this, recalls are not especially newsworthy because the public has been bombarded with recalls due to allergens in foods that threaten a limited portion of the population and because the media insist on using the word tainted, which seems to connote spoilage rather than a real threat to health.

When an outbreak is detected, the authorities use a trace-back system to find the source of the food. These have worked well for canned foods. When the source is located, the challenge involves doing a valid trace-forward of the distribution of that food. Trace-forward actions present special problems in that many food items are sold through very small-scale retail establishments, and some canned foods are given away via food banks to homeless people who are hard to find after-the-fact. It should also be noted that Castleberry voluntarily expanded the recall to include many products that were not known with certainty to be at risk. A mandatory recall might well have been much narrower.

The political approach to enhanced food protection seems to entail making the relationship between government and the food industry as adversarial as possible. In point of fact, the food industry and government have cooperated rather well, and this gives the consumer a great deal of food protection at low cost. Creating a single federal food safety agency and staffing it with more inspectors than there are employees in the food industry would probably not have prevented this outbreak. Americans spend proportionately less of their disposable income on food than anyone else in the world. The minuscule gains that could be achieved by a high-profile, adversarial inspection system would cost everyone huge amounts both in higher food prices and in taxes.

A putative zero-risk system that enhances hunger more than safety would be detrimental to public health. Over any reasonable period, not eating is more hazardous than eating.

Dean O. Cliver, Ph.D., is Professor of Food Safety at the University of California-Davis and an ACSH Advisor.

USDA Awards $5.5 Million for Risk and Prevention Research of *E. coli* O157:H7 in Fresh Produce

Agriculture Secretary Mike Johanns has announced that USDA is furthering its research on the safety of fresh produce. Nearly $5.5 million will support collaborative research to identify risk factors and preventive measures for *E. coli* O157:H7 contamination in fresh produce.

"This research will help producers identify the sources of *E. coli* O157:H7 and ways to avoid contamination," Johanns said. "Developing new research and prevention tactics for the grower will contribute to assuring produce safety for consumers."

USDA's Agricultural Research Service (ARS) and Cooperative State Research, Education, and Extension Service (CSRES) are providing the funding to ARS researcher Rob Mandrell and his collaborators at the University of California to continue their research in the Central Valley of California. Over the next three years ARS will contribute $5 million and CSREES will contribute $470,999. In 2006, CSREES awarded Rob Mandrell and colleague Robert Atwill at University of California-Davis $1.2 million to do research in the Salinas Valley.

Mr. Mandrell will address where *E. coli* O157:H7 originates, how it survives on the plant, and what factors lead to an increase in produce-related outbreaks. Potential risk factors include animals, land practices, packing and processing processes and wildlife.

Additionally, the project will feature workshops and publications to educate the animal operators, natural resource managers and the public about animal diseases that can be transferred to humans, how animal waste can contaminate water sources, and beneficial management practices for maintaining and improving water runoff quality.

Outbreaks of *E. coli* O157:H7 illness associated with fresh lettuce or spinach have been associated with pre-harvest contamination.

FSAI Advises Industry on Publishing Guides to HACCP

The Food Safety Authority of Ireland (FSAI) has published a new guidance document (Guidance Note 23) for the food industry, which will assist food business operators to develop their own guidance documents to achieve best hygiene practice. Recently introduced food hygiene legislation allows for the development and official recognition of these guides as a means of complying with the food law. The FSAI's Guidance Note 23 will be of interest to food business sectors developing guides throughout the food chain and will help to harmonize the interpretation of food safety and hygiene legal requirements in a way that takes account of sector specific food production practices.

The Guidance Note sets out a recommended process for the development of guides to good practice for hygiene. It is divided into two sections. The first section explains, in a step-by-step approach, the recommended process for developing guides and having them recognized by the authorities and notified to the European Commission. The second section provides more detailed advice on what the content of the guides should be, gives recommendations on the scope of guides, terms and definitions, technical content and suggested format.

According to Dr. Wayne Anderson, chief specialist food science, FSAI, the objective is to encourage food business sectors to produce the appropriate information guides tailored for their particular needs to ensure compliance with the food law.

"Our hope is that our Guidance Note will provide the necessary clarification and impetus to ensure the various business sectors within the food industry produce their own guides. We are a resource to the industry in this regard, providing advice and counsel on the appropriateness of content. Working together with industry, the ultimate ambition is to facilitate the production of the safest food possible in the most practical way for each food business sector," says Dr. Anderson.

The Guidance Note is freely available to download from the FSAI Web site http://www.fsai.ie/publications/guidance_notes/gn23.

INDUSTRY PRODUCTS

Torrey Pines Scientific, Inc.

Torrey Pines Scientific, Inc. New High Capacity Chilling/Heating Dry Baths Feature Five Program Memory

Torrey Pines Scientific, Inc. announces its EchoTherm™ Model IC35 Series Peltier-driven chilling/heating heavy-duty dry baths. These units are capable of handling a large variety of sample blocks with the largest sample capacities available.

The IC35's are fully programmable and can store 5 programs in memory with 10 steps per program for instant recall and use. Each program can be made to repeat automatically from 1 to 99 times.

The IC35 (-10°C to 100°C) and IC35XT(-20°C to 100°C) can freeze, chill, or heat samples in a variety of sample blocks that can hold 0.5 ml to 50 ml centrifuge tubes, test tubes, vials, assay plates, and even round-bottom flasks.

Torrey Pines Scientific, Inc.
760.471.9100
San Marcos, CA
www.torreypinesscientific.com

GLS Dynaflex® G2700 TPE Series Wins FDA Clearance for Direct Food Contact Applications

GLS Corp. has announced that its entire line of Dynaflex® G2700 TPEs has been given clearance by the US Food and Drug Administration (FDA) for use in direct food contact applications, including both fatty and non-fatty foods. This approval expands the range of packaging applications for the Dynaflex G2700 TPE series, which previously held FDA approval for limited food contact. Dynaflex TPEs are made with Kraton® polymers.

"With this new FDA approval, our customers gain the flexibility to use one family of GLS TPEs for all their food packaging applications," said Walter Ripple, director of sales and marketing for GLS Corp. "No other competitive materials can make this claim for a full line of grades. This means one-stop shopping and greater simplicity for packaging manufacturers."

Previously, styrene ethylene butylenes styrene (SEBS) products from GLS were cleared for use in direct food contact applications for non-fatty foods. Now FDA has broadened approval to cover fatty foods as well. Further, the clearance carries no restrictions for use in adhesives, food packaging, and food storage applications. It also allows for contact with all food types and high-temperature food contact applications. GLS can also compound other custom grades that have full FDA clearance.

GLS' Dynaflex G2700 series compounds are easy-processing TPEs designed for injection molding and extrusion applications that require FDA compliance. Available in a hardness range from 28 to 64 Shore A, they feature a soft touch, rubbery feel, excellent colorability, good melt stability, high flow for long, thin-wall parts, good adhesion to polypropylene, and good ozone and UV resistance. Depending on the grade, they are available in either natural or clear pellets. Drying is not required. Regrind levels of up to 20 percent can be used with minimal property loss, provided the regrind is free of contamination.

GLS Corporation
800.457.8777
McHenry, IL
www.glscorporation.com

Dickson Recent Trends in Data Loggers and Chart Recorders

Dickson offers many different data loggers and chart recorders with many features to fit into every application. We have data loggers and chart recorders with displays, alarms, probes, and many other features.

The improvements in temperature and humidity data loggers and chart recorders are no mere bells and whistles. Rather, they can translate into significant savings in the man-hours that pharmaceutical quality managers devote to monitoring conditions in both processing

and storage areas. Many of the new features on data loggers also make it highly unlikely that emerging temperature and/or humidity problems can advance far enough to jeopardize product quality.

When sourcing temperature and humidity data loggers or chart recorders, the key is to ensure that you are tuned into instrument sources with a wide array of data logger and chart recorder options so that you are able to select the basic instrument and features that are best suited for your specific applications.

The Dickson Co.
800.323.2448
Addison, IL
www.dicksondata.com

Eagle's Deep-drawn Sinks with New Euro-style Design Offer Optimum Sanitation and Efficiency

Deep-drawn bowl sinks have just received a facelift with the introduction of the new Euro-style design from Eagle Foodservice Equipment. These sinks combine the latest advancements in highly functional design with corrosion-free construction to optimize sanitation and efficiency in kitchen prep areas and other foodservice operations.

New Euro-style edging on these sinks makes it easier to keep the surrounding work and floor areas clean, while a new bowl design provides more space and maneuverability for washing compared to competitors' sink models.

Offered with a choice of one, two, three or four bowl compartments, Eagle's Euro-style sinks feature heavy-gauge stainless steel construction – including the bowls, drainboards and backsplash components. All models are approved by the National Sanitation Foundation (NSF).

The sink bowls feature a deep-drawn, one-piece seamless construction, along with a swirl-away drainage design for complete evacuation of water. The Euro-style edging prevents spillage and promotes cleanliness of the floor area around the sink, while the drainboard's die-stamped "crease" design enables faster and more complete water drainage.

Eagle's Euro-style deep-drawn sinks are constructed for rugged durability. This includes front-to-back leg braces for added rigidity and elimination of "wobble." The leg gussets are welded to a die-cut heavy-gauge reinforcing plate to optimize sturdiness.

Most Eagle Euro-design sink models come with a standard 10-inch backsplash element featuring a 1-inch upturn and tile edge for easy installation and "feathering" to any wall-splash surfaces. Other models feature a 2-inch higher backsplash, allowing for a higher faucet clearance as well as 2-inch deeper sink bowls – thereby providing four inches additional space for washing larger items.

In addition to standard product offerings, custom sink configurations are available to meet special layout requirements, including drop-in bowl configurations. Sound deadening is also available.

Eagle Foodservice Equipment
Clayton, DE
800.441.8440
www.eaglegrp.com

New Videojet® 3430 Laser Coder Features Best-in-Class Speeds, Flexible Integration

Combining high-speed coding and 50 watts of laser power in one mobile unit, the new Videojet® 3430 laser marking system from Videojet Technologies Inc. provides best-in-class speeds for high-throughput lines and an IP65-rated housing for increased reliability, even in dirty and wet environments. Flexible system components like an articulated arm and a small marking head provide seamless integration in tight production line areas.

"With marking speeds up to 2,000 characters per second and line speeds up to 50 feet per second, the Videojet 3430 delivers the highest speeds in its class," says Dr. Dietmar Gnass, director of research and development for Videojet's laser business unit. "No other laser coder provides such high data throughput and permanent, crisp quality marks without degradation of code clarity."

The Videojet 3430 is ideally suited for applications demanding fast and flexible data transfer and marking processes, such as beverage, brewing, food, packaging, and extrusion applications. Moderate-speed lines, such as those in the personal care products, pharmaceuticals and industrial component industries, also will benefit from the superior speed and resolution of the Videojet 3430 laser.

Because of its integrated user interface, small marking head, and flexible, articulated arm, the laser integrates quickly and easily into any production line and allows the system to be moved to different lines

Videojet Technologies Inc.

as coding needs change. The IP65-rated stainless steel housing and self-contained cooling system ensure high uptime even in dirty, dusty and wet environments.

Additional advantages of the Videojet 3430 include the ability to choose from languages for display on the user interface, and the password-protected security levels provided by the proven Microsoft® Windows®-based SmartGraph™ software. With high reliability and no consumables such as inks, solvents or compressed air required, the system sets new standards for economical and maintenance-free operation.

The launch of the Videojet 3430 completes a full line of best-in-class, state-of-the-art laser marking systems from Videojet. This family of laser coders includes the 10-watt Videojet 3120, the 30-watt Videojet 3320 and the 50-watt Videojet 3430 systems.

Videojet Technologies Inc.
800.843.3610
Wood Dale, IL
www.videojet.com

Strongarm Designs Introduces First Industrial-strength Stainless Steel Mouse

Strongarm Designs' latest plant floor/process area innovation, the Stainless Steel Mouse, increases the accuracy and efficiency of operator industrial data input, reducing costly data entry errors.

"In the early days of plant floor computing, industrial pointing devices were sufficient to run the simple software applications of the time," said Bill Fleming, Strongarm's national sales manager. "But as PCs have evolved and companies have come to rely on increasingly sophisticated software applications, the need for a more efficient, intuitive, and user-friendly interface has become much more important."

In a study conducted by the Department of Computer Science at York University in Toronto, the mouse was tested against a variety of other pointing devices under strict ISO 9241 standards. The results showed that mouse users are, on average, 91% more efficient in both speed and accuracy than when they use other pointing devices.

With the introduction of the Stainless Steel Mouse, Strongarm is able to bring this high level of speed and accuracy to the industrial plant floor environment. Its sleek, ergonomic design makes it a more user-friendly alternative to older, industrial-style pointers.

The Stainless Steel Mouse is constructed of 304 stainless steel and is NEMA 4X rated with a fully sealed, airtight design. This unique design provides superior wipe-down cleanability for pharmaceutical environments. In addition, the mouse can be completely submerged in water for more rigorous wash-down applications.

"A mouse makes our operators as effective as they can be; however, it must withstand rigorous chemical cleanings and sterilizations in the production environment, and Strongarm's stainless steel mouse meets production needs and survives this harsh environment reliably," said John Healy, a systems engineer at Merck & Co. "Over many years of service, I haven't had hardware failures with any Strongarm mouse."

Features:

- Completely sealed, cleanable and submergible.
- Optical technology with LogiTech optical sensor.
- Operates at temperatures from -20°C to 60°C.
- Sealed mechanical keys with 0.4 mm key travel.
- Specially designed mouse pads are integrated directly into your Strongarm system for optimal functionality.

The stainless steel mouse is another example of Strongarm's ability to draw from its large catalog of solutions to configure a system that's tailored to customers' specific interface needs. Other pointer options from Strongarm include the dura-point, micro-module, hula-point, trackball, and touchpad, as well as three different touchscreen technologies. The Stainless Steel Mouse is available on all Strongarm systems including the mini-station, suite-station, mini-console, wall station, and mobile stations.

Strongarm Designs
215.443.3400
Horsham, PA
www.strongarm.com

Peco Controls Introduces New LabelScan™ Inspection System

Peco Controls, introduces the new LabelScan™. This unique, camera-based label inspection system uses PC-Eyebot technology, which allows LabelScan to "learn" and store the correct label parameters for each product easily and quickly. With this "learned image," all the packages on the production line are compared for conformity and out-of-tolerance packages are automatically ejected from the line. LabelScan helps assure all packages meet product specifications.

LabelScan maximizes production flexibility. The system can be trained to inspect the full label area or focus on specific areas of the labeled package by defining the appropriate "region of interest." The criteria for defining a defect in each area and the accept/reject thresholds for each of those definitions can be set by the user. By allowing tolerance settings to be adjusted, the versatile LabelScan enables smaller defects to be either accepted or rejected, as determined by the packager.

LabelScan provides a complete solution. Each system includes camera, lighting, control enclosure, ejector timing, and ejector. By mounting the LabelScan camera on a rotary labeler platform, LabelScan provides a total look at each container label with inspection for skew (alignment), presence, correctness, tears, dog-ears and flags at speeds of up to 800 containers per minute.

The LabelScan operator console features a large display and includes the Peco Controls Multi-Trac Ejector Control for accurate ejection of out-of-tolerance packages. LabelScan includes an encoder input and timing sensors to assure proper tracking from the inspection to the ejection station.

LabelScan "learns" the proper image by depressing the "learn" button on the console. Selections for previously "learned" menu entries can also be selected through the keyboard entry supplied with the system.

LabelScan can be equipped with camera inputs selected for the application and inspects a broad range of container sizes. Alternative configurations allow for "front and back" (multiple label) inspection.

Peco Controls
Fremont, CA
510.226.6686
www.pecocontrols.com

New Temperature/Humidity Data Loggers with Ethernet/LAN Interface from TandD Corporation

The new TandD Corporation Model TR-71W and TR-72W thermo recorders are data loggers that incorporate an integrated Ethernet/LAN interface for monitoring both temperature and humidity. These capabilities allow for quick and easy collection of recorded data and monitoring of current conditions. The TR-71W can even send warning E-mails and text messages to cell phones.

Both of these units can be connected to a local area network through either a standard 10/100 Base-T Ethernet or through an 802.11b wireless LAN connection.

TandD has introduced a new powerful software tool which has been specially designed to use with a LAN to make settings for and carry out the automatic downloading of recorded data from TR-71W/72W loggers.

The TR-71W is a temperature data logger with a range of -40° to 110°C with optional sensors available with a range from -60° to 155°C.

The TR-72W is a temperature and humidity data logger with a range of 0° to 50°C and 10% to 95% RH.

TandD Corporation
518.669.9227
Saratoga Springs, NY
www.tandd.com

November 7-9, 2007 • Renaissance Hotel • Nashville, Tennessee

SQF International Conference

Consumer confidence in food safety has dropped dramatically. Join food safety professionals from around the world to learn how the Safe Quality Food (SQF) Program* offers a credible, cost-effective global solution to regain consumer trust.

Attendees will:

- Learn the importance of developing a food safety culture in a business and the benefits it will bring.
- Discover the latest developments in food safety certification, including food defense and social and environmental responsibility.
- Hear how to reduce food safety and quality management costs.
- Network with food safety professionals to share information and exchange ideas.

Who Should Attend?

- Supermarket and Foodservice Retailers
- Primary Producers and Food Processors
- Food Safety Training Centers and Certification Providers
- Food Safety Regulators
- Food Safety Educators

Don't miss your chance to learn about the next generation of food safety certification. Visit www.sqfi.com to register today!

Sponsorship and exhibitor opportunities are also available. For more information, call 202.220.0606 or email abondthorley@fmi.org.

The SQF Conference is proudly supported by EurepGAP, the Global Food Safety Initiative (GFSI), Food Quality Magazine, the International Association for Food Protection (IAFP) and the National Restaurant Association (NRA).

Special thanks to our conference sponsors, the American National Standards Institute (ANSI) and Silliker, Inc.

ANSI American National Standards Institute

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** The SQF Program, administered by the Safe Quality Food Institute, a division of the Food Marketing Institute (FMI,) is a food safety and quality management protocol designed specifically for the food sector.*

SQF INSTITUTE *is a division of* FMI FOOD MARKETING INSTITUTE

COMING EVENTS

NOVEMBER

- **1–2, International Dairy-free Conference,** London, United Kingdom. For more information, go to www.prosoy.org.
- **1–2, Detection Technologies 2007, New Developments in Identification of Microorganisms and Chemicals,** Hilton San Diego Resort, San Diego, CA. For more information, go to www.knowledgepress.com/events/6151420.htm.
- **3–7, APHA 135th Annual Meeting and Expo,** Washington, D.C. For more information, call 202.777.APHA (2742) or go to www.apha.org.
- **6–7, 2nd Annual International Conference for Food Safety/Quality,** San Francisco, CA. For more information, go to www.foodhaccp.com.
- **7–9, The Dairy Practices Council® Annual Conference,** Four Points Sheraton Hotel, Harrisburg, PA. For more information, call 732.203.1947; E-mail: dairypc@dairypc.org.
- **7–9, 2nd SQF International Conference on Food Safety Certification,** Renaissance Nashville Hotel, Nashville, TN. For more information, contact Amanda Bond-Thorley at 202.220.0606 or go to www.fmi.org.
- **8, Ontario Food Protection Association 49th Annual Meeting,** Mississauga Convention Centre, Mississauga, Ontario. For more information, contact Gail Seed at 519.463.5674; E-mail: seed@golden.net.
- **13–14, Dairy and Food Plant Wastewater Short Course,** University of Wisconsin-Madison, Madison, WI. For more information, call 608.263.1672 or go to www.cdr.wisc.edu.
- **20–21, Scientific Forum "From Safe Food to Healthy Diets,"** EC Charlemagne Building, Brussels. For more information, go to www.efsa.europa.eu.
- **22–23, ISO 22000 Food Safety Essentials,** Mississauga, Ontario, Canada. For more information, call 800.247.0802; or go to www.qmi.com.
- **28–29, Food Microbiology Conference,** Georgia World Congress Center, Atlanta, GA. For more information, go to www.campden.co.uk.
- **29–30, ISO 22000 Food Safety Internal Auditor,** Mississauga, Ontario, Canada. For more information, call 800.247.0802; or go to www.qmi.com.

DECEMBER

- **3–5, HTST Workshop, Randolph Associates, Inc.,** Mufreesboro, TN. For more information, call 205.595.6455; E-mail: Henry.Randolph@raiconsult.com.
- **3–5, Pflug's Microbiology & Engineering of Sterilization Processes Course,** Scanticon Conference Center, King of Prussia, PA. For more information, call Ann Nicholas at 434.263.4950 or go to www.drpflug.com.
- **4, British Columbia Food Protection Association Annual Meeting,** River Rock Conference Center, Richmond, British Columbia. For more information, contact Terry Peters at 604.666.1080; E-mail: terry_peters@telus.net.
- **5, Food Labeling Workshop, FDA-regulated Foods: Complying with Regulatory Labeling,** Washington, D.C. For more information, go to www.fpa-food.org.
- **10–11, SQF Training Course – Implementing SQF 2000 Systems,** Fayetteville, AK. For more information, call 202.452.8444 or go to http://fmi.org/events.

JANUARY

- **17–18, GMA Sustainability Summit,** The Ritz-Carlton, Washington, D.C. For more information, call 202.295.3950 or go to lcookson@gmabrands.com.
- **18–24, ILSI 2008 Annual Meeting,** Wyndham Rio Mar Beach Resort and Spa, Rio Mar, Puerto Rico. For more information, call 202.659.0074 or go to www.ilsi.org.
- **21–24, National Mastitis Council 46th Annual Meeting,** Marriott Riverwalk Hotel, San Antonio, TX. For more information, go to www.nmconline.org.
- **23–25, International Poultry Expo,** Georgia World Congress Center, Atlanta, GA. For more information, call 770.493.9401 or go to www.ipe08.org.

FEBRUARY

- **13–15, International Food Safety Conference,** Hotel Okura, Amsterdam, The Netherlands. For more information, call 33.1.44.69.84.84 or go to www.ciesfoodsafety.com.
- **23–27, AFFI Frozen Food Convention,** Sheraton San Diego Hotel & Marina, San Diego, CA. For more information, call 703.821.0770 or go to www.affi.com.

MARCH

- **12–15, FPSA 2008 Conference,** Hyatt Regency Coconut Point, Bonita Springs, FL. For more information, call 703.761.2600 or go to www.fpsa.org.

APRIL

- **9, SfAM 2008 Spring Meeting,** Aston University, Birmingham, UK. For more information, call 44.0.1234.326661 or go to www.sfam.org.uk.
- **27–30, 2008 ADPI/ABI Annual Conference,** Marriott Downtown, Chicago, IL. For more information, call 630.530.8700 or go to www.adpi.org.

IAFP UPCOMING MEETINGS

AUGUST 3-6, 2008
Columbus, Ohio

JULY 12-15, 2009
Grapevine, Texas

ADVERTISING INDEX

The Perfect Fit

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Visit http://careers.foodprotection.org

Many job seekers and employers are discovering the advantages of shopping online for industry jobs and for qualified candidates to fill them. But the one-size-fits-all approach of the mega job boards may not be the best way to find what you're looking for. **IAFP Career Services** gives employers and job seeking professionals a better way to find one another and make that perfect career fit.

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Visit http//careers.foodprotection.org today to post or search job listings in the food protection industry.

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* Asterisk indicates author for correspondence.

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The use of the Audiovisual Library is a benefit for **Association Members only.** Limit your requests to five videos. Material from the Audiovisual Library can be checked out for 2 weeks only so that all Members can benefit from its use.

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Des Moines, IA 50322-2864, USA
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- ❒ D1030 Cold Hard Facts
- ❒ D1031 Dairy Plant
- ❒ D1040 Ether Extraction Method for Determination of Raw Milk
- ❒ D1050 Food Safety: Dairy Details
- ❒ D1060 Frozen Dairy Products
- ❒ D1070 The Gerber Butterfat Test
- ❒ D1080 High-Temperature, Short-Time Pasteurizer
- ❒ D1090 Managing Milking Quality
- ❒ D1100 Mastitis Prevention and Control
- ❒ D1105 Milk Hauling Training
- ❒ D1110 Milk Plant Sanitation: Chemical Solution
- ❒ D1120 Milk Processing Plant Inspection Procedures
- ❒ D1125 Ohio Bulk Milk Hauling Video
- ❒ D1130 Pasteurizer: Design and Regulation
- ❒ D1140 Pasteurizer: Operation
- ❒ D1150 Processing Fluid Milk
- ❒ D1180 10 Points to Dairy Quality

ENVIRONMENTAL

- ❒ E2012 Better TEDs for Better Fisheries
- ❒ E3010 The ABCs of Clean – A Handwashing and Cleanliness Program for Early Childhood Programs
- ❒ E3020 Acceptable Risks?
- ❒ E3030 Air Pollution: Indoor
- ❒ E3031 Allergy Beware
- ❒ E3040 Asbestos Awareness
- ❒ E3055 Effective Handwashing – Preventing Cross-Contamination in the Food Service Industry
- ❒ E3060 EPA Test Methods for Freshwater Effluent Toxicity Tests (Using Ceriodaphnia)
- ❒ E3070 EPA Test Methods for Freshwater Toxicity Tests (Using Fathead Minnow Larva)
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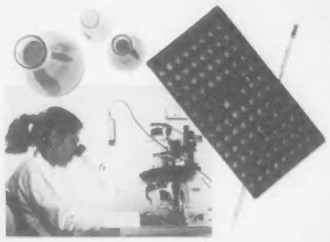

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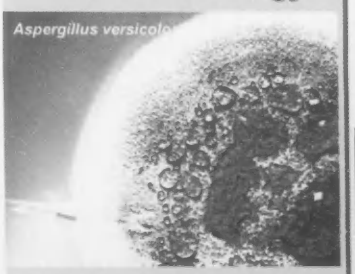

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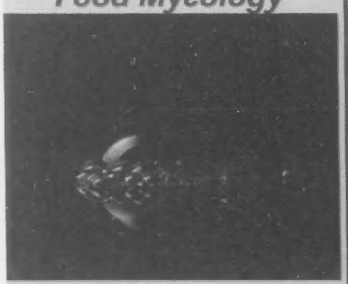

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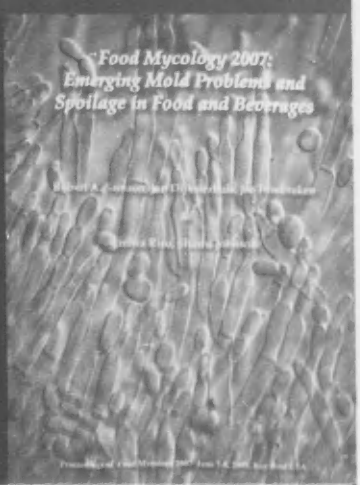

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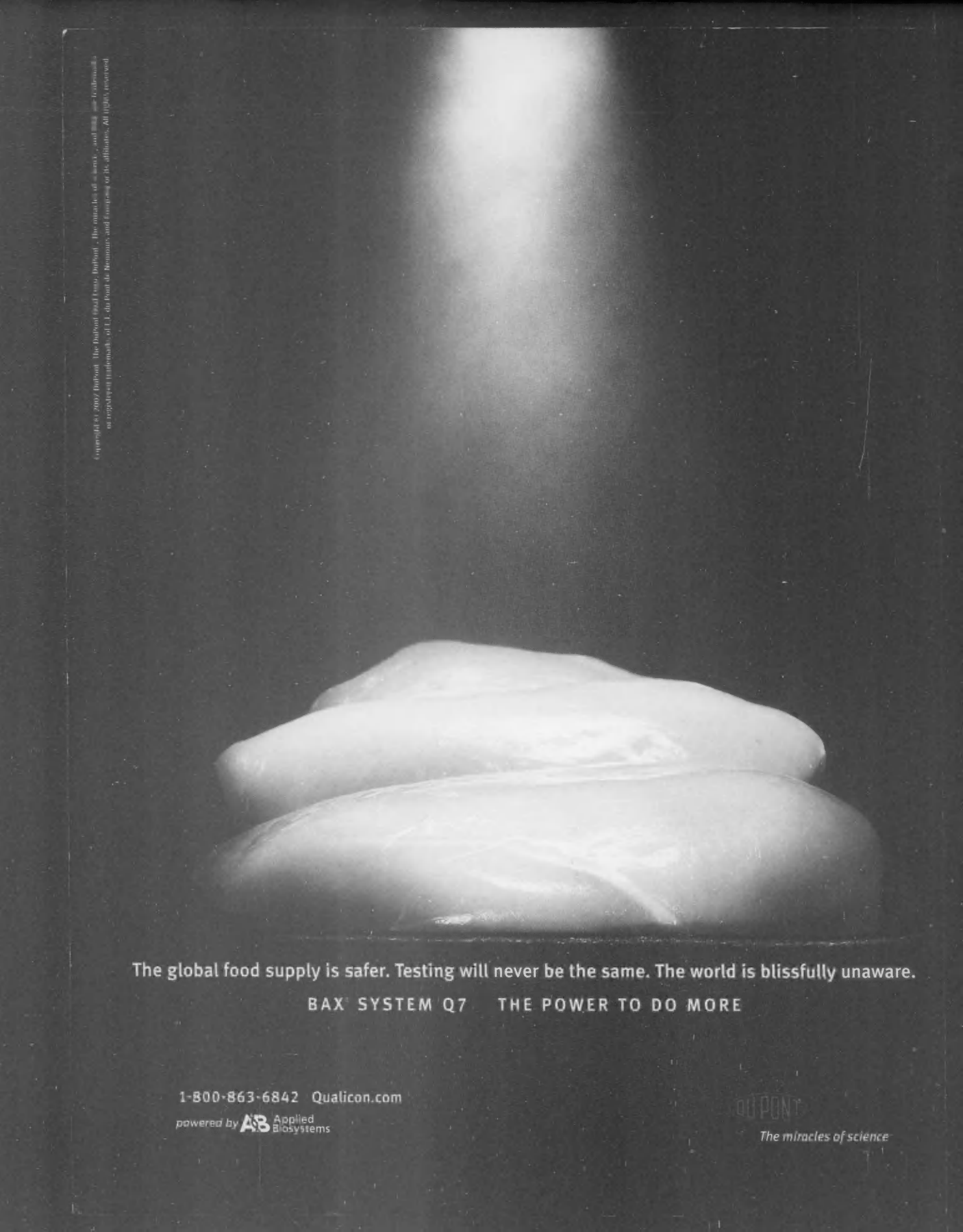
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