

FOOD PROTECTION TRENDS

SCIENCE AND NEWS

FROM THE
INTERNATIONAL ASSOCIATION
FOR FOOD PROTECTION

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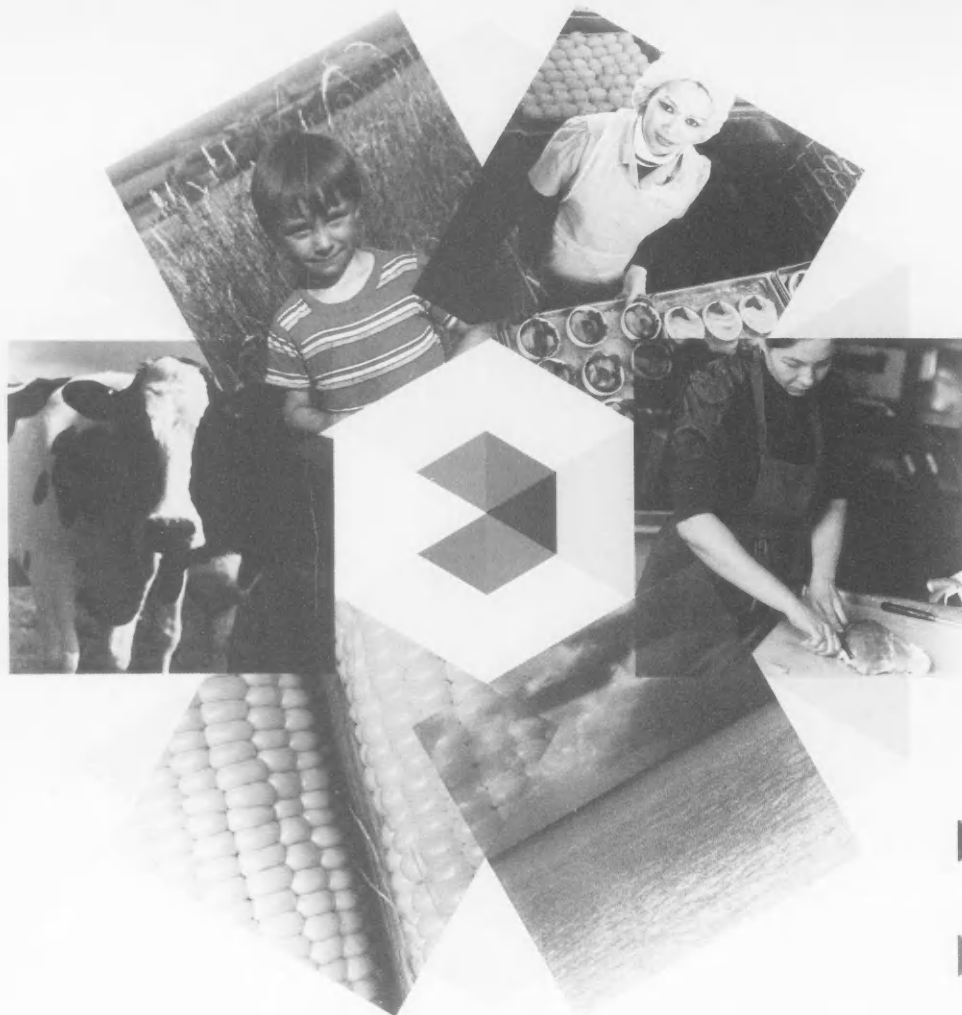
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VOLUME 23, NO. 7

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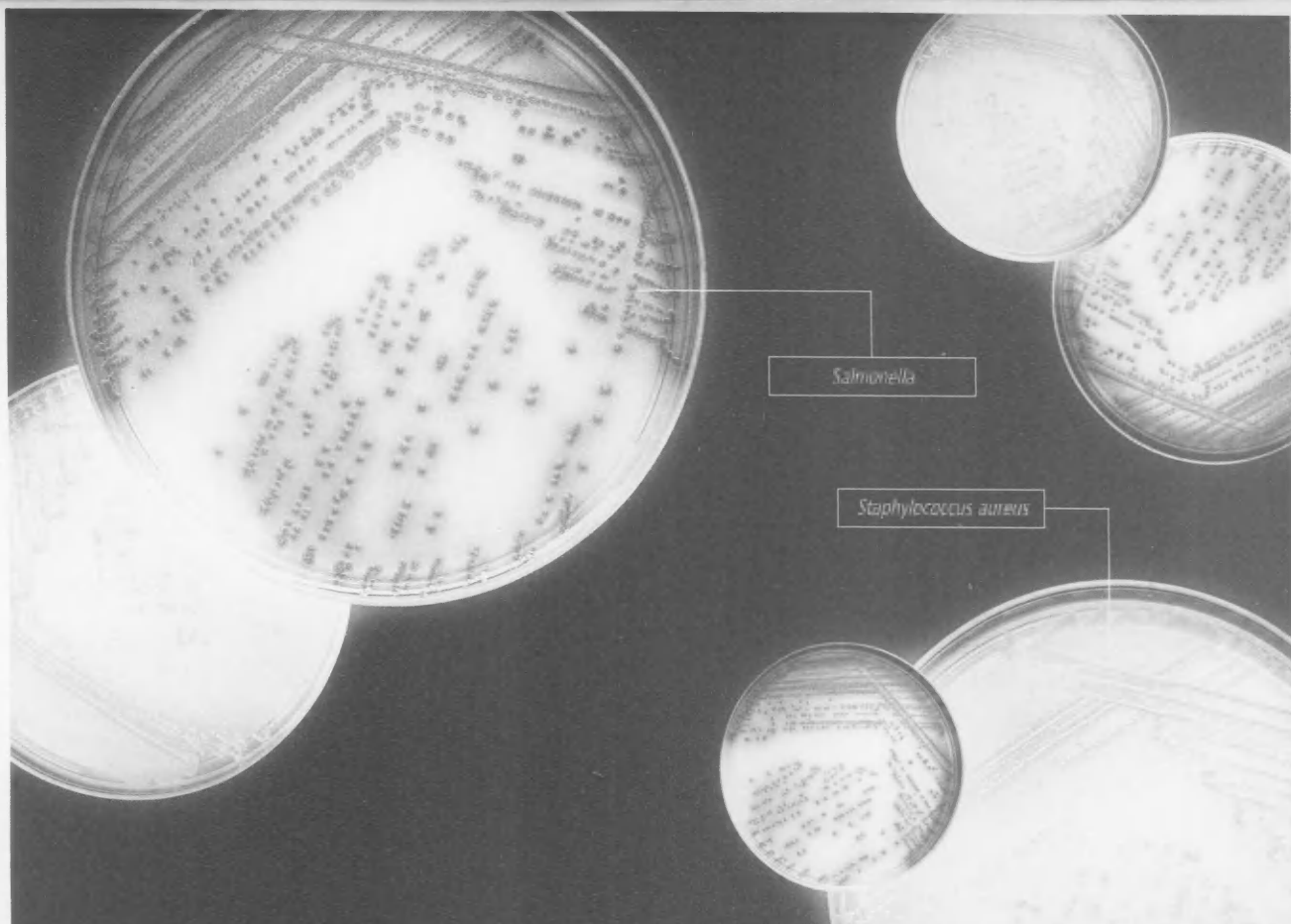
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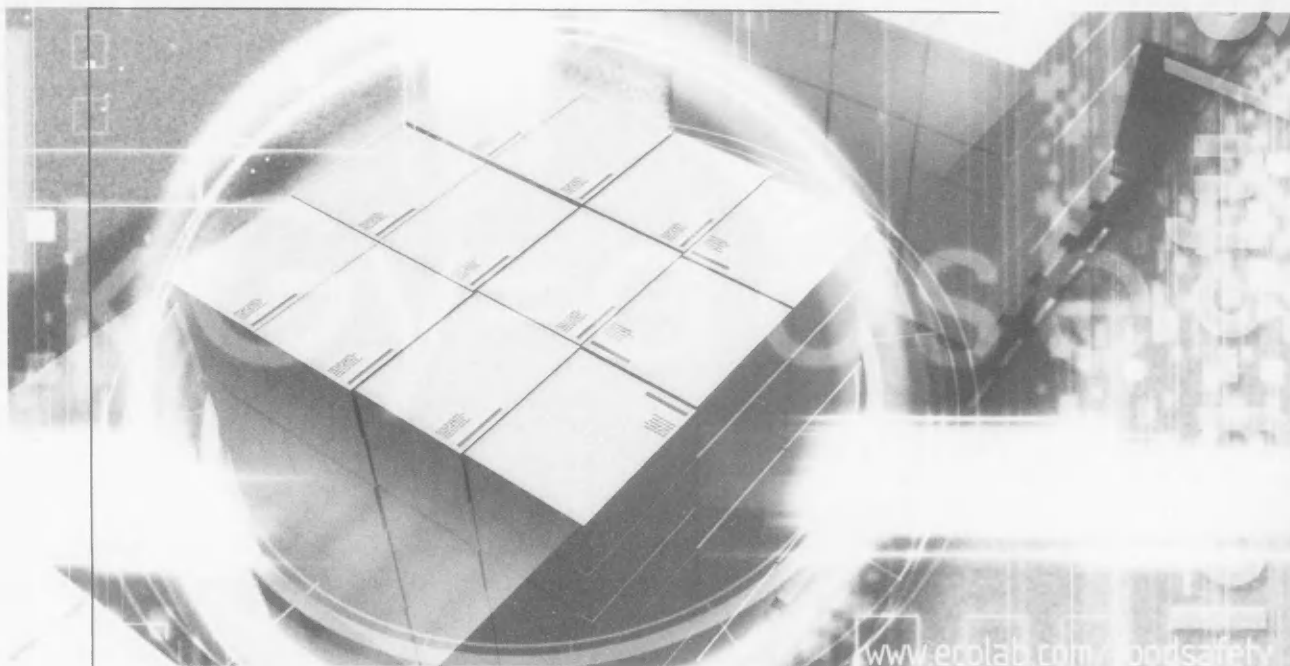
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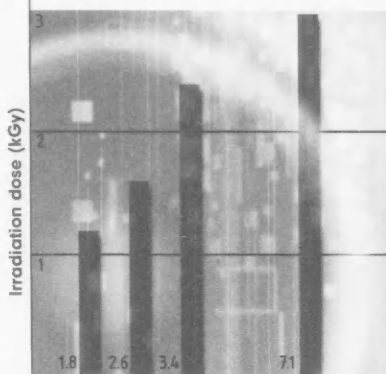
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"THOUGHTS" FROM THE PRESIDENT

"Science in a Tavern: Essays and Diversions on Science in the Making" is the title of a small book of essays, published in 1938, by Charles S. Slichter, Professor of Mathematics and, at some time, a Dean at the University of Wisconsin-Madison. I picked this up in a used bookstore on State Street in Madison some years ago. The first essay, from which the book's title comes, is about the beginnings of what was officially known as the Royal Society in England, but also generally and unofficially as the Royal Philosophers. The beginnings lie in a dining club of scientific men, including "...most of the distinguished scientists of Great Britain..." through all of the generations since the club began in 1650. Originally this convivial group met..."every Thursday afternoon, at the Bull-Head Tavern in Cheapside to eat and to experiment and to talk science".

Was this the origin of our modern day scientific conferences?

Perhaps not quite, but our conferences today still offer the opportunity to meet, boast about our science, debate and exchange ideas, and eat.

This month's issue of *Food Protection Trends* gives you a look at



By ANNA M. LAMMERDING
PRESIDENT

"New Orleans is an exciting place with much to offer IAFP Members and their families. We look forward to seeing you there!"

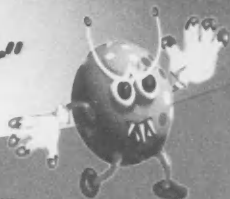
what awaits you at IAFP 2003, August 10 – 13, in New Orleans. I think it's an exciting program, beginning with Dr. Donald Zink's Ivan Parkin Lecture, "On the Trail of Food Safety – From the Early Days to the Future" (did it all start in a pub?). Dr. Elsa Murano, Under

Secretary for Food Safety, will give a Tuesday plenary session presentation on "Breaking the Cycle of Foodborne Illness: The War on Pathogens". Throughout the meeting there will be many timely and topical symposia, cutting-edge technical oral and poster sessions, and the Exhibit Hall will be packed with the latest in gizmos and gadgets for the lab and the production line. Before the Opening Session on Sunday evening, there are many opportunities to get involved ...workshops beginning on Friday; the New Member Reception on Saturday (old members are also invited to be part of this welcoming party!); an educational seminar and reception that will be of special interest to officers and delegates of all IAFP affiliates; Committee and Professional Development Group (PDG) meetings on Sunday. Everyone is welcome to attend these activities; come share your ideas, your expertise and your willingness to help your Association grow.

Of course, there will be time to socialize and see some of the sights of the city. New Orleans is an exciting place with much to offer IAFP Members and their families. We look forward to seeing you there!

"MAXIMIZE RISK MANAGEMENT"

--Says Germ "Buster"



FAMILY CIRCUS

By Phil Witte

I DON'T
SEE ANY
GERMS!



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to clean up his mess...

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he's got clean hands while
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"COMMENTARY" FROM THE EXECUTIVE DIRECTOR

New Orleans here we come! As you know, IAFP 2003 is coming right up and begins on August 10 in New Orleans. This will be the first time in the Association's history that we have met in New Orleans and we are looking forward to the new experiences that await us there. There is so much culture and history in the city of New Orleans. There are so many things to do and see to keep you busy in any spare time you can find or that will keep your traveling companions and family entertained during their stay in New Orleans.

We hope that you are planning to be with us for IAFP 2003 — the Association's 90th Annual Meeting. The program is fantastic and contains more than 500 presentations related to the science of food safety. There is nowhere else that you can go to receive this much concise, focused information on a broad range of subjects pertaining to food science! We are genuinely proud of this fact.

In addition to the exciting program content, we have many opportunities for your socializing pleasure. We begin on Saturday afternoon with the New Member (and first time attendee) Reception. Everyone is welcome to attend. This is an informal time to get to know other active people in the Association and to learn about IAFP's Committee and Professional Development Group (PDG) structure. Our Affiliate Educational Reception is also held on Saturday. It is designated for Affiliate Delegates and Officers and is designed to provide information that leads to improvement of our Affiliate organizations.

The Committee meetings on Sunday offer an occasion for everyone interested in food science and safety to become engaged at the "grass-roots" level. Our PDGs meet to plan symposia for the next year's Annual Meeting, so this is the place to begin your long-term involvement with IAFP. One specific PDG should be of interest to every Student Member of IAFP and that is, of



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

***"There is nowhere else
that you can go
to receive this much
concise, focused
information on a broad
range of subjects
pertaining to food
science!"***

course, the Student PDG. The student group organizes a luncheon on Sunday that is open to all Student attendees. It is an excellent way to meet fellow colleagues and establish life-long relationships!

Sunday evening at 7 p.m., the Opening Session begins the 90th Annual Meeting. Our Cheese and Wine Reception sponsored by Kraft Foods follows from 8 p.m. to 10 p.m. The reception is held in the Exhibit Hall and is a wonderful opportunity to meet and greet friends, both old and new, and it offers the occasion to visit with our exhibitors in an informal, relaxed setting.

Monday after the sessions, plan some time to stop in the Exhibit Hall for the Reception sponsored by DuPont Qualicon. We will have food and drink

available to tide you over until the Monday Night Social. This reception allows for interaction between attendees and with our exhibitors.

Monday Night's Social at Mardi Gras World is one event that you absolutely cannot miss. This will be so much fun to visit the site where most Mardi Gras floats begin. Blain Kern's Mardi Gras World is a work in progress, literally. You will see artists working on floats, stage props, movie set pieces and maybe even sculpted characters made for Walt Disney World attractions. Some of the floats are forty-feet long or longer! We want to extend our sincere thanks to IGEN International for their sponsorship of this event.

Tuesday evening we have arranged for a dinner and jazz cruise on the Creole Queen Paddle-wheeler. Purchase of tickets for this event helps to support the IAFP Foundation whose monies directly sustain the many projects sponsored by the Foundation. This will be an opportunity to see New Orleans in a unique way and enjoy some good Dixieland Jazz.

Our final social event is the Awards Banquet held on Wednesday evening. This is a time to gather to honor and recognize the 2003 Award recipients and their accomplishments. It is an excellent way to conclude the Annual Meeting and serves as encouragement to others to do their best and contribute to IAFP during their careers.

One last item I want to mention is our daytime tours. On Sunday we have the New Orleans Super City Tour, Monday is a Swamp & Bayou Tour, Tuesday is our River Road Plantation Tour and on Wednesday, don't miss the New Orleans School of Cooking Tour. Descriptions of these tours and our evening events are shown on page 612.

There you have it — a short summary of IAFP 2003. If you can only attend one conference per year, make it IAFP 2003 to keep up-to-date on issues in food science and safety. We hope to see you in New Orleans next month!

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Listeria monocytogenes Incidence and Distribution on a Selective/Differential Plating Medium in *Listeria*-Positive Environmental Samples from Ready-to-Eat Food Facilities

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SUMMARY

One thousand sixty-three environmental samples (sponges) from 9 meat, dairy, fish and bakery ready-to-eat food processing facilities were analyzed for *Listeria*. The ratios and distribution of *Listeria monocytogenes* to non-*L. monocytogenes* were determined by use of the chromogenic *L. monocytogenes* plating medium (LMPM). LMPM differentiates among the *Listeria* spp. by detecting phosphatidylinositol-specific phospholipase C activity specific for *Listeria monocytogenes*/*L. ivanovii*. *L. monocytogenes* and *L. ivanovii* form turquoise colonies, whereas all other *Listeria* spp. produce white colonies with a blue tinge. *L. monocytogenes* confirmatory medium and acid production from rhamnose were used to rapidly differentiate *L. monocytogenes* from *L. ivanovii*, and all 136 turquoise colonies tested were identified as *L. monocytogenes*. Two hundred six samples were identified as *Listeria*-positive. On LMPM-positive plates, the ratios of *L. monocytogenes* to non-*L. monocytogenes* spp. were arranged into 5 categories on the basis of colony color. In the two distribution extremes, 34% of the *Listeria*-positive LMPM plates contained 100% non-*L. monocytogenes* *Listeria* and 23.3% contained 100% *L. monocytogenes* colonies, accounting for 57.3% of the total positive samples. Eighteen percent of the *Listeria*-positive LMPM plates contained a majority (> 75%) of white (non-*L. monocytogenes* *Listeria* spp.) and < 25% turquoise (*L. monocytogenes*) colonies, and on half these plates there were 10 or fewer turquoise colonies. Of the remaining distributions, *Listeria*-positive LMPM plates containing a majority of turquoise colonies (> 75%, compared with < 25% white *Listeria* spp. colonies) and plates with approximate equal proportions of *Listeria* turquoise to white constituted 15.5 and 9.2% of the total positive samples, respectively. Thus, a selective/differential plating medium capable of differentiating *L. monocytogenes*/*L. ivanovii* from varying concentrations of other *Listeria* spp. is a useful tool when *L. monocytogenes* is a minority component of the total *Listeria* present.

A peer-reviewed article

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INTRODUCTION

Of the six *Listeria* species, only *Listeria monocytogenes* and *Listeria ivanovii* have been established as pathogenic for mice, with the former species being the prevalent organism involved in cases of human listeriosis (5). Although it accounts for only 0.02% of all foodborne illnesses, listeriosis has a high mortality rate, approximately 20% (4). *Listeria* outbreaks have originated with many types of foods, including meat and dairy products, and have become a specific concern in ready-to-eat (RTE) meat and poultry products because these products usually require no additional cooking before being ingested. In food processing involving a cooking step at the plants, *Listeria* contamination of the final product results from environmental (direct and indirect food contact surfaces) contamination between the cooking and packaging steps (9). Because product testing may miss low levels of *Listeria* contamination as well as providing no information as to the source of contamination, environmental testing has generally been considered more desirable than end product testing (9).

Traditionally, *L. monocytogenes* procedures do not separate *L. monocytogenes* from other *Listeria* spp. until a final lengthy and costly identification scheme is applied (2, 5). The enrichment broths and selective plating media do not differentiate *L. monocytogenes* from the other *Listeria* spp. What requires clarification, however, is how the distribution and/or frequency of *L. monocytogenes* colonies present on a *Listeria* selective plating medium influences the probability of detecting *L. monocytogenes*.

In 1999, the development was reported of a selective/differential chromogenic *L. monocytogenes* plating medium (LMPM) for the specific detection of *L. monocytogenes* and *L. ivanovii* (which produce turquoise

colonies) versus all other *Listeria* spp., which produce white colonies with a blue tinge (8). The LMPM contains 5-bromo-4-chloro-3-indoxyl-myoinositol-1-phosphate, which detects phosphatidylinositol-specific phospholipase C (PIPLC) activity found in *L. monocytogenes* and *L. ivanovii* but not in other *Listeria* spp. In comparison with the traditional plating media, LMPM has been shown to be quite specific and sensitive for detecting *L. monocytogenes* in environmental samples (6, 8). Additionally, all turquoise colonies can be rapidly (4–6 h) differentiated as being either *L. monocytogenes* or *L. ivanovii*, by using *L. monocytogenes* confirmatory medium (LMCM) and on the basis of acid production from rhamnose (data not presented).

The objective of this investigation was to determine the incidence and distribution of *L. monocytogenes* and non-*L. monocytogenes* *Listeria* spp. present on LMPM in the *Listeria*-positive environmental samples from RTE food-processing facilities. These data make no connection between sites of *L. monocytogenes* contamination in the various facilities and possible product contamination, although such a connection has been established (7).

MATERIALS AND METHODS

Listeria analysis

Environmental samples were collected by use of the Whirl-Pak® "Speci-Sponge" environmental sampling bag (Nasco, Tampa, FL) by trained plant personnel over a 4-month period from 9 United States Department of Agriculture (USDA) and Food and Drug Administration (FDA) inspected plants producing RTE meat, dairy, fish and bakery products. Sponges were shipped to the laboratory chilled in Styrofoam coolers on the day of sampling and upon receipt were tested within

24 h. The origins of the samples and the times collected were unknown. Samples were labeled with only internal plant codes to maintain confidentiality. Two methods were used to isolate *Listeria*, depending on the plant: the Reveal *Listeria* Test System (Neogen Corp., Lansing, MI) and a modified FDA method (5). The Neogen method followed manufacturers' instructions, except that the buffered *Listeria* enrichment broth (Acumedia Inc., Baltimore, MD) presumptive positive tubes (unheated) were streaked on LMPM (Biosynth International, Naperville, IL), a chromogenic selective/differential plating medium. For the modified FDA method, 90 ml of *Listeria* enrichment broth (Acumedia Inc., Baltimore, MD) was added to each Whirl-pak® bag containing the sponge. The sponges were gently massaged for a minimum of 30 s and incubated at 30°C for 48 h. Each enrichment sample was streaked, by use of a calibrated sterile loop (10 µl), onto LMPM plates to insure a sufficient number of isolated colonies. All LMPM plates were incubated at 35°C for 48 h. If present, five white (with a blue tinge when examined from underneath the plate) and five turquoise colonies were picked and subjected to Gram staining, oxidase and catalase tests, and wet mount (tumbling) examination to confirm the presence of *Listeria*. In addition, the turquoise colonies were further identified as either *L. monocytogenes* or *L. ivanovii* by streaking onto a biplate containing LMCM (Biosynth International, Naperville, IL), a medium using α-D-mannosidase reaction and Becton Dickinson (Sparks, MD) purple broth base supplemented with 2% agar and 1% rhamnose (8). The biplates were incubated at 35°C for 4 to 24 h and were checked within as little as 4–6 h for acid production from rhamnose (yellowing around the bacterial streak) and/or fluorescence from the LMCM. Approximately 98% of *L. monocytogenes* strains are positive

TABLE 1. Categorical distribution of *Listeria monocytogenes* in 206 samples positive for *Listeria* from 1,063 environmental samples

Categories of <i>Listeria</i> -Positive Samples	Percentage Non- <i>monocytogenes</i> <i>Listeria</i> spp.-Positive Colonies on LMPM (White colonies)	Percentage <i>L. monocytogenes</i> Positive Colonies on LMPM (Turquoise colonies) ^a	Number (%) of Total Positive Samples/Category
A	100% White	0% Turquoise	70 (34.0)
B	> 75 % White	< 25% Turquoise	37 (18.0)
C	25–75% White	25–75% Turquoise	19 (9.2)
D	< 25% White	> 75% Turquoise	32 (15.5)
E	0% White	100% Turquoise	48 (23.3)

^a All 136 turquoise colonies displayed fluorescence on LMCM plates and/or produced acid from rhamnose, identifying them as *L. monocytogenes*.

for α -D-mannosidase and rhamnose fermentation, whereas *L. ivanovii* are negative (*I*). Either of these reactions must be positive to indicate the presence of *L. monocytogenes*. All 136 turquoise colonies were identified by the biplate method as *L. monocytogenes* (data not presented). One white (blue tinge) and turquoise colony per set of sponges were identified by use of Micro-ID *Listeria* kits (Remel, Lenexa, KS). The results of the Micro-ID kits and the biplates were in complete agreement.

Data analysis

LMPM-positive plates were categorized by quantifying the presumptive *Listeria* colonies based on color distribution as follows: 100% white with (blue tinge when examined from underneath the plate); < 25% turquoise/> 75% white; 25–75% turquoise/25–75% white; > 75% turquoise/< 25% white; and 100% turquoise. These categories show the percent range of *L. monocytogenes* on an LMPM plate compared with all other *Listeria* spp. White (no blue tinge) or non-white (yellow-orange) colonies that are not *Listeria*, as determined by colony morphology,

motility, and gram stain, did not contribute to the above categories.

RESULTS AND DISCUSSION

The results of this study are summarized in Table 1. Of the 1,063 environmental samples tested, 206 (19.4%) were positive for *Listeria* spp. resulting in a distribution of non-*L. monocytogenes* *Listeria* to *L. monocytogenes* colonies (no *L. ivanovii* identified by the biplate method) on the chromogenic LMPM. Depending upon the ratios of white colonies (non-*L. monocytogenes* spp.) to turquoise colonies (*L. monocytogenes*) on LMPM, and disregarding any non-*Listeria* colonies, the positive samples were arranged into the five categories (A-E) shown in Table 1. Of the two distribution extremes, approximately one-third (34.0%) of the *Listeria*-positive LMPM plates contained 100% non-*L. monocytogenes* spp. *Listeria* (Category A), whereas 23.3% contained 100% *L. monocytogenes* colonies (Category E). Thus, nearly 60% (57.3%) of the observed *Listeria*-positive environmental samples were accounted for by these two categories, whereas the remaining 42.7% of

the *Listeria* spp. positive samples (Categories B, C, and D) represented mixed populations of *L. monocytogenes* and non-*L. monocytogenes* *Listeria* spp. on LMPM. This 42.7% value for a mixed population of *Listeria* species in *Listeria*-positive samples suggests that ecological niches in food plants commonly contain at least one *Listeria* species besides *L. monocytogenes*. Of the 18% of *Listeria*-positive colonies in Category B, only 10 or fewer turquoise colonies were observed on 50% of the LMPM plates, indicating that *L. monocytogenes* colonies could be easily missed on a less differential medium (data not presented). Almost equal distributions of turquoise and white colonies on LMPM were observed in 9.2% of the positive samples (Category C), and plates containing a majority of turquoise colonies (Category D) accounted for 15.5% of the total positive samples.

Any ecological niche in a processing plant with relevance to *Listeria* product contamination of RTE food may contain no detectable *Listeria*, a single *Listeria* species, or a mixture of *Listeria* species (9). If a mixed *Listeria* population does occur in a sample containing *L. monocyto-*

genes, there is the possibility that *L. monocytogenes* could be outgrown during the enrichment steps (3), which would decrease the likelihood of its being detected. Therefore, the ability to differentiate *L. monocytogenes* from *L. innocua* (or other non-pathogenic *Listeria*) on a plating medium favors the detection of *L. monocytogenes*, as shown here, i.e., 42.7% of the *Listeria*-positive samples. Furthermore, with respect to plates in Category A (Table 1), where all the colonies on LMPM are white, the failure to isolate *L. monocytogenes* on these plates does not necessarily indicate its absence in the environmental sample, because *L. innocua* is capable of outgrowing *L. monocytogenes* in a mixed culture (3).

The conventional *Listeria* media (USDA [MOX] and FDA [PALCAM, LPM, and OX]) are based on the water-soluble product of esculinase activity that is positive for all *Listeria* spp. (2, 5). In these plating media, 5 or more (FDA) to 20 or more (USDA) suspect colonies must be picked for confirmation (2, 5) and the chances are great of missing *L. monocytogenes* if it is present at low levels (3). This problem is minimized when PIPLC activity unique to *L. monocytogenes*/*L. ivanovii* permits their direct isolation in the presence of other *Listeria* spp. on a chromogenic medium such as LMPM (6, 8), as is borne out by the data in Category B (Table 1). Combining LMCM and acid production from rhamnose allows turquoise colonies on LMPM to be

quickly identified as either *L. monocytogenes* or *L. ivanovii* (8).

CONCLUSION

During the isolation of *L. monocytogenes* from an environmental or food source, the distribution and frequency of *Listeria* spp. colonies on selective plating media can vary over a wide range, which can in turn influence the probability of identifying *L. monocytogenes*-positive samples. The application of chromogenic plating media such as LMPM differentiates pathogenic from non-pathogenic *Listeria*, allowing the incidence and distribution of *L. monocytogenes* in *Listeria*-positive samples to be easily determined and confirmed, particularly when this organism is present in low numbers and against a high background of non-*L. monocytogenes* *Listeria* colonies.

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A Novel Intervention for the Reduction of Bacteria on Beef Carcasses

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ABSTRACT

The Rinse & Chill™ Technology developed by MPSC, Inc., St. Paul, Minnesota involves the vascular transfer of a chilled solution of sugars and salts through the cardiovascular system. The solution removes most of the residual blood as it circulates throughout the carcass and drains. Rinse & Chill™ Technology is a process that ensures a consistent reduction in pH and internal temperature by vascular transfer of a chilled solution into the arterial/venous system and has been demonstrated to reduce significantly the number of microorganisms, particularly coliforms and generic *Escherichia coli*. Data collected from two separate commercial beef slaughtering facilities demonstrated reductions of a 40.3% ($n=180$; $P=0.039$) and 41.2% ($n=100$; $P=0.009$) for aerobic microorganisms on rinsed carcasses, compared to controls. More importantly, the two commercial facilities demonstrated reductions of 99.3% ($n=180$; $P=0.125$) and 67.8% ($n=100$; $P=0.002$) in coliforms on the rinsed carcasses versus the controls. One of the facilities also demonstrated an 83.7% ($n=100$; $P=0.0008$) reduction in generic *E. coli* on the rinsed carcasses versus the controls. This study demonstrates that the Rinse & Chill™ Technology provides a novel intervention for improving microbial control of contamination on bovine carcasses.

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INTRODUCTION

Because of increased consumer awareness and recent changes in the regulation of meat inspection, the meat industry has attempted to improve sanitary conditions and the microbiological status of meat in slaughtering and processing plants. In 1993, the "zero tolerance" policy, which requires knife trimming to remove all visible physical contamination from beef carcasses prior to washing and chilling (2), was enacted. Since 1996, the Pathogen Reduction/HACCP Act requires meat and poultry slaughter establishments to implement sanitation standard operating procedures (SSOPs) and a hazard analysis critical control point (HACCP) system (3). Microbiological performance criteria, with standards for generic *Escherichia coli* and *Salmonella*, as a means of verification of HACCP were also established. These regulations have led to more research into, and development and application of, meat decontamination technology, with the objective of helping the industry to meet or exceed regulatory requirements as well as providing consumers with a microbiologically cleaner and safer product (5).

Rinse & Chill™ Technology is an enhanced bleeding technique that involves vascular transfer of a chilled isotonic solution of approved common substances (sugars and salts) through the cardiovascular system of beef animals during slaughtering. The purpose of Rinse & Chill™ Technology is to lower pH and temperature earlier and more rapidly and to more thoroughly remove residual blood from the animal. The objective of this study was to demonstrate that Rinse and Chill™ Technology can provide a novel intervention for improving control of microbial contamination on bovine carcasses.

MATERIALS AND METHODS

Slaughter

Cattle were slaughtered humanely in each commercial facility. They were assigned randomly to two groups, control or rinsed. For this study, animals were slaughtered and rinsed on seven sampling dates in Plant X; in Plant Y, animals were slaughtered and rinsed on three sampling dates. Cattle to be rinsed through the vascular transfer of chilled solution in the arterial/venous system were bled by severing both jugular veins. When the bleeding was nearly completed, an incision was made in the left carotid artery, and a catheter was inserted into the artery for the rinsing process. The rinsing solution (MPSC, Inc., St. Paul, MN) consisted of a dilute mixture of sugars and salts in water. Control groups were bled using the traditional method.

Carcass sampling

Carcass sponge samples were taken either 2 hours (Plant X) or 24 hours (Plant Y) after carcasses were washed and placed in the coolers. Meat/Turkey Carcass Supply Kits from NASCO (Fort Atkinson, WI) were used to collect the carcass sponge samples, following the procedure described in the U.S. Meat and Poultry Inspection Regulation (3). Ten ml of buffer was used to hydrate a sterile sponge. After the sample area was swabbed with the sponge, another 15 ml of buffer was added to the sponge in the bag, to bring the total volume to 25 ml. Swabbing consisted of 10 horizontal strokes and 10 vertical strokes in the template area of the brisket, flank and rump. The carcass sponge samples were immediately refrigerated (< 4°C) until they were shipped overnight, in a Styrofoam insulated shipping container with freezer packs, to the laboratory.

Microbiological analysis

Aerobic plate counts (APC) were determined, using 3M™ Petrifilm™ Aerobic Count Plates (St. Paul, MN); coliforms and generic *E. coli* were enumerated, using 3M™ Petrifilm™ *E. coli* Count Plates. Each sample was stomached for 2 min. One millimeter of broth was then removed from the sample bag and placed onto the respective Petrifilm™ plate. The samples were plated in duplicate and the plates incubated at 37°C for 48 h.

Statistical analysis

All bacterial counts were converted to log₁₀ CFU/ml for statistical analysis. The statistical test used in this study was student's *t*-test (paired, two-tailed), with a significance level of $P \leq 0.05$. The calculations were performed with Microsoft® Excel Version 2002, statistical functions (Microsoft Corp., Redmond, WA).

RESULTS

Carcass sponge samples

The average aerobic plate counts and coliforms on beef carcasses from Plant X are shown in Fig. 1. For 180 beef carcasses (90 controls; 90 rinsed) that had been in the cooler for 2 h, carcass sponge samples showed that rinsing was associated with a 40.3% reduction in APC and a 99.3% reduction in coliforms. No generic *E. coli* were detected on either control or rinsed carcasses. The frequency of coliforms detection was 22/90 for controls and only 11/90 for the rinsed carcass samples (Table 1).

The average aerobic plate counts, coliforms and generic *E. coli* on beef carcasses from Plant Y are shown in Figure 2. For 100 beef carcasses (50 controls; 50 rinsed) that had been in the cooler for 24 h, carcass sponge samples demonstrated a 41.2% reduction in APC and a 67.8% reduction in

TABLE 1. Analysis of APC and coliforms from 2-hour-cooler sponge samples from Plant X over 7 sampling dates

APC	N	Av. Log ₁₀ CFU/cm ²	% Reduction	P value (95% = ≤ 0.05)	
Control	90	3.09			
R&C	90	2.86	40.3%		0.039

Coliforms	N	Av. Log ₁₀ CFU/cm ²	% Reduction	Frequency of coliforms	P value (95% = ≤ 0.05)
Control	90	1.99		22/90	
R&C	90	-0.155	99.3	11/90	0.125

TABLE 2. Analysis of APC, coliforms and generic *E. coli* from 24-hour-cooler sponge samples from Plant Y over 3 sampling dates

APC	N	Av. Log ₁₀ CFU/cm ²	% Reduction	P value (95% = ≤ 0.05)	
Control	50	2.76			
R&C	50	2.53	41.2%		0.009

Coliforms	N	Av. Log ₁₀ CFU/cm ²	% Reduction	Frequency of coliforms	P value (95% = ≤ 0.05)
Control	50	2.54		41/50	
R&C	50	2.05	67.8	31/50	0.002

Generic <i>E. coli</i>	N	Av. Log ₁₀ CFU/cm ²	% Reduction	Frequency of generic <i>E. coli</i>	P value (95% = ≤ 0.05)
Control	50	2.47		31/50	
R&C	50	1.68	83.7	16/50	0.0008

coliforms for rinsed carcasses, compared to controls. In addition, there was an 83.7% reduction in generic *E. coli*. The differences between the rinsed and control carcasses with respect to APC, coliforms and generic *E. coli* were significant, $P = 0.009$,

$P = 0.002$ and $P = 0.0008$, respectively. The frequency of coliforms detected was 41/50 on controls versus 31/50 on rinsed carcasses. The generic *E. coli* frequency was 31/50 for controls versus only 16/50 on rinsed carcasses (Table 2).

DISCUSSION

Contamination of beef carcasses occurs with the transfer, to the meat surface of material from the exterior of the live animal and/or from the environment (1). Consumer concerns

FIGURE 1. Log₁₀ average aerobic plate counts and coliforms on beef carcasses from Plant X after 2 h in cooler. N = 180 (90 control; 90 rinsed). A significant difference was seen for APC ($P = 0.039$) but not for coliforms. A 40.3% reduction in aerobic plate counts and a 99.3% reduction in coliforms was demonstrated between controls and rinsed carcasses

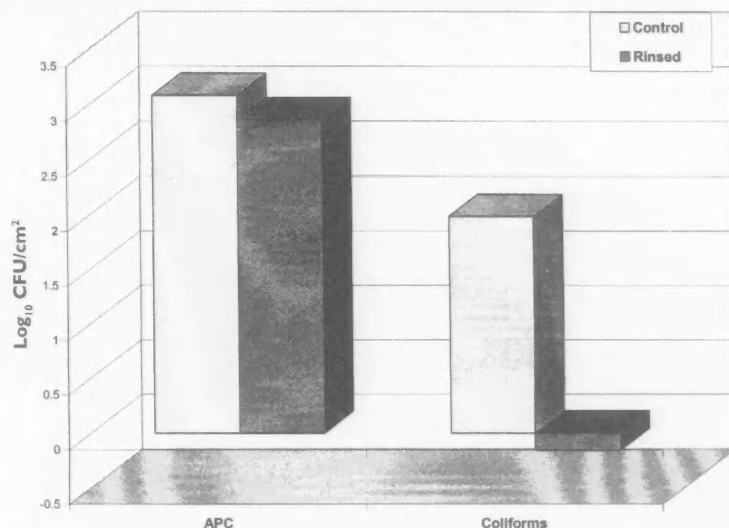
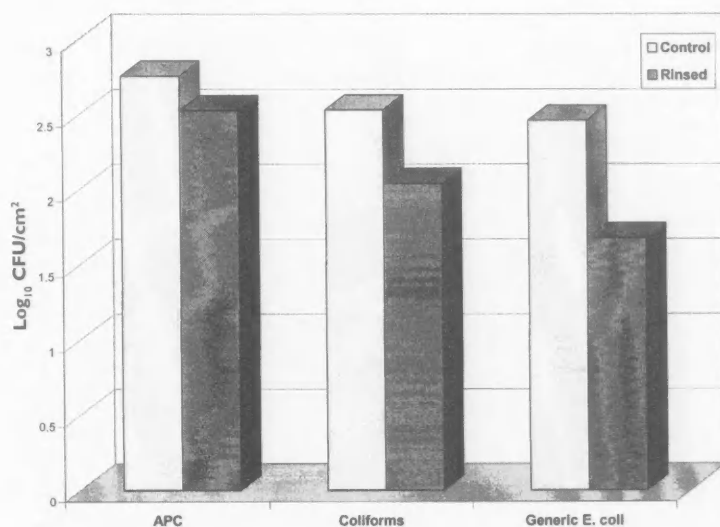


FIGURE 2. Log₁₀ average aerobic plate counts and coliforms on beef carcasses from Plant Y, comparing controls and rinsed carcasses after 24 h in cooler. N = 100 (50 controls; 50 rinsed). Significant differences between controls and rinsed carcasses were seen in APC, coliforms and generic *E. coli*, $P = 0.009$, $P = 0.002$ and $P = 0.0008$, respectively



over the safety of meat have mounted since 1993, when outbreaks caused by *Escherichia coli* O157:H7 and other microbial pathogens led to the initiation of new regulatory requirements by the USDA Food Safety and Inspection Service (3). Meat and poultry facilities must knife-trim carcasses to remove all visible fecal contamination, comply with written sanitation standard operating procedures, implement hazard analysis critical control point (HACCP) systems and meet microbiological performance standards for generic *Escherichia coli* and *Salmonella*, to verify the effectiveness of HACCP and pathogen reduction procedures within the plant. A variety of methods have been developed and implemented to reduce the presence of bacteria on beef and increase microbiological safety (4). These technologies include animal cleaning, spot cleaning of carcasses by knife-trimming or steam/hot-water vacuuming, and spraying/washing/rinsing of carcasses with water, chemical solutions and/or steam or hot water, before evisceration and/or before chilling.

The research presented here demonstrates the effectiveness of the Rinse & Chill™ Technology as a novel intervention for reducing bacterial populations on freshly slaughtered beef carcasses in two separate slaughter facilities. There was a statistically significant difference ($P = 0.039$ for Plant X and $P = 0.009$ for Plant Y) in aerobic plate counts when control and rinsed carcasses were compared. More importantly, there was a 99.3% reduction in coliforms in Plant X, as well as a 67.8% reduction in coliforms and 83.7% reduction in generic *E. coli* in Plant Y, in rinsed versus control carcasses.

It is important to note that even though other intervention methods (steam vacuum, steam pasteurization and lactic acid rinse), were in place in Plant Y post-intervention contamination occurred in the coolers, and

yet the Rinse & Chill™ Technology continued to provide protection. In fact, a recent study has demonstrated that Rinse & Chill™ Technology provides ongoing protection against the growth of coliforms and *E. coli* O157:H7 in vacuum-packaged and tray pack ground beef (unpublished data, Feirtag, et al.).

The mechanism(s) involved in Rinse & Chill™ Technology that contribute to its effectiveness as a novel intervention technology for reduction of bacteria on beef carcasses is currently being assessed. The reduction in pH and internal temperature of the carcasses, in addition to removal of the blood with the vascular transfer of the chilled solution, may provide

an unfavorable environment for growth and survival of bacteria. Also, Rinse & Chill™ carcasses allow for easier removal of hides, which may lead to less contamination on the surfaces of carcasses. In addition, there appears to be an antimicrobial effect of the solution itself. Further studies are being conducted to elucidate the mechanism of the protection afforded by the use of Rinse & Chill™ Technology on carcasses and further processed meat products.

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CALL FOR SYMPOSIA

IAFP 2004

AUGUST 8-11, 2004

PHOENIX, ARIZONA

The Program Committee invites International Association for Food Protection Members and other interested individuals to submit a symposium proposal for presentation during IAFP 2004, August 8-11, 2004 in Phoenix, Arizona.

WHAT IS A SYMPOSIUM?

A symposium is an organized, 3 1/2 hour session emphasizing a central theme relating to food safety and usually consists of six 30-minute presentations by each presenter and a 30-minute break. It may be a discussion emphasizing a scientific aspect of a common food safety and quality topic, issues of general interest relating to food safety and quality, a report of recent developments, an update of state-of-the-art materials, or a discussion of results of basic research in a given area. The material covered should include current work and the newest findings. Symposia will be evaluated by the Program Committee for relevance to current science and to Association Members. Proposals may be prepared by individuals, committees, or professional development groups.

SUBMISSION GUIDELINES

To submit a symposium, complete the Symposium Proposal form in its entirety. When submitting a proposal, the presenters do not need to be confirmed, only identified. Confirmation of presenters takes place after acceptance of your symposium.

SYMPOSIUM PROPOSAL DEADLINE

Proposals may be submitted by mail to the IAFP office for receipt no later than July 21, 2003 or by presenting the proposal to the Program Committee at its meeting on Sunday, August 10, 2003 in New Orleans, Louisiana.

The Program Committee will review submitted symposia. Organizers will be notified as to the status of their proposal by September 2003. Symposia will be accepted for further development or rejected. Accepted symposia are required to be finalized and sent to the IAFP office by January 7, 2004. The Program Committee has the final decision whether the finalized symposia will be accepted for presentation at IAFP 2004. The organizer will be notified of the final results by February 2004.

PRESENTERS WHO ARE NOT MEMBERS

International Association for Food Protection does not reimburse invited presenters for travel, hotel, or other expenses incurred during the Annual Meeting. However, invited presenters who are not Association members will receive a complimentary registration. Presenters who are Association Members are expected to pay normal registration fees.

ASSOCIATION FOUNDATION SPONSORSHIP

The International Association for Food Protection Foundation has limited funds for travel sponsorship of presenters. After formal acceptance of the symposium, symposia organizers may make requests in writing to the Program Committee Chairperson. Requests are reviewed on an individual and first-come-first-served basis. The maximum funding grant will be \$500 per symposium. Organizers are welcome to seek funding from other sources and the Association will provide recognition for these groups in our program materials. Organizers are asked to inform the Association if they obtain outside funding.

HAVE AN IDEA BUT YOU ARE UNABLE TO ORGANIZE IT?

Many Association Members have excellent suggestions for symposia topics, but are unable to organize the session. Such ideas are extremely valuable and are welcome. If you have an idea for a symposium topic, please contact Bev Corron. Symposia topics are among the most valuable contribution an Association Member can make to enhance the quality of our Annual Meeting.

WHO TO CONTACT:

Bev Corron
International Association for Food Protection
6200 Aurora Ave., Suite 200W
Des Moines, IA 50322-2864, USA
Phone: 800.369.6337; 515.276.3344
Fax: 515.276.8655
E-mail: bcorron@foodprotection.org

SYMPOSIUM PROPOSAL

IAFP 2004

AUGUST 8-11, 2004

PHOENIX, ARIZONA

Title: _____

Organizer's Name: _____

Address: _____

Phone: _____ Fax: _____ E-mail: _____

Topic – Suggested Presenter, Affiliation

(Example: 1. HACCP Implementation – John Smith, University of Georgia)

1. _____

2. _____

3. _____

4. _____

5. _____

6. _____

Suggested Convenors:

Description of Audience: _____

Signature of Organizer: _____

Submit by mail
by July 21, 2003 to:

International Association for Food Protection
Symposium Proposal
6200 Aurora Ave., Suite 200W
Des Moines, IA 50322-2864, USA

Submit in person
on August 10, 2003 to:

Program Committee Meeting
IAFP 2003, the Association's 90th Annual Meeting
New Orleans, Louisiana

or Contact:

Bev Corron
International Association for Food Protection
6200 Aurora Ave., Suite 200W
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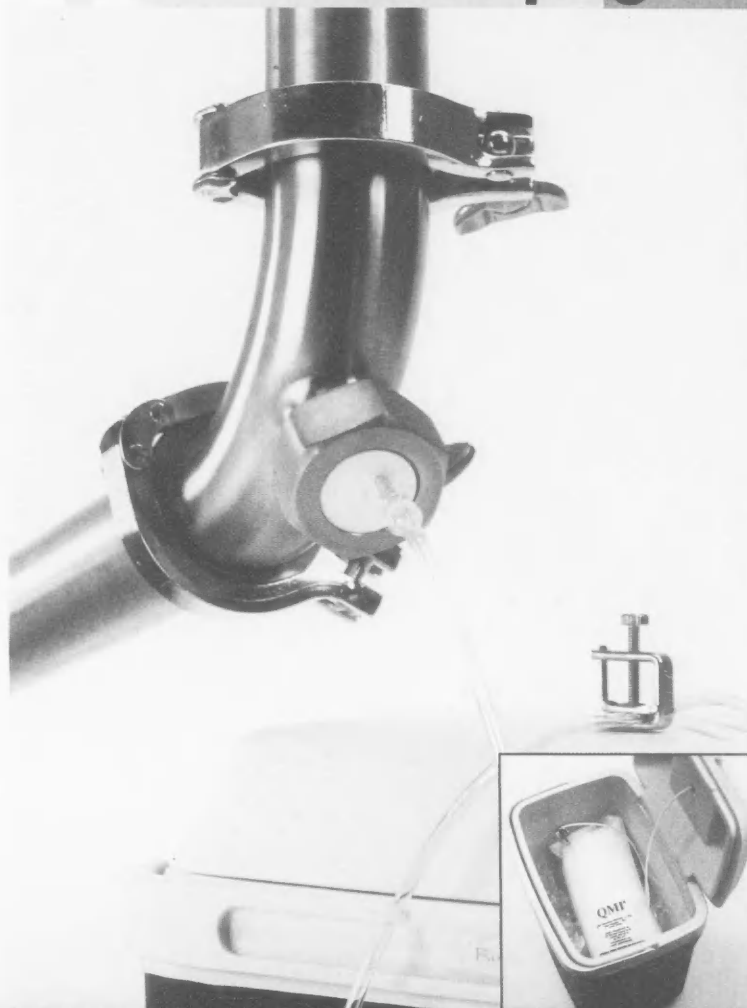
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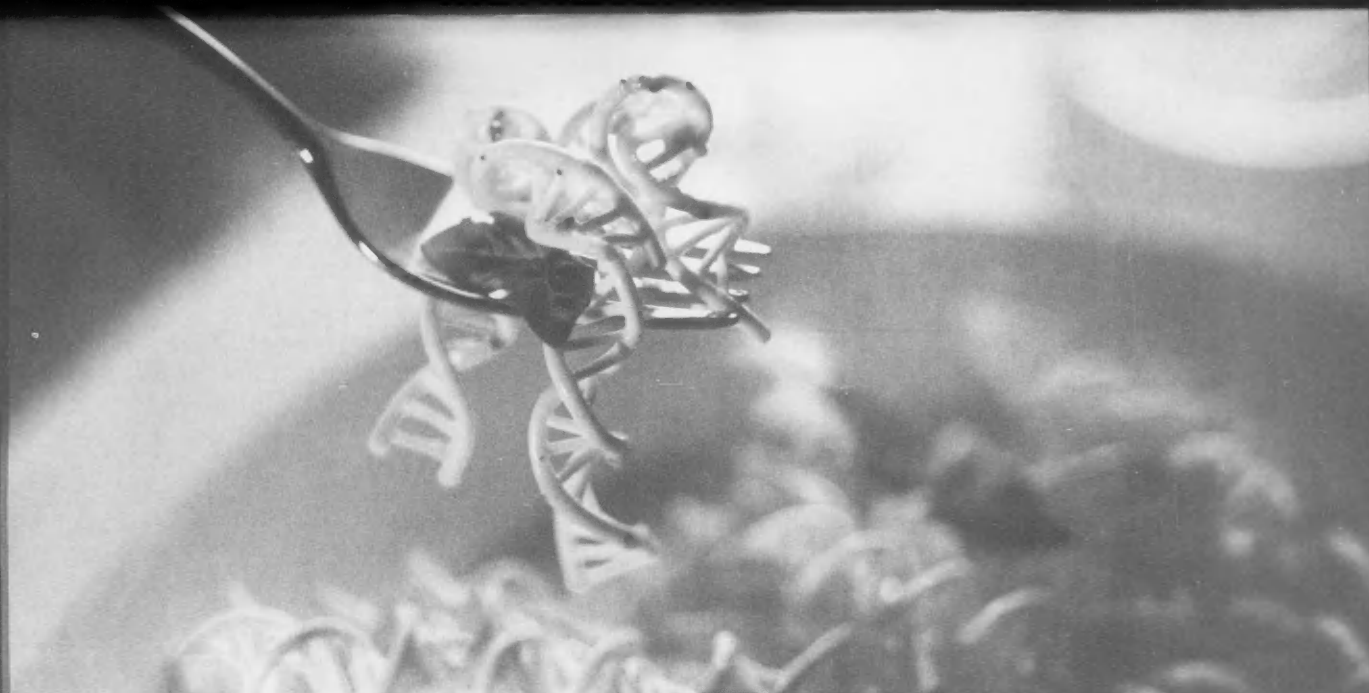
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Weetabix of Canada
Cobourg, Ontario

CROATIA

Marijana Sokolovic
HVI-Centar Za Peradarstvo
Zagreb

MEXICO

Laura Tobilla
LAB Microbiologia Agua Alimentos
Jacona, Michoacan

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UPDATES

Phillip Dale Smith Elected President of ADPI for 2003

Phillip Dale Smith of Leprino Foods has been elected president of the American Dairy Products Institute (ADPI).

Other elected officers for the 2003 term include: Richard Stammer, Agri-Mark, Inc., Lawrence, MA, vice president; Rick Kaepernick, Hilmar Cheese Company, Hilmar, CA, secretary; and Ken McMahon, Ellsworth Cooperative Creamery, Ellsworth, WI, treasurer.

Two ADPI members were also elected to their first term on the board of directors, Jim Kelleher, director of marketing and sales for Maple Island, Inc., and Greg Rexwinkel, vice president of the manufacturing division for Swiss Valley Farms.

Kelleher and Rexwinkel join nine other directors who were reelected with terms ending in 2006.

Michael Ely Retires after 29 Years with the Wisconsin Dept. of Agriculture, Trade and Consumer Protection

Michael F. Ely, food scientist specializing in dairy equipment and processes for the Wisconsin Department of Agriculture, Trade and Consumer Protection, has retired after 29 years with the department's food safety division. Ely started at WDATCP in 1974 as a dairy plant and farm inspector. Through the years he reviewed and evaluated dairy equipment and timed and sealed pasteurizers throughout Wisconsin. Ely was the department representative to the 3-A Committee on Sanitary Procedures and was active in the Dairy Practices Council; the Atlantic Midwest Equipment Review Committee; as well as a member of several associations including the Wisconsin Sanitarians Association.

Institute of Food Technologists (IFT) Names New Chief Executive

The Institute of Food Technologists announces the appointment of Barbara Byrd Keenan as executive vice president, replacing Daniel E. Weber who declared in February his retirement. Keenan's appointment received unanimous approval from the IFT executive transition team and concludes the international search for Weber's replacement.

Keenan, who most recently served as president of the Community Associations Institute in Alexandria, VA, will assume fully the responsibilities of IFT's executive office on August 7.

Prior to joining CAI, Keenan was executive vice president for the International Association of Hospitality Accountants.

County of Santa Clara Selected 2003 Crumline Award Winner

The County of Santa Clara, CA, Department of Environmental Health has been selected as the recipient of the 2003 Samuel J. Crumline Consumer Protection Award for Excellence in Food Protection.

The Crumline Award, named for one of the United States most renowned public health sanitarians, is presented to a local public health agency by a jury of leading environmental health officials and public health sanitarians. The Crumline Award is the most prestigious recognition that a public health agency can receive. Agencies that win the Crumline serve as models for other public health and safety programs across the nation.

"The innovative ideas that have been implemented in Santa Clara's program were extremely impressive," said Colin Thacker, director of environmental health at the Lake County, IL, Health Department and chair of the 2003 Crumline jury. "Innovation is one of the most important elements in an award-winning program because we recognize that departments throughout the country will look to incorporate these ideas within their own programs."

"The leadership at the Santa Clara Department of Environmental Health should be highly commended for their strategic planning initiatives, particularly their proactive – not reactive – approach to public health. They are truly forerunners in California and in the country," commented Thacker.

Santa Clara will receive the Crumline Award at the Annual Education Conference of the

National Environmental Health Association on June 8 in Reno. Award presentations will also be made at the annual meetings of the International Association for Food Protection in August in New Orleans and the National Association of County and City Health Officials to be held in Phoenix in September.

The Crumline Award is supported by the Conference for Food Protection, in cooperation with the American Academy of Sanitarians, American Public Health Association, Association of Food & Drug Officials, Foodservice & Packaging Institute Inc., International Association for Food Protection, International Food Safety Council, National Association of County and City Health Officials, National Environmental Health Association, National Sanitation Foundation International, and Underwriters Laboratories Inc.

Seasoned Industry Scientist Dave Gombas, New Vice President, NFPA-Safe Supplier Audits

David Gombas, Ph.D., has been named to head the National Food Processors Association's "Supplier Audits for Food Excellence," better known as the NFPA-SAFE Program. In this job, Gombas is responsible for the SAFE Program's development and implementation, including auditor training, audit reviews, program marketing and audit quality assurance.

Previously, Gombas was vice president of NFPA's Center for the Development of Research Policy and New Technologies, the

Association's research and investigative laboratory center in Washington, D.C. Gombas joined NFPA in 1998.

"Dave Gombas played an instrumental role in the critical early planning for the NFPA-SAFE Program, during which the food industry's top food safety and quality assurance experts designed the comprehensive audit that would meet the industry's audit needs across the board," said John R. Cady, NFPA's president and CEO. "Dave shared the vision for a comprehensive audit program with NFPA's leading processor members. There is no one better qualified to take the SAFE Program into its next phase of success."

The NFPA-SAFE Program allows suppliers to satisfy multiple customers with a standardized audit carried out by SAFE-certified, third party auditors. The SAFE audit is a comprehensive assessment of a company's entire quality and food safety system, covering five main categories: management responsibility, fundamentals, food safety systems, quality systems and regulatory compliance.

"After two years in operation, the NFPA-SAFE Program is off to a strong start and has achieved a successful launch," Gombas said. "Facilities have told us that the audit process is rigorous, but comprehensive, and they have found great value in the information they gain about their own quality systems – how they compare against the industry's perception of 'best practices,' and identification of any gaps in documentation or in-plant practices. Facilities have also begun to report the benefit of using their SAFE audit to replace additional audit requests from other food processors."



Prior to joining NFPA, Gombas served in microbiology and food safety departments at Campbell Soup Company and Kraft Foods. In 1993, he was research professor of food safety at the National Center for Food Safety and Technology, working with the US Food and Drug Administration to develop HACCP training courses for FDA investigators, and he co-authored the book HACCP Verification and Validation. He has BS and MS degrees in food science from Rutgers University (Cook College) and Massachusetts Institute of Technology, respectively, and a Ph.D. in food microbiology from the University of Massachusetts.

General Mills Microbiologist Katherine Swanson Wins NFPA Food Safety Award

Katherine M. J. Swanson, Ph.D., director, global product safety, General Mills, is the 2003 recipient of the NFPA Food Safety Award in recognition of her dedication and many contributions to improving food safety. Dr. Swanson will be presented the award at the Annual Meeting of the International Association for Food Protection, August 10–13, 2003 in New Orleans, LA.

Dr. Swanson has a distinguished record of accomplishment both in the private sector positions she has held during the past 20 years with General Mills and the Pillsbury Company, as well as numerous appointments to prestigious policy-making forums. She is well known and respected as an incisive speaker and cogent participant on the International Commission on Microbiological Specifications for Foods, the National Advisory Committee on Microbiological Criteria for Foods, and an Institute

of Food Technologists Scientific and Technical Panel on Potentially Hazardous Foods, among many others. In addition, she is a past chair of the Food Safety Committee of the American Frozen Food Institute and is chair of NFPA's Microbiology and Food Safety Committee. Recently she was appointed to the FDA Science Advisory Board.

Dr. Swanson is a microbiologist who is credited with the expert application of Hazard Analysis Critical Control Point and other approaches for managing microbial hazards in the food-processing environment. She is a leading expert in the understanding of microbial ecology and control of microorganisms in the processing environment, and the development and use of pathogen detection methodology.

Dr. Swanson earned her B.S. degree in dietetics from the University of Delaware, and her M.S. and Ph.D. degrees in food science from the University of Minnesota. Her accomplishments in food safety are also evident through 25 publications, book chapters, and her presence on the editorial board of the *Journal of Rapid Methods and Automation in Microbiology* and *Journal of Food Protection*.

In addition to her contributions to the broad food safety community, Dr. Swanson has provided innovative direction and leadership in the development and implementation of comprehensive food safety programs and training for research & development and quality regulatory operations groups within General Mills.

Quality Flow's Susan McKnight Named Merit Award Winner

Susan McKnight, vice president of Northbrook, IL-based Quality Flow, Inc., has been named a Merit Award winner by

the Water Quality Association (WQA). The announcement was made at the association's 2003 conference in Las Vegas, NV.

According to the announcement, Ms. McKnight received the honor because of her tireless dedication to the industry. Award of Merit winners are recognized for exceptional service to the water quality improvement industry and, specifically, for outstanding support of and commitment to an association program. Ms. McKnight, a certified water specialist, chairs the WQA's Certification Committee as well as serving on two other WQA committees, which includes Educational Services Committee and Water Quality Society. She is the chairperson for the Water Quality and Safety Professional Development Group of the International Association for Food Protection (IAFP) which addresses the role that safety and quality of water plays globally in the farm-to-table chain, and is a member of the editorial board of *Food Protection Trends*.

Irradiation Enhances Food Safety and Quality

Over 50 years of scientific research have established that the irradiation of foods to minimize foodborne illness and decrease waste is both safe and effective. Physicians and scientists associated with the American Council on Science and Health (ACSH) endorse the use of irradiation to enhance safety and supplement other food protection methods. These and other facts about food irradiation are spelled out in the latest (fifth) edition of *Irradiated Foods*, a revised booklet published by ACSH and updated by Paisan Loaharanu, M.S. (former head of the food and environmental protection section of the Joint Division of Nuclear Techniques



in Food and Agriculture of the FAO and IAEA, Vienna, Austria). The booklet explains the process of food irradiation, and provides answers to common consumer questions about it.

"It is important that consumers understand that food irradiation is a safe process," states Dr. Ruth Kava, director of nutrition at ACSH. "Irradiation does not make food radioactive any more than a dental X-ray makes teeth radioactive."

The Centers for Disease Control (CDC) estimate that if half of the ground beef, pork, poultry, and processed luncheon meats in the United States were irradiated, there would be over 880,000 fewer cases of foodborne illness, 8,500 fewer hospitalizations, 6,660 fewer catastrophic illnesses, and 352 lives saved every year. Irradiation can be used on foods in a number of ways. Typically, a low dose of radiation can be used to pasteurize foods such as meat, poultry, seafood, and spices in the same manner that heat is used to pasteurize milk, eliminating disease-causing organisms. Irradiation is meant to supplement—not replace—other methods of ensuring food safety.

The safety of food irradiation has been studied more extensively than that of any other food preservation process, including canning, freezing, dehydration, and the use of chemical additives. Just as processing foods by other means (such as broiling) can create minute amounts of new chemicals, so can irradiation—but there is no evidence that trace amounts of these chemicals are hazardous for human consumption. Nor does irradiation of food pose a risk to workers in irradiation plants or to communities in which irradiation plants are located.

Irradiation has been approved for various applications by over 50 countries worldwide, as well as by the World Health Organization, the Food and Agriculture Organization

of the United Nations, the American Medical Association, the American Dietetic Association, and the Institute of Food Technologists. As of March 2003, over 7,000 supermarkets and retail outlets in the US were selling irradiated ground beef. According to ACSH President Dr. Elizabeth Whelan, "Food irradiation is a most valuable addition to our arsenal in the war against food-borne illnesses. The American consumer has much to gain and nothing to lose from the wider application of food irradiation to our food supply." Consumers can learn more about irradiation in the new edition of ACSH's *Irradiated Foods*.

USDA Report Shows Cost of HACCP Implementation Seven Times Greater Than Estimated

The 1996 Pathogen Reduction/Hazard Analysis Critical Control Point (PR/HACCP) legislation has increased the meat and poultry industry's operational costs by about 1.1 percent, or more than seven times the original cost estimates, according to a report published by USDA's Economic Research Service (ERS).

The percentage increase in what ERS termed "controllable costs" — the cost of production inputs other than meat and poultry raw materials — ranged from 2.2 percent to as high as 5.5 percent.

The report, titled "Managing for Safer Food: The Economics of Sanitation and Process Controls in Meat and Poultry Plants," also reveals that the added sanitation and process control measures required by the PR/HACCP rule raised wholesale meat and poultry prices by about one percent.

Those added requirements, including mandatory microbial

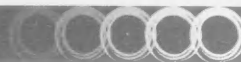
testing, were found to increase costs more in large plants than in smaller plants, the ERS report states. In fact, the report found that large slaughter plants that performed poorly on HACCP and sanitation tasks tended to exit the business, suggesting that meat and poultry companies in business today have made the investments necessary to fully comply with PR/HACCP requirements. The report can be accessed on the ERS Web site at <http://www.ers.usda.gov/publications/aer817/>.

New Vaccine to Fight Salmonella in Eggs

Developing an oil emulsion vaccine to reduce the possibility of *Salmonella* Enteritidis entering chicken eggs is the aim of scientists at the Agricultural Research Service Southeast Poultry Research Laboratory in Athens, GA. Immunologist Peter Holt, retired veterinarian Henry Stone and immunochemist Cam Greene have developed an oil emulsion vaccine of inactivated *S. Enteritidis* that protected hens exposed to the organism. Hens infected with *Salmonella* can transmit the organism into their eggs. People who eat infected eggs can get salmonellosis, a disease characterized by nausea, vomiting and severe diarrhea.

In studies at Athens, birds were vaccinated twice and then exposed to *S. Enteritidis*. The new vaccine reduced *S. Enteritidis* shedding in the birds' feces by 10 to 40 percent. A patent for the vaccine has been filed and is available for licensing.

The experimental oil emulsion vaccine is more effective than commercial vaccines because it boosts levels of antibodies that the hens produce to fight the infection, reducing *S. Enteritidis* inside their intestines. This, in turn, decreases the chance that the bacterium will



spread further through the birds' bodies, or that it will be shed in their feces.

An improved vaccine that reduces *Salmonella* shedding would be helpful to the poultry industry, since this is the primary method by which *Salmonella* infection spreads through a flock. Vaccinating poultry flocks against *Salmonella* is an important practice within the industry today. Approximately 25 million doses of *S. Enteritidis* vaccine are used annually in US poultry, while 50 to 75 million doses are used worldwide.

More information on the research is available in the May 2003 issue of *Agricultural Research* magazine, available on the World Wide Web at: <http://www.ars.usda.gov/is/AR/archive/may03eggs0503.htm>.

New Method to Accurately Identify Bacteria

University of Arkansas researchers have used a high-tech analytical tool to identify proteins in bacteria and have shown it to be faster and more accurate than other currently used methods. The research could lead one day to better diagnosis and treatment of diseases and to early detection of biological terrorism threats.

Charles Wilkins, distinguished professor of chemistry and biochemistry; Jack Lay, director of the Arkansas Statewide Mass Spectrometry Facility, and their colleagues reported their findings in a recent issue of *Analytical Chemistry*.

The most common way to identify bacteria involves isolating them, growing them and examining them under microscopes, but this method is time-consuming, sometimes taking weeks to produce an identification. After the anthrax

outbreak in 2001 when people were exposed to the deadly bacteria through contamination of mail, more researchers seriously began to study rapid methods of bacteria identification.

Many bacteria exist in both deadly and benign strains, so tests that identify bacteria must do so down to the strain level. Researchers hope to get at this level by looking at proteins within bacteria and finding proteins unique to each strain.

Researchers seeking to speed up and simplify the identification process started using a technique called matrix-assisted laser desorption/ionization mass spectrometry (MALDI-MS) to examine bacterial proteins in an attempt to identify bacteria from specific protein markers. This technique, called time-of-flight mass spectrometry (MALDI-TOFMS), relies on ionizing bacteria, shooting the particles down a tube and measuring the amount of time it takes to go down the tube, then calculating the masses using the time it takes particles of known mass to travel down the tube. Although the method works more rapidly than microscopy, it leaves a big margin for error, and often it cannot distinguish between specific proteins within the bacteria. "There are other things besides mass that can affect how long it takes a particle to go down the tube," Wilkins said.

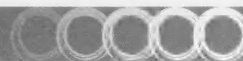
The researchers decided to compare the current method with a different type of MALDI called Fourier transform mass spectrometry (MALDI-FTMS)—a technique that Lay calls "the Cadillac of mass spectrometry." In this technique, a laser beam ionizes the bacteria, and the ions follow a circular path in a magnetic field, each one cycling at a specific frequency that is directly related to its mass and to the

magnetic field strength. The researchers can measure frequency with precision, which allows them to make accurate calculations of protein masses.

The investigators used *Escherichia coli*, a well-characterized bacteria that lives in the gut of humans and other animals and occasionally causes illness in humans. The *E. coli* genome, which codes for 4,300 proteins, has been mapped, and researchers can access information about these proteins in a computer database. Thus, they can compare the masses obtained through mass spectrometry techniques with the known information in the database and see how closely they correspond.

They found that the FTMS method had an error of 26 parts per million as opposed to an error of 200 parts per million for the time-of-flight method. Analyzing bacteria will continue to challenge researchers, because the organisms respond to their environment more rapidly than almost anything else in nature, Lay said. To offset this issue, researchers will need to reproduce the same conditions in studies each time.

Even if the mass spectrometry technique never becomes a standard diagnostic test, it could still prove useful to medical researchers. *E. coli*, like other bacteria, have both toxic and non-toxic strains. Wilkins and Lay hope to identify proteins that differentiate the benign and the disease-causing strains, and identify protein markers in antibiotic-resistant microorganisms. "The data produced from our studies may simplify other tests down the road," Lay said. Eventually, identifying protein markers in bacteria such as *E. coli* may allow medical researchers to focus on certain proteins involved in disease, leading to a new generation of antimicrobial medicines.



NFPA to Share Food Safety Expertise with Consumers, Media, Allied Organizations

The National Food Processors Association (NFPA) has launched a campaign to make its research and staff expertise available to help consumers get answers to their nutrition and food safety questions.

With NFPA's new campaign, the NFPA Consumer Partnership makes easy-to-digest information on current issues accessible to consumers through news media as well as trusted food and health professionals. These professionals include nurses who talk with patients, teachers who talk with students, school foodservice managers who talk with parents and grocers who talk with shoppers.

This outreach program builds on NFPA's current reputation as a "go-to" source for food companies and policymakers who have questions about food safety and nutri-

tion. NFPA is known as "The Food Safety People," and for good reason. More than 60 NFPA scientists — including 20 with Ph.D. degrees — work to make sure the best science is keeping the food supply safe. "Consumers have lots of important questions about the food they buy and serve their families. When consumers turn to the people they trust in their communities, the NFPA Consumer Partnership wants to make sure they get the answers they need," said Tim Willard, NFPA's vice president of communications.

NFPA is promoting the availability of Consumer Fact Sheets online at its consumer Web site, www.safefood.org. The Consumer Fact Sheets focus on issues that are generating attention among the media, consumers, educators and health professionals who have day-to-day contact with consumers.

Covering a host of topics including food safety, food allergies, food labeling and obesity, the Consumer Fact Sheets help consumers answer questions like these:

What should I know when a friend with food allergies comes to dinner? What is the difference between foods labeled as "natural" and "organic"? What are some steps I can take to prepare foods safely at home? How much physical activity is recommended in the Dietary Guidelines for Americans?

NFPA is encouraging the media, as well as food and health professionals, to make the most of the Consumer Fact Sheets available at www.safefood.org. To start, NFPA says make sure audiences know that www.safefood.org is available to everyone as a resource. NFPA also is promoting the availability of its expert staff for media interviews, and for discussion and information sharing with food and health professionals.

A logo for the NFPA Consumer Partnership is available for media use online at www.safefood.org.

NFPA serves as the voice of the food processing industry on scientific and public policy issues involving food safety, food security, nutrition, technical and regulatory matters, and consumer affairs.

In Memory of...

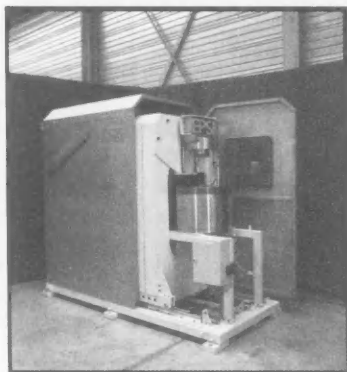
William Kempa
Manitoba, Canada

Dick B. Whitehead
Marietta, Georgia

IAFP would like to extend our deepest sympathy to the families and friends of William Kempa who passed away in August 2002 and Dick B. Whitehead who passed away April 2003. Mr. Kempa was a former president of IAFP in 1980 and Mr. Whitehead was president in 1971.

IAFP will always have sincere gratitude for their contributions to the association and the profession.

INDUSTRY PRODUCTS



Engineered Pressure Systems, Inc.

Engineered Pressure Systems, Inc. Offers Isostatic High Pressure Technology to the Food Processing Industry

EPSI has custom designed numerous food presses for universities, research institutes, and international food concerns. Available in laboratory and production units, EPSI's isostatic high-pressure systems deactivate microorganisms and enzymes, as well as denature proteins and polysaccharides.

Food processes using EPSI's high-pressure presses are designed to apply uniform, simultaneous and omnidirectional pressure to food products, and is ideal for meeting the high capacity demands of today's food industry and its requirements for easy and effective sanitation and cleaning of equipment. EPSI's non-thermal process subjects food products to high isostatic pressure, in the range of 100 to 900 Mpa at or

around room temperature. This process offers the food industry a unique opportunity to develop high nutritional foods of novel texture, higher safety, and sensory quality, while increasing shelf life. In addition, EPSI's high-pressure food processing enhances retention of natural flavors, fragrances and nutrients in foods.

Engineered Pressure Systems, Inc., Haverhill, MA

READER SERVICE NO. 275

High Speed Cross Feeders for Packaging Lines from Eriez

Eriez has introduced new high precision, cross feeders designed for use in food packaging applications. These high speed, high deflection and high volume vibratory cross feeders and conveyors distribute product into vertical, fill and seal (VFS) or weigh scale equipment using peripheral discharge trays capable of delivering from 100 to 1,000 cu ft of material per hour.

Eriez' HS (High-Speed) and HD (High Deflection) vibratory feeders featuring low energy, AC electromagnetic drives provide superior reliability, precise cycling and low operating cost. The high deflection series is recommended when feeding extremely lightweight materials where a higher angle-of-deflection (3/16") and lower frequency (30 cps) produces more accurate feed characteristics. Both HS and HD

series use the same AC drive enabling systems to easily cycle up to 100 times per minute.

Eriez' VMC Series Electromagnetic Conveyors use a two-mass vibrating system powered by one or more electromagnetic drives. Specially designed corrosion-resistant fiberglass springs amplify the stroke and are adjustable for easy fine-tuning of the conveyor's motion. They contain no sliding or rotating parts to wear out; or belts and bearings to fail. A variable voltage controller allows "watch-like" precision in the control of convey or amplitude. Units are available in base or suspension mounting.

Eriez' cross feeders use peripheral discharge trays made of food grade, stainless steel. Units can include screens to eliminate fines or damaged product during packaging.

Eriez Magnetics, Erie, PA

READER SERVICE NO. 276

Erea's New Generation of Isolators for Sterility Testing Minimizes Contamination Risks

Erea, which specializes in producing ultra-clean air equipment, has created the Flux Bulle®, a new generation of isolators for sterility testing. These isolators were designed for the pharmaceutical, chemical, medical, food processing, and high-tech industries as a response to the contamination risks that can lead to correctly manufactured batches being

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rejected, as well as to the dangers involved in the manipulation and disposal of sterilization materials. This new generation allows the performance of all these tasks to be optimized. The main objective is to reduce risks and costs while efficiently becoming an integral part of production process control flows.

A technical solution with low capital costs, Flux Bulle offers simple, small isolators that are completely empty and ventilated by a vertical, laminar airflow. They have smooth inside walls and rounded corners that are easy to clean. Isolators are decontaminated between tests by simple laminar airflow cleansing (ISO class 5).

Each isolator consists of three 4.3 inch Bioasafe® containers, labelled A, B and C. Container A, which has two male ports, is supplied empty and sterile. It is connected to the production unit in order to receive the sample flasks or vials to be tested. Using the second port, it is then connected to the isolator (the workstation), to which the samples are transferred. When tests are complete, it receives the samples that are to be transferred to an incubator. The container can then be disconnected and sent to the incubator or cut into several small heat-sealed sachets that will protect the samples from any cross contamination.

Container B has a single male port, but is crossed by a flexible tube of which the end is either clamped or taken to an empty recovery pouch. The flexible tube passes through a peristaltic pump, located outside the isolator.

Container C contains all the equipment, materials, and media needed to perform the test. The container and contents are pre-sterilized by irradiation. Since the container is standard, its sterilization is approved once and for all.

When tests are complete, equipment and materials simply have to be returned to the container, which is disconnected and sent to an incinerator if necessary. The empty work surface is then cleaned. When all operations are finished, the completely empty isolator is again ready for use.

This simple unit is easy to transport, and does not require any special equipment. It can be moved close to production units to reduce the time taken to transfer samples. With its low costs, practically zero risks, and significant time-savings (of more than four hours for some operations), the Flux Bulle meets all sterility testing needs.

Erea, Chicago, IL

READER SERVICE NO. 277

Aeromix Systems New Tornado Aerator Reduces Odor in University Test

The Tornado Aerator from Aeromix Systems, Inc., was found to significantly reduce odor in tests conducted by the University of Minnesota's College of Agriculture. Two 5-Hp Tornado Aspirating Aerators were installed in a wastewater lagoon at a large hog confinement facility in Southern Minnesota. The aerators were sized to provide an air cap or aerobic zone on top of the basin. The bottom remained undisturbed and anaerobic. This treatment method is used at municipal wastewater facilities and has proven to be very cost effective.

Odor and H₂S samples were taken monthly from the aerated basin and from a non-aerated basin of similar size and loading. The samples were taken over a one-year period. No samples were taken through the winter months. The odor samples were analyzed and rated by an odor panel at the University of Minnesota. When the

samples were compared, the aerated lagoon showed odors were reduced by as much as 75%. H₂S levels were as much as 90% lower than that of the non-aerated basin. Reclaimed water from the waste storage lagoons is used for flushing the barns. Reduced odors were also noticed inside the buildings.

Aeromix Systems, Inc.,
Minneapolis, MN

READER SERVICE NO. 278

Sigma-Aldrich Introduces New VenorGeM® Mycoplasma PCR Detection Kit and Mynox® Elimination Reagent

Sigma-Aldrich Corporation has introduced two new Mycoplasma products, VenorGeM Mycoplasma PCR detection kit for rapid and reliable detection of mycoplasma DNA in various in situ biologicals and Mynox Elimination Reagent for fast and efficient elimination of mycoplasma.

The new VenorGeM Mycoplasma PCR detection kit is highly sensitive, using as little as 1–5 fg of mycoplasma DNA, and can be completed within four hours. Results from this kit are easily determined with a "yes" or "no" response. Components of the VenorGeM Mycoplasma PCR detection kit include: 10X buffer reaction; primer sets and nucleotides at optimized concentrations; positive control for easy result verification; internal control to ensure accurate testing; instruction manual and storage box.

The Mynox Elimination Reagent, the first reagent that eliminates mycoplasmas by killing them, not just by inhibiting growth. Mynox is not an antibiotic; its activity is based on a biophysical mechanism, eliminating the development of resistant strains. Mynox is packaged

INDUSTRY PRODUCTS

with two premeasured sterile, single-use tubes allowing for two treatments.

Mycoplasma are known to cause a variety of human and animal diseases, and in the laboratory, mycoplasma are often found as common contaminants in cell cultures, virus stocks and other cell-derived biologicals. Mycoplasma contamination is a recurring problem that can cause non-reproducible results in research and productivity losses by 50% in industry, which can be avoided by routine diagnostic testing.

The VenorGeM Mycoplasma PCR detection kit incorporates the highly-sensitive PCR technology as its method for detecting contaminating mycoplasmas, which also offers outstanding characteristics over other techniques and products used for mycoplasma safety.

Sigma-Aldrich Corporation,
St. Louis, MO

READER SERVICE NO. 279



Thermo Orion

Thermo Orion Introduces the New AQUAfast® AQ4500 Turbidimeter Products for Low Level Turbidity Readings

The Thermo Orion AQUAfast AQ4500 Turbidimeter is ideal for use in either the lab or the field. The AQUAfast AQ4500 offers dual

light sources that allow readings to comply with either EPA 180.1 or ISO 7027. Measurements can range from 0 – 1000 NTU with a choice of units: NTU, FTU, FNU, ASBC, and EBC. The Thermo Orion AQUAfast AQ4500 conforms with the American Society of Brewing Chemists and European Brewing Chemists. It also complies with the EPA GLI method 2, in the range of 0 – 40 NTU. The AQUAfast AQ4500 has a datalog capacity of 100 points, which can later be downloaded to a printer or computer and typical battery life of over 1,000 hours. The Thermo Orion AQ4500 is truly IP67 waterproof and has excellent correlation with on-line turbidity instruments.

Thermo Orion, Waltham, MA

READER SERVICE NO. 280

Charm Gets US Approval of Rapid Test That Detects All Six Beta-lactam Drugs

Charm Sciences, Inc. recently announced the new Charm SL-6 Beta-lactam Test for raw milk which was approved by the NCIMS and recommended by the FDA.

This approval follows the performance-tested acceptance by the AOAC Research Institute, Charm Sciences said.

The SL-6 detects all six target drugs — Pencillin G, Ceftiofur, Cloxacillin, Cephapirin, Amoxicillin and Ampicillin — in a single test strip. According to Charm Sciences, a major advantage of this test is that it is the first time all six beta-lactam drugs can be detected by a single test where the test results are closest to FDA safe levels. The significance of this is the number of false violative positives that

associate with all tests is greatly diminished, Charm said.

In addition to accuracy and precision, Charm Sciences said the SL-6 is designed to be user-friendly with rapid results (eight minutes). The one-step assay uses ROSA (Rapid One Step Assay) technology. The approved test is based on the portable ROSA reader which allows real time display to printer or computer.

Charm Sciences, Lawrence, MA

READER SERVICE NO. 281

New NU-developed Food Allergen Tests Commercialized

The latest of several tests developed by University of Nebraska-Lincoln food scientists gives processors new tools to protect consumers with food allergies.

The newest test is for almonds, said Susan Hefle, a food toxicologist and co-leader of the university's Food Allergy Research and Resource Program. The team also recently improved on an egg test it developed several years ago. The new version detects cooked as well as raw eggs.

Neogen Corp. recently commercialized the almond and improved egg tests under a university licensing agreement. The company markets the new test kits along with those for peanut and milk protein to food processors.

The tests give processors quick, simple and accurate tools to check for traces of an allergenic food on manufacturing equipment or in food processed on shared equipment. Such cross-contamination is a major concern for food processors. "I feel that the food-allergic consumer is much better protected now because

INDUSTRY PRODUCTS

we have a better way to test than five or six years ago when we introduced the first tests," Hefle said.

The UNL developed tests can be done by processing plant workers in about 30 minutes. Before these tests were developed, processors often had to send samples to outside labs and wait several days for results.

"Food allergies have become increasingly important to consumers and companies alike," Hefle said. "Foodmakers need reliable tools to ensure their products contain only ingredients listed on the label. Recalls can sully a company's name and cost millions in recall and legal expenses. More people are allergic to foods these days; there's more media attention to the issue and a lot more regulatory attention," she said.

Initially, tests were used mostly to make sure processing equipment was properly cleaned. Testing since has expanded to examine all aspects of the manufacturing process, Hefle said, and has shown the need to check for contamination beyond the processing plant. "Tests have helped show that we have to be looking in other places besides the food processing plant for cross-contami-

nation. We have to go back further in the supply chain," she said.

For example, cross-contamination could occur when raw materials are stored or shipped or during initial processing. "When there's a recall, the company gets a black eye regardless of where contamination occurred," she said.

The NU Institute of Agriculture and Natural Resources team is an international leader in studying food allergies from a food industry perspective. The team works closely with industry, which helps researchers be sure they're tackling the most pressing allergy issues. The new egg test is a good example of the outcome. "After we developed the first egg test kit, we saw the problems manufacturers were having with cooked egg protein so we improved it," Hefle explained. "Industry feedback is really important because they're the ones who are using it."

All of the Nebraska tests are Enzyme-Linked Immunosorbent Assay, or ELISA, Hefle's specialty. Certain proteins are the culprits in allergenic foods and ELISAs use antibodies to spot them.

As part its ongoing food allergy research, the team thoroughly tests new ELISAs in the lab before they

are commercialized. Tests for other allergenic foods are in the works, including sesame, walnut, hazelnut, shrimp, pecans and soybeans.

University of Nebraska-Lincoln, Lincoln, NE

READER SERVICE NO. 282

Biotech Solutions' Molded Liners for Standard 96-Well Microplates

The new molded PTFE/Silicone or silicone only liners are designed for use in many of the round or square 96-well standard microplates. The liners have 96 round or square plugs that lock into each of the cylindrical or tapered wells. The tight seal eliminates sample cross contamination and reduces the chance of sample evaporation. The liners reseal after multiple injections, thus preventing coring and tearing. Our PTFE/Silicone liners offer superior chemical compatibility and are made from Teflon lined (not coated) medical grade silicone. The dark blue silicone liners are designed to withstand temperatures of -80°C. All of the liners are autoclavable and are available pre-scored for easy penetration.

Biotech Solutions, Inc., Mount Laurel, NJ

READER SERVICE NO. 283

Visit our Web site
www.foodprotection.org

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Committee Meetings

Sunday, August 10, 2003

TIMES	COMMITTEE MEETING	ROOM	FLOOR
7:00 AM-10:00 AM	Affiliate Council	Jasperwood	3rd
8:00 AM-5:00 PM	Communicable Diseases Affecting Man	Trafalgar	3rd
10:00 AM-12:00 PM	3-A Committee on Sanitary Procedures	Durham	3rd
10:00 AM-12:00 PM	Applied Laboratory Methods	Magnolia	3rd
10:00 AM-12:00 PM	Food Safety Network	Norwich	3rd
10:00 AM-12:00 PM	JFP Management	Oak Alley	3rd
10:00 AM-12:00 PM	Microbial Risk Analysis	Rosedown	3rd
10:00 AM-12:00 PM	Retail Food Safety and Quality	Elmwood	3rd
10:00 AM-12:00 PM	Viral and Parasitic Foodborne Disease	Warwick	3rd
12:00 PM-1:30 PM	Student	Versailles Ballroom	3rd
1:00 PM-3:00 PM	Dairy Quality and Safety	Magnolia	3rd
1:00 PM-3:00 PM	Food Sanitation	Elmwood	3rd
1:00 PM-3:00 PM	Foundation Fund	Durham	3rd
1:00 PM-3:00 PM	Fruit and Vegetable Safety and Quality	Rosedown	3rd
1:00 PM-3:00 PM	Meat and Poultry Safety and Quality	Oak Alley	3rd
1:00 PM-3:00 PM	Seafood Safety and Quality	Norwich	3rd
1:00 PM-3:00 PM	Water Safety and Quality	Warwick	3rd
2:00 PM-4:00 PM	FPT Management	Jasperwood	3rd
3:00 PM-4:00 PM	Constitution and Bylaws	Norwich	3rd
3:00 PM-5:00 PM	Audiovisual Library	Durham	3rd
3:00 PM-5:00 PM	Awards	Warwick	3rd
3:00 PM-5:00 PM	Nominating	Windsor	3rd
3:00 PM-5:00 PM	Outreach Education	Rosedown	3rd
3:00 PM-5:00 PM	Past Presidents'	Magnolia	3rd
4:00 PM-5:00 PM	Program	Elmwood	3rd



Award Winners

BLACK PEARL

*Sponsored by Wilbur Feagan and F & H Food
Equipment Company, Springfield, MO*

Wegmans Food Markets, Inc.
Rochester, New York

FELLOWS

Robert Gravani

HONORARY LIFE MEMBERSHIP

Randy Daggs
Lloyd Luedecke

HARRY HAVERLAND CITATION

Sponsored by Silliker Inc., Homewood, IL

Larry Beuchat

EDUCATOR

*Sponsored by Nelson-Jameson Inc.,
Marshfield, WI*

John Sofos

HAROLD BARNUM INDUSTRY

*Sponsored by Nasco International, Inc.
Fort Atkinson, WI*

Fred Weber

SANITARIAN

*Sponsored by Ecolab Inc., Food
and Beverage Division, St. Paul, MN*

None presented this year

MAURICE WEBER LABORATORIAN

Sponsored by Weber Scientific, Hamilton, NJ

J. Stan Bailey

INTERNATIONAL LEADERSHIP

Sponsored by Kraft Foods, Glenview, IL

Alex Von Holy

DEVELOPING SCIENTISTS

Sponsored by the IAFP Foundation Fund

To be determined

NFPA FOOD SAFETY

*Sponsored by The National Food Processors Association
Washington, D.C.*

Katherine Swanson

SAMUEL J. CRUMBINE

County of Santa Clara Dept. of Environmental Health
Santa Clara, California

AFFILIATE AWARDS:

C. B. SHOGREN MEMORIAL

Ontario Food Protection Association

BEST ANNUAL MEETING FOR AFFILIATES

Kentucky Association of Dairy, Food
and Environmental Sanitarians

BEST EDUCATIONAL CONFERENCE FOR AFFILIATES

Wisconsin Association for Food Protection

BEST COMMUNICATION MATERIALS FOR AFFILIATES

New York State Association for Food Protection

MEMBERSHIP ACHIEVEMENT FOR AFFILIATES

Highest Number Increase:

To be determined

Highest Percentage Increase:

To be determined

Dr. Elsa A. Murano

Under Secretary for Food Safety
United States Department of Agriculture

Plenary Session —

“Breaking the Cycle of Foodborne Illness: The War on Pathogens”

August 12, 2003 — 3:45 p.m. — 4:30 p.m.

New Orleans, Louisiana



Dr. Elsa A. Murano will deliver a special presentation during a plenary session on Tuesday, August 12 at IAFP 2003 in New Orleans, Louisiana. Dr. Murano is uniquely qualified to address the IAFP audience having obtained her doctorate in food science and technology from Virginia Tech and having held various faculty positions at both Texas A&M and Iowa State University for 10 years prior to her work with the United States Department of Agriculture. Time will be allowed for a question and answer period during the 45 minute plenary session.

Dr. Murano was sworn in as Under Secretary for Food Safety by Agriculture Secretary Ann M. Veneman on October 2, 2001. In this position, she oversees the policies and programs of the Food Safety and Inspection Service.

Dr. Murano has extensive public and private experience in the field of food safety as both a manager and educator. From 1995 until her swearing-in, Dr. Murano held several positions with Texas A&M University at College Station, Texas. Between 1997 to 2001 she served as the Director of the university's Center for Food Safety within the Institute of Food Science and Engineering. During this time she also served on the university's Department of Animal Science Research Advisory Committee and the Food Safety Response Team of the Texas Agriculture Extension Service, and served from 1999 to 2001 as the Chair of the Food Safety State Initiative Committee of the Texas Agriculture Experiment Station. She held the position of the Center for Food Safety's Associate Director from 1995 to 1997. In 2000 she was appointed Professor in the Department of Animal Science, after having been an Associate Professor in that same department from 1995 to 2000. In addition, in 2000 Dr. Murano was awarded the Sadie Hatfield Endowed Professorship in Agriculture.

Dr. Murano served as a Professor-in-Charge of research programs at the Linear Accelerator Facility at Iowa State University in Ames, Iowa from 1992 to 1995. She was an Assistant Professor in the Department of Microbiology, Immunology, and Preventive Medicine at that university since 1990.

Before joining the USDA, from 2001 until her appointment, Dr. Murano served as a member of the USDA National Advisory Committee for Meat and Poultry Inspection. Since 1998 she also served on the National Alliance for Food Safety Operations Committee, which she chaired during 2000. She was a member of several professional organizations, which included the International Association for Food Protection, American Society for Microbiology, the Association of Meat Science, the Institute of Food Technologists, and the Poultry Science Association.

A native of Havana, Cuba, Dr. Murano holds a B.S. degree in biological sciences from Florida International University in Miami. She also holds a M.S. degree in anaerobic microbiology and a Ph.D. in food science and technology, both from Virginia Polytechnic Institute and State University in Blacksburg, Virginia.

Iwan Parkin Lecture

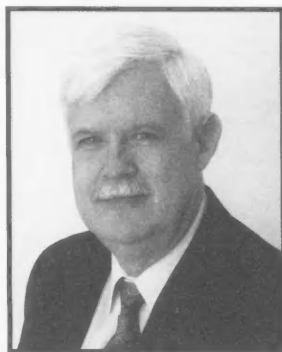
presented by

Donald L. Zink, Ph.D.

Lead Scientist, Food Processing
Food and Drug Administration
Center for Food Safety and Applied Nutrition
Office of Plant, Dairy Foods, and Beverages
College Park, Maryland

*"On the Trail of Food Safety —
From the Early Days to the Future"*

Sunday, August 10, 2003
Opening Session — 7:00 p.m.



Dr. Donald L. Zink received his undergraduate degree from Abilene Christian University. He earned an M.S. degree in Microbiology and a Ph.D. in Biochemistry and Biophysics from Texas A&M University. Between 1978 and 1983, he held faculty positions at Texas A&M University's College of Veterinary Medicine and at The University of Arizona in the Department of Microbiology and Immunology and the Department of Food Science. He joined Campbell Soup Company in 1983 as Manager of Process Microbiology where he worked in the area of refrigerated food safety and aseptic processing. In 1990, he joined

Nestlé, where he held various positions in Quality Assurance for the Carnation Company and later served as Director of Food Safety for Nestlé USA. In 2000, he joined a new beef processing venture company, Future Beef Operations, as Vice President of Research and Development and Product Safety. Recently, he joined the US Food and Drug Administration's Center for Food Safety and Applied Nutrition in the Office of Plant, Dairy Foods, and Beverages, where he serves as the Lead Scientist for Food Processing.

Dr. Zink has served as a member of several advisory committees including the Committee on Program and Technical Review of the US Army Natick RDEC for the National Research Council and the National Advisory Committee on Microbiological Criteria for Foods.

IAFP 2003 Preliminary Program



DSC - Developing Scientist Competition

Program subject to change

SUNDAY EVENING - AUGUST 10, 2003 7:00 p.m. - 8:00 p.m.

Opening Session

Presentation of the International Association for Food Protection Fellows Awards

Ivan Parkin Lecture - On the Trail of Food Safety - From the Early Days to the Future, Donald L. Zink, Ph.D., Lead Scientist, Food Processing, Food and Drug Administration, Center for Food Safety and Applied Nutrition, Office of Plant, Dairy Foods, and Beverages, College Park, MD, USA

Cheese and Wine Reception will follow in the Exhibit Hall

MONDAY MORNING - AUGUST 11, 2003 8:30 a.m. - 12:00 p.m.

S01 Use of Food Safety Objectives and Other Risk-based Approaches to Reduce Foodborne Listeriosis

Sponsored by ILSI N.A.

Organizer: Catherine Nnoka

Convenors: Michael Doyle and Isabel Walls

8:30 *Listeria monocytogenes* in Foods - An Update - PAUL S. MEAD, CDC, Atlanta, GA, USA

9:00 Use of Food Safety Objectives as a Tool for Reducing Listeriosis - ROBERT L. BUCHANAN, FDA-CFSAN, College Park, MD, USA

9:30 Factors Affecting Exposure of Individuals to *Listeria monocytogenes* - KATHERINE SWANSON, General Mills, Inc., Minneapolis, MN, USA

10:00 Break

10:30 Hazard Characterization Issues: Virulence, Pathogenicity and Modeling Dose-Response - CATHERINE W. DONNELLY, University of Vermont, Burlington, VT, USA

11:00 Process Control Strategies for Reducing Foodborne Listeriosis - DONALD L. ZINK, FDA-CFSAN, College Park, MD, USA

11:30 Education Strategies for Reducing Foodborne Listeriosis - LYDIA C. MEDEIROS, Ohio State University, Columbus, OH, USA

S02 Intervention Strategies for Ready-to-Eat Meat Products

Organizer: Margaret Hardin

Convenors: Peter Bodnaruk and Margaret Hardin

8:30 Food Safety Objectives for Ready-to-Eat Meat Products - BRUCE TOMPKIN, ConAgra Foods, Downers Grove, IL, USA

9:00 Facility Design and Sanitation Best Practices - DAVID HERWEYER, Wayne Chemical Co., Fort Wayne, IN, USA

9:30 Additive Intervention Technologies - KATHLEEN GLASS, University of Wisconsin-Madison, Madison, WI, USA

10:00 Break

10:30 Non-thermal Intervention Strategies for Ready-to-Eat Meat Products - LISA SZABO, Food Science Australia, North Ryde, NSW, Australia

11:00 Thermal Post Pasteurization Interventions for Ready-to-Eat Meats - HARSHAVARDHAN THIPPAREDDI, University of Nebraska-Lincoln, Lincoln, NE, USA

11:30 Irradiation of Ready-to-Eat Meat Products - Update and Future - KEVIN E. NANKE, SureBeam Corporation, Glendale Heights, IL, USA

S03 Hazard Identification in the Fresh Produce Industry

Organizer: Jennylynd James

Convenors: Jack Guzewich and Jennylynd James

8:30 Food Worker Hygiene in Fruits and Vegetables - EWEN TODD, Michigan State University, East Lansing, MI, USA and BARRY MICHAELS, Georgia Pacific Corp., Paltaka, FL, USA

9:00 On-Farm Survival of Indicators, Surrogates, and Pathogens - TREVOR V. SUSLOW, University of California, Davis, CA, USA

9:30 Clean Greens - A Field Study of the Microbiological Quality of Domestic Produce - LEE ANN JAYKUS, North Carolina State University, Raleigh, NC, USA

10:00 Break

- 10:30 Highlights of FDA Findings from Farm Investigations – JACK GUZEWICH, FDA-CFSAN, College Park, MD, USA
- 11:00 Survey of *Listeria monocytogenes* in Ready-to-Eat Vegetables and Use of the Data in Risk Assessment – YUHUAN CHEN, NFPA, Washington, D.C., USA
- 11:30 Information Needs for the Transportation and Distribution Component of a Produce Risk Assessment: Data and Models – MARK O. WALDERHAUG, FDA-CFSAN, College Park, MD, USA
- S04 Recipe for Food Safety at Retail**
Organizer: Frank Yiannas
Convenors: Ernie McCullough and Frank Yiannas
- 8:30 Mixing It All Together – A Retail Food Safety Overview – FRED REIMERS, H. E. Butt Grocery Company, San Antonio, TX, USA
- 9:00 Creative Recipes – Special Manufacturing Processes at Retail – STEVE OTWELL, University of Florida, Gainesville, FL, USA
- 9:30 New Ingredients – Retail Food Safety Innovations – FRANK YIANNAS, Walt Disney World, Lake Buena Vista, FL, USA
- 10:00 Break
- 10:30 Know Your Ingredients – Managing Allergens at Retail – ERNIE MCCULLOUGH, Triarc Restaurant Group, Fort Lauderdale, FL, USA
- 11:00 Changing the Recipe – How to Obtain a Food Code Variance – PETE SNYDER, Hospitality Institute of Technology and Management, St. Paul, MN, USA
- 11:30 Reading the Recipe – Training Workers Who Do Not Read English – JOSEPH EIFERT, Virginia Tech, Blacksburg, VA, USA
- T01 Microbiological Methods**
Convenors: David A. Golden and Robert C. Williams
- 8:30 Evaluation of Several Modifications of an Ecometric Technique for Assessment of Media Performance – Jeffrey L. Kornacki, JOSHUA B. GURTLE, Zhinong Yan, and Chad M. Cooper, University of Georgia, Griffin, GA, USA
- 8:45 Comparison of a Modified Plate Drop and a Solid Agar Overlay Method for Recovery of *Listeria monocytogenes* with Spread Plating and Spiral Plating Using Several Media – Zhinong Yan and JEFFREY L. KORNACKI, University of Georgia, Griffin, GA, USA
- 9:00 Comparison and Recovery of Airborne Microorganisms in a Swine Facility Using Selective Agar on Thin Agar Layer Resuscitation Media – BETH ANN CROZIER-DODSON, Daniel Y. C. Fung, and Joshua A. Reed, Kansas State University, Manhattan, KS, USA
- 9:15 Detection of Total and Pathogenic *Vibrio vulnificus* Using PCR and Oligonucleotide Microarrays – GITIKA PANICKER, Douglas R. Call, and Asim K. Bej, University of Alabama-Birmingham, Birmingham, AL, USA
- 9:30 Evaluation of Second Generation VIDAS® *Listeria monocytogenes* and Automated BAX® Methods for Detection of *Listeria monocytogenes* in Ready-to-Eat Meat and Poultry – WENDY A. LEPPER and Ann M. Schultz, Silliker, Inc., South Holland, IL, USA
- 9:45 Break
- 10:15 Validation of a Microwell DNA Probe Assay for Detection of *Listeria* spp. in Foods – OMAR A. OYARZABAL, Nicole M. Behnke, Gregory W. Durbin, Kathryn Telford, and Mark A. Mozola, Neogen Corporation, Lansing, MI, USA
- 10:30 Nucleic Acid Sequence-based Amplification for the Rapid and Sensitive Detection of *Salmonella enterica* from Foods – DORIS H. D'SOUZA and LeeAnn Jaykus, North Carolina State University, Raleigh, NC, USA
- 10:45 Multiplex Nucleic Acid Sequence-based Amplification to Detect Norwalk-like Viruses (GI and GII) and Hepatitis A Virus in Food Commodities – JULIE JEAN, Doris D'Souza, and Lee-Ann Jaykus, North Carolina State University, Raleigh, NC, USA
- 11:00 Rapid Enumeration of Yeast and Mold in Salad Dressings by Use of the BioSys – LORALYN H. LEDENBACH, Siobhan Ruff, Rozka Gabova, and Paul Hall, Kraft Foods, Glenview, IL, USA
- 11:15 Rapid and Specific Detection of *Penicillium expansum* by Polymerase Chain Reaction – PATRICK J. MAREK, Thirunavukkarasu Annamalai and Kumar Venkitanarayanan, University of Connecticut, Storrs, CT, USA
- 11:30 Nitrite-induced Injury of *Listeria monocytogenes*: Impact of Selective Versus Non-selective Recovery Procedures on Recovery from Frankfurters – C. M. NGUTTER and C. W. Donnelly, University of Vermont, Burlington, VT, USA

- 11:45 Pathogen Detection Using an Optical Interferometer Biosensor – Jie Xu, Carolyn Goodridge, and DAVID S. GOTTFRIED, Georgia Tech Research Institute, Atlanta, GA, USA
- P01 Pathogens and Their Controls**
10:00 a.m. – 1:00 p.m.
(Authors present 10:30 a.m. – 12:30 p.m.)
Convenors: Sudeep Jain and Justin Ransom
- P001 *Escherichia coli* and *Staphylococcus aureus* Inhibition with Ternary Mixtures of Thymol, Carvacrol and Potassium Sorbate – Reyna Leon-Cruz, Enrique Palou, and AURELIO LOPEZ-MALO, Universidad de las Américas-Puebla, Cholula, Puebla, Mexico
- P002 Origanox as a Natural Ingredient to Inhibit the Growth of Foodborne Pathogens – S.R.K. DHARMAVARAM, G. Shahbazi, C. W. Seo, and S. A. Ibrahim, North Carolina A & T State University, Greensboro, NC, USA
- P003 Use of Lactoferrin to Inhibit the Growth of Foodborne Pathogens and Meat Spoilage Bacteria – Anas Al-Nabulsi and RICHARD HOLLEY, University of Manitoba, Winnipeg, MB, Canada
- P004 Antimicrobial Activity of Cetylpyridinium Chloride against *Listeria monocytogenes* in Ready-to-Eat Meat – MANPREET SINGH, R. K. Phebus, H. Thippareddi, J. L. Marsden, and T. J. Herald, Kansas State University, Manhattan, KS, USA
- P005 Antimicrobial Effects of Colloidal Silver on Beef Inoculated with *Salmonella* spp. – R. R. COGER, R. K. Phebus, J. L. Marsden, and T. J. Herald, Kansas State University, Manhattan, KS, USA
- P006 Influence of EDTA on the Antimicrobial Efficacy of Thai Spices – CHITSIRI THONGSON, P. M. Davidson, W. Mahakarnchanakul, and P. Vibulsresth, University of Tennessee, Knoxville, TN, USA
- P007 Evaluation of Antimicrobial Packaging Materials and Modified Atmosphere Packaging for the Preservation of Foods – KAZUE TAKEUCHI and James Yuan, Air Liquide, Countryside, IL, USA
- P008 Antibacterial Effect of Black Seed Oil on *Listeria monocytogenes* – PRADEEP VASUDEVAN, Manoj Kumar Mohan Nair, and Kumar Venkitanarayanan, University of Connecticut, Storrs, CT, USA
- P009 Protamine's Antimicrobial Activity against *Escherichia coli* Depends Upon Cell Envelope Structure and Electrostatic Interactions – KRISTIN SLOAN, Lisbeth Truelstrup-Hansen, Chris Whitfield, and Heidi Schraft, University of Guelph, Guelph, ON, Canada
- P010 Inhibition of *Aspergillus flavus* by Sourdough Lactic Acid Bacteria – Marketa Giesova, LLOYD B. BULLERMAN, and Valerie Martinez, University of Nebraska-Lincoln, Lincoln, Nebraska, USA
- P011 Antimicrobial Activity of Selected Chemical Components from Essential Oils against *Salmonella* Typhimurium and *Listeria monocytogenes* – VALERIE W. LING, P. Michael Davidson, and F. Ann Draughon, University of Tennessee-Knoxville, Knoxville, TN, USA
- P012 Antimicrobial Activity of Potassium Sorbate and Phenolic Compound Mixtures – Angélica Santiesteban, Stella M. Alzamora, Enrique Palou, and AURELIO LOPEZ-MALO, Universidad de las Américas-Puebla, Cholula, Puebla, Mexico
- P013 Carvacrol, Citral, Eugenol, Potassium Sorbate, Sodium Benzoate, Thymol, and Vanillin Inhibitory Concentrations of *Zygosaccharomyces bailii* Growth Determined by Probabilistic Modeling – ENRIQUE PALOU and Aurelio Lopez-Malo, Universidad de las Américas-Puebla, Cholula, Puebla, Mexico
- P014 Shiga Toxin-Producing *Escherichia coli* in Nevada Sheep – HUSSEIN HUSSEIN, University of Nevada-Reno, Reno, NV, USA
- P015 A PCR-based Method for the Rapid Detection of the Genus *Listeria* and the Species *Listeria monocytogenes* in Food Products – Lilach Sommer and YECHEZKEL KASHI, Technion, Haifa, Israel
- P016 Biofilm Forming Potential of *Listeria monocytogenes* Isolates on Stainless Steel Using Two Different Media – JAMES FOLSOM and Joseph Frank, University of Georgia, Athens, GA, USA
- P017 Effect of Natural Antimicrobials on *Escherichia coli* O157:H7 in Refrigerated MAP Ground Beef – Parthiban Muthukumarasamy, Jung H. Han, and RICHARD A. HOLLEY, University of Manitoba, Winnipeg, MB, Canada
- P018 Activity of Dermaseptin Derivatives against Foodborne Pathogens – Shachar Oriel, Sima Yaron, Dina Shachar, and AMRAM O. MOR, Technion-Israel Institute of Technology, Haifa, Israel

- P019 An Exopolysaccharide, Colanic Acid, Production by Shiga-toxin-producing and Enterohemorrhagic *Escherichia coli* – Jui-Yueh Yeh, Joy Adams, and JINRU CHEN, University of Georgia, Griffin, GA, USA
- P020 Adaptation to Low pH Changes; Membrane Lipid Composition, Verotoxin Secretion, and Acid Resistance of *Escherichia coli* O157:H7 – HYUN-GYUN YUK and Douglas L. Marshall, Mississippi State University, Mississippi State, MS, USA
- P021 Effect of Ultrasonication and Sodium Chloride Concentration on Inactivation of *Escherichia coli* O157:H7 and *Listeria monocytogenes* – KIMBERLY D. STANLEY, David A. Golden, and Jochen Weiss, University of Tennessee, Knoxville, TN, USA
- P022 Comparison of Inoculation Method and Drying Time on Survival and Recovery of *Escherichia coli* O157:H7, *Salmonella*, and *Listeria monocytogenes* Inoculated onto Raw Tomatoes and Lettuce – MEGAN M. LANG, Linda J. Harris, and Larry R. Beuchat, University of Georgia, Griffin, GA, USA
- P023 Changes in the Acid Tolerance of *Escherichia coli* O157:H7 as Affected by Acid Adaptation Procedures – LAURA V. ASHTON, John Samelis, Patricia A. Kendall, and John N. Sofos, Colorado State University, Fort Collins, CO, USA
- P024 Comparison of Media, Incubation Time, Temperature, and Environmental Conditions on the Recovery of Heat-injured *Escherichia coli* O157:H7 in a Broth System – STACY K. STOLTENBERG, Kelly J. K. Getty, Randall K. Phebus, Hashavardhan Thippareddi, and Thomas M. Loughin, Kansas State University, Manhattan, KS, USA
- P025 Protective Effect of *Escherichia coli* O157:H7 Colanic Acid to Osmotic Shock and Oxidative Stress – JINRU CHEN and Shiao Mei Lee, University of Georgia, Griffin, GA, USA
- P026 Survival and Growth of *Escherichia coli* O157:H7 on Fresh Beef Inoculated Before and After Decontamination with Hot Water and Lactic Acid in Different Sequences – KONSTANTINO P. KOUTSOUMANIS, Laura V. Ashton, Ifigenia Geornaras, Patricia A. Kendall, and John N. Sofos, Colorado State University, Fort Collins, CO, USA
- P027 Acid Tolerance of *Escherichia coli* O157:H7 during Aerobic Storage at 4°C, 10°C and 25°C of Beef Treated with Hot Water and Lactic Acid – LAURA V. ASHTON, Konstantinos P. Koutsoumanis, Ifigenia Geornaras, Patricia A. Kendall, and John N. Sofos, Colorado State University, Fort Collins, CO, USA
- P028 The Effect of Simulated Spray-chilling on Acid-habituated and Non-acid-habituated *Escherichia coli* O157:H7 Cells Attached to Beef Carcass Tissue – J. D. STOPFORTH, Y. Yoon, K. E. Belk, G. C. Smith, and J. N. Sofos, Colorado State University, Fort Collins, CO, USA
- P029 Thermal Inactivation of *Enterobacter sakazakii* in Rehydrated Infant Formula – SHARON G. EDELSON-MAMMEL and Robert L. Buchanan, DHHS-FDA-CFSAN, College Park, MD, USA
- P030 Bioluminescent Monitoring of LEE Gene Expression in Living Cells – HAIFENG WANG, Shuyan Liu, and Mansel W. Griffiths, University of Guelph, Guelph, ON, Canada
- P031 Survivability of Calicivirus in Foods and on Surfaces: Experiments with Feline Calicivirus as a Surrogate for Norwalk Virus – SABAH BIDAWID, Naeem Malik, Kalavathi Balagulam, Syed A. Sattar, and Jeffrey M. Farber, Health Canada, Ottawa, ON, Canada
- P032 Survival and Growth of Acid-adapted *Shigella flexneri* in a Traditional Fermented Ghanaian Weaning Food – GLORIA L. TETTEH, Samuel L. Sefa-Dedeh, R. Dixon Phillips, and Larry R. Beuchat, University of Georgia, Griffin, GA, USA
- P033 Impact of Selected Environmental Stresses on the Resistance of *Listeria monocytogenes* Scott A to Electron Beam Irradiation – CLINT JOHNSON, Aubrey Mendonca, James Dickson, and Alan DiSpirito, Iowa State University, Ames, IA, USA
- P034 Studies on Enterotoxin Producing *Staphylococcus aureus* Isolated from Dairy Products in Jordan – SAEB N. EL-SUKHON and Salam A. Ramini, Jordan University of Science and Technology, Irbid, Irbid, Jordan
- P035 Growth of Heat Treated *Clostridium perfringens* Carrying the Enterotoxin Genes on the Chromosome vs. a Plasmid – S. KNOCHEL, T. B. Hansen, and Karin Andersen, Royal Veterinary and Agricultural University, Frederiksberg, Denmark
- P036 Expression of Cold Shock Proteins by *Yersinia enterocolitica* in Synthetic Medium and Foods – THIRUNAVUKKARASU ANNAMALAI and Kumar Venkitanarayanan, University of Connecticut, Storrs, CT, USA
- P037 Effects of Hot Water and Lactic Acid Applied Singly and in Combination on Survival and Growth of *Salmonella* on Fresh Beef Stored at 4, 10 or 25°C – Ifigenia Geornaras, Konstantinos P. Koutsoumanis, LAURA V. ASHTON, Patricia A. Kendall and John N. Sofos, Colorado State University, Fort Collins, CO, USA

- P038 Molecular Surveillance of Shiga Toxigenic *Escherichia coli* O157:H7 by PulseNet USA in 2002 – JENNIFER KINCAID, Susan Hunter, Kristy Kubota, Kelley Hise, Mary Ann Lambert-Fair, Michelle Huddle, James Jones, and Peter Gerner-Smidt, CDC, Atlanta, GA, USA
- P039 Laboratory Investigation of a Multistate Outbreak of Listeriosis in the Northeastern United States, 2002 – L. M. GRAVES, S. B. Hunter, K. Hise, L. Kornstein, Dianna Schoonmaker-Bopp, M. A. Head, J. C. Jones, K. Pupedis, E. Ahanotu, S. Gottlieb, and B. Swaminathan, CDC, Atlanta, GA, USA
- P040 School-related Foodborne Disease Outbreaks in the United States – NICOLE A. TUCKER, Alana C. Sulka, John Painter, Alicia M. Fry, and Paul S. Mead, CDC, Atlanta, GA, USA
- P041 Contributing Factors to Foodborne Disease Outbreaks: Lessons Learned from the Foodborne Outbreak Reporting System, 1998-2000 – ALANA C. SULKA, Nicole A. Tucker, Alicia M. Fry, and Paul S. Mead, CDC, Atlanta, GA, USA
- P042 Foodborne Disease Outbreaks of Undetermined Etiology, 1998-2000 – MICHELLE E. HUDDLE, Alicia M. Fry, Alana C. Sulka, and Paul S. Mead, CDC, Atlanta, GA, USA
- P043 DSC Tracking Canadian Foodborne Outbreaks: A New Tool for Canadian Researchers – KRISTEN BROWN and Judy Greig, University of Guelph, Guelph, ON, Canada
- P044 DSC Quantification of Biofilm Formation by Cold injured and Cold-starved *Listeria monocytogenes* – LINDSEY A. KESKINEN, Ewen C. D. Todd, and Elliot T. Ryser, Michigan State University, East Lansing, MI, USA
- P045 Comparative Characterization of Two *Listeria monocytogenes* Isolates That May Have Originated from the Same Strain Persisting in the Same Food Processing Establishment for Over a Decade – FONE MAO WU, Lewis M. Graves, Catalina Horescu, Michael P. Doyle, and Bala Swaminathan, CDC, Atlanta, GA, USA
- P046 Human Infections in Canada Caused by *Listeria monocytogenes* – FRANCO PAGOTTO, Clifford Clark, Jeffrey Farber, Nathalie Corneau, Johanne Ismail, Manon Lorange, David Woodward, and the Canadian Public Health Laboratory Forum, Health Canada, Food Directorate, Ottawa, ON, Canada
- P047 DSC Investigation of the Role of Quorum-sensing Mechanisms on Virulence Factor Expression in *Listeria monocytogenes* – STACY FAVRIN and Mansel Griffiths, University of Guelph, Guelph, ON, Canada
- P048 Modeling Liquid and Surface Growth Limits of *Listeria monocytogenes* as a Function of pH, a_w and Temperature – KONSTANTINO P. KOUTSOUMANIS, Patricia A. Kendall, and John N. Sofos, Colorado State University, Fort Collins, CO, USA
- P049 DSC Unusual Genetic Features of the *Listeria monocytogenes* Strains Implicated in a Recent Mexican-style Soft Cheese Outbreak – MATTHEW R. EVANS, Charles R. Woods, and S. Kathariou, North Carolina State University, Raleigh, NC, USA
- P050 Thermal Resistance of *Listeria monocytogenes* Scott A during Starvation in Phosphate Buffer, 0.85% Sodium Chloride, or Phosphate Buffered Saline – MAKUBA LIHONO, Aubrey Mendonca, Clint Johnson, and Ainura Orozalieva, University of Arkansas-Pine Bluff, Pine Bluff, AR, USA
- P051 Survival and Recovery of Viable but Non-culturable (VBNC) *Listeria monocytogenes* Cells Starved in a Nutritionally Depleted Medium – SALLY C. C. FOONG and James S. Dickson, Iowa State University, Ames, IA, USA
- P052 Evaluation of Nisin-coated Cellulose Casings for Control of *Listeria monocytogenes* on the Surface of Frankfurters Formulated with Lactates and Stored At 4°C – JEFFREY E. CALL, Myron D. Nicholson, and John B. Luchansky, USDA-ARS-ERRC, Wyndmoor, PA, USA
- P053 Effects of Irradiation on Survival and Growth of *Listeria monocytogenes* and Natural Microflora in Vacuum-packaged Turkey Ham – MEIJUN ZHU, Aubrey Mendonca, Hesham Ismail, and Dong Ahn, Iowa State University, Ames, IA, USA
- P054 DSC Persistence of *Escherichia coli* O157:H7, *Salmonella* Newport, and *Salmonella* Poona in the Gut of a Free-living Nematode, *Caenorhabditis elegans* – STEPHEN J. KENNEY, Gary L. Anderson, Phillip L. Williams, and Larry R. Beuchat, University of Georgia, Griffin, GA, USA
- P055 Incorporation of Sodium Lactate and/or Sodium Diacetate Enhances Thermal Destruction of *Escherichia coli* O157:H7, *Salmonella* Typhimurium, or *Listeria monocytogenes* in Meat and Poultry Products – CATHERINE N. CUTTER and Niraja Ramesh, Pennsylvania State University, University Park, PA, USA
- P056 Control of *Campylobacter jejuni* on the Surface of Raw Chicken Coated with Edible Zein Films Containing Ethylenediaminetetraacetate and/or Nisin – MARLENE E. JONES and Michael G. Johnson, Louisiana State University Agricultural Center, Baton Rouge, LA, USA

- P057 Comparison of Attachment and Penetration Abilities of *Campylobacter jejuni* Isolated from Humans and from Chicken Carcasses Acquired at Processing and Retail – C. D. GILBERT and M. F. Slavik, University of Arkansas, Fayetteville, AR, USA

MONDAY AFTERNOON – AUGUST 11, 2003
1:30 p.m. – 5:00 p.m.

S05 Effective Food Worker Hygiene Interventions: A Risk Assessment Approach

Sponsored by the IAFP Foundation Fund

Organizer: Ewen Todd

Convenors: Judy D. Greig and Ewen Todd

- 1:30 Role of Infected Foodworker in Foodborne Illness Outbreaks and Intervention Strategies – BARRY MICHAELS, Georgia-Pacific Corporation, Palatka, FL, USA
- 1:40 Qualitative Data on Restaurant Workers and Managers Concerning Facilitators and Barriers to Handling Food Safely – CAROL A. SELMAN, CDC, EHS-Net, Atlanta, GA, USA
- 2:10 Application of QMRA to Study Mitigation Strategy Effectiveness at Reducing Pathogen Transmission – BARRY MICHAELS, Georgia-Pacific Corporation, Palatka, FL, USA
- 2:50 Break
- 3:30 The Effective Training of Food Workers to Improve Overall Sanitary Hygiene and Food Safety – CHRIS GRIFFITH, University of Wales Institute, Cardiff, Wales, UK
- 4:00 Strategies for Food Worker Hygiene in Developing Countries – ALEX VON HOLY, University of the Witwatersrand, Johannesburg, South Africa and EWEN TODD, Michigan State University, East Lansing, MI, USA
- 4:30 Benefit Cost Analysis of Personal Hygiene Activities in Reducing Pathogen Transmission in the Healthcare and the Food Industry – BARBARA SOULE, Association for Professionals in Infection Control and Epidemiology Inc., Washington, D.C., USA
- S06 Investigative Molecular Techniques and Their Application to Food Safety**
- Organizer: Manan Sharma**
- Convenors: Michelle Danyluk and Manan Sharma**
- 1:30 The Role of Molecular Techniques in the Identification of Emerging Agents of Foodborne Disease – LEE-ANN JAYKUS, North Carolina State University, Raleigh, NC, USA

- 2:00 Molecular Subtyping to Detect Foodborne Disease Outbreaks: The Past, Present, and Future – MARTIN WIEDMANN, Cornell University, Ithaca, NY, USA
- 2:30 The Use and Impact of Molecular Biology Data on Microbial Risk Assessment – DON SCHAFFNER, Rutgers University, New Brunswick, NJ, USA
- 3:00 Break
- 3:30 The Role of Molecular Techniques in the Food Industry – VICKIE LEWANDOWSKI, Kraft Foods, Glenview, IL, USA
- 4:00 DNA Microarray Technology for Food Safety: Theory and Applications – FRANCO PAGOTTO, Health Canada, Ottawa, ON, Canada
- 4:30 Panel Discussion
- S07 Current Issues in the Microbiological Safety of Dairy Foods – From Farm to Table**
- Sponsored by the IAFP Foundation Fund*
- Organizer: Kathryn Boor, Steven C. Murphy, and Martin Wiedmann**
- Convenors: John Bruhn and Steven Murphy**
- 1:30 Dairy Farm Biosecurity – New York State Cattle Health Assurance Program, a Model for Protecting Dairy Herds and Public Health – KATHLEEN D. KAUFMAN, Cornell University, Ithaca, NY, USA
- 2:00 The Role of Microbiological Criteria and Performance Standards in Ensuring Safe Dairy Foods – A Report from the National Academy of Sciences – KATHRYN J. BOOR, Cornell University, Ithaca, NY, USA
- 2:30 Ensuring Microbiological Safety of Dairy Foods through Processing Management – MARK CARTER, Kraft Foods, Inc., Glenview, IL, USA
- 3:00 Break
- 3:30 Safety Concerns with Aseptic Processing and Packaging of Low Acid Foods – MICHAEL DIGERONIMO, Dover Brook Associates, Chester, NY, USA
- 4:00 Factors Affecting the Microbiological Safety of Raw Milk Cheese – CATHERINE W. DONNELLY, University of Vermont, Burlington, VT, USA
- 4:30 Farm to Table Dairy Food Safety: Challenges and Opportunities in Research and Implementation – MARTIN WIEDMANN, Cornell University, Ithaca, NY, USA

S08 Hot Topics in Seafood Quality and Safety

Sponsored by the IAFP Foundation Fund

Organizers/Convenors: Linda Andrews and Brian Himelbloom

- 1:30 Histamines and Carbon Monoxide-Packaged Tuna – GEORGE FLICK, JR., Virginia Tech, Blacksburg, VA, USA
- 2:00 Scombrototoxin Production and Prevention – DAVID GREEN, North Carolina State University, Morehead City, NC, USA
- 2:30 Risk Assessment of *Vibrio* in Oysters – ANDY DEPAOLA, FDA, Dauphin Island, AL, USA
- 3:00 Break
- 3:30 Heavy Metals in Seafood – RITA SCHOENY, EPA, Washington, D.C., USA
- 4:00 Detection and Quantification of Genetically Modified Foods and Seafood – MIKE RUSSELL, Gene Scan USA, Inc., Belle Chasse, LA, USA
- 4:30 Safety of Ready-to-eat Seafood and Retail Sushi – DOUG MARSHALL, Mississippi State University, Mississippi State, MS, USA

T02 Food Safety Management and Communication

Convenors: Randy W. Worobo and Purnendu C. Vasavada

- 1:30 Prevalence of *Escherichia coli* O157 among
T13 Finishing Beef Cattle Supplemented with Live
DSC Cultures of *Lactobacillus* and *Propionibacterium* – SPRING YOUNG'S-DAHL, Mindy Brashears, Michael Galyean, Guy Loneragan, and Nathan Elam, Texas Tech University, Lubbock, TX, USA
- 1:45 Factors Influencing the Recovery of Micro-organisms from Surfaces Using Sterile Sampling
T14 Sponges –GINNY MOORE and Chris Griffith,
DSC University of Wales Institute-Cardiff, Cardiff, UK
- 2:00 Transfer of *Listeria monocytogenes* during
T15 Commercial Slicing of Delicatessen Products –
DSC K. L. VORST, Ewen C. D. Todd, and Elliot T. Ryser, Michigan State University, East Lansing, MI, USA
- 2:15 Handwashing and Gloving for Food Protection
T16 – Microbial Transfer from Contaminated Hands, Gloves, and Utensils to Food – Elanor J. Fendler, Yusuf Ali, Michael J. Dolan, and JAMES W. ARBOGAST, GOJO Industries, Inc., Akron, OH, USA

- 2:30 Air Quality Issues Associated with Hand Drying
T17 Devices in Food Processing, Food Service and Public Facility Handwash Stations – Roger Bailey, Liz Redmond, Barry Michaels, Christopher Griffith, Vidhya Gangar, Armando D'Onorio, and LOUISE FIELDING, University of Wales Institute-Cardiff, Cardiff, Wales, UK
- 2:45 Break
- 3:15 An Examination of Food Safety Risk Management Behavioral Trends of Ontario Greenhouse
T18 Vegetable Growers – BENJAMIN CHAPMAN,
DSC Amber Luedtke, and Douglas Powell, University of Guelph, Guelph, ON, Canada
- 3:30 Assessing the Cost of Microbiological Failures
T19 to Food Manufacturers and the Primary Reasons for Product Contamination – DAVID LLOYD, University of Wales Institute-Cardiff, Cardiff, South Glamorgan, Wales, UK
- 3:45 Development of Information Resources to
T20 Assist Small Businesses in Hazard Identification – Louise Fielding, LEANNE ELLIS, Cliff Beveridge, and Adrian Peters, University of Wales Institute-Cardiff, Cardiff, UK
- 4:00 Review of the Use of Scientific Criteria and
T21 Performance Standards for Safe Food – RICARDO MOLINS, Maria Oria, and Tazima Davis, Institute of Medicine of the National Academies, Washington, D.C., USA

- 4:15 Improving Urgent Public Health Information
T22 Dissemination in California: The Food Safety Notification System – JENNIFER THOMAS and Jeff Farrar, California Dept. of Health Services, Sacramento, CA, USA
- 4:30 Development and Evaluation of an Educational
T23 Resource to Engage Senior High School
DSC Students in Dialogue Regarding Genetically Engineered Food – LIZ V. GOMES and Doug Powell, University of Guelph, Guelph, ON, Canada
- 4:45 Spot the Mistake: What Television Cooking
T24 Shows Teach Viewers – LISA MATHIASSEN, Ben
DSC Chapman, Bonnie Lacroix, and Douglas Powell, University of Guelph, Guelph, ON, Canada

P02 Microbiological Methods

3:00 p.m. – 6:00 p.m.
(Authors present 3:30 p.m. – 5:30 p.m.)

Convenors: Megan Hereford and Manan Sharma

- P058 Evaluation of Coliform and *Escherichia coli* Methods for Testing Raw Materials and Finished Products of Nutritional Foods and Supplements – Y. JENNIFER LEE and Nathan A. Lewis, Access Business Group, Ada, MI, USA

- P059 Study on Presumptive Test Methods for the Detection of *Escherichia coli* in High-salted Seasoning – DONG-KYU KIM, Hye-Won Shin, Kyung-Hee You, Dae-Woo Park, and Hee-Kyung Park, CJ Corporation, SEOUL, Korea
- P060 Validation of a New ELISA-based Method for the Detection of VTEC in Food – Véronique Buecher, Marie-Laure Sorin, Bruno Cristau, and PATRICE ARBAULT, Diffchamb SA, Lyon, France
- P061 Evaluation and Development of Methods for Recovery of *Escherichia coli* O157:H7 from Artificially Contaminated Chicken Litter – P. PANGLOLI, C. A. Doane, O. Ahmed, D. A. Golden, and F. A. Draughon, University of Tennessee, Knoxville, TN, USA
- P062 Combination of Immunomagnetic Separation and Liposome Immunoassay for the Detection of *Escherichia coli* Serotype O157 – MYUNGHEE KIM, Richard A. Montagna, and Richard A. Durst, Korea Food Research Institute, Sungnam, Kyounggi, Republic of Korea
- P063 Potential for Underestimation of *Escherichia coli* O157:H7 Prevalence in Beef Feedlot Cattle – G. H. LONERAGAN, M. M. Brashears, and G. Dewell, West Texas A & M University, Canyon, TX, USA
- P064 *Escherichia coli* O157 LPS Contamination in Reusable Sampling Vessels as a Source of False Positive Immunoassay Test Results – T. Lawruk, O. CLOAK, G. Teaney, K. Westmoreland, A. Miele, C. Tidrick, and Y. Rosa, Strategic Diagnostics Inc., Newark, DE, USA
- P065 Comparison of Methods for Detection and Isolation of Cold-stressed *Escherichia coli* O157:H7 in Raw Ground Beef – PINA M. FRATAMICO and Lori K. Bagi, USDA-ARS-ERRC, Wyndmoor, PA, USA
- P066 DSC Characterization and Antibacterial Susceptibility of *Staphylococcus aureus* Strains Isolated from Mastitic Milk by 3M Staph Express Count System – ALISON WIECKOWICZ, Michelle Frederick, and Purnendu C. Vasavada, University of Wisconsin-River Falls, River Falls, WI, USA
- P067 Immunoaffinity Columns as a Clean-up Tool for Improving the Detection of Staphylococcal Enterotoxins in Foods – Laure Buscarlet, Guillaume Boigey, Bruno Cristau, and PATRICE ARBAULT, Diffchamb SA, Lyon, France
- P068 Application of Extended Single-reaction Multiplex PCR for Toxin Typing of *Staphylococcus aureus* isolates in Korea – N. H. KWON, S. H. Kim, K. T. Park, W. K. Bae, J. Y. Kim, J. Y. Lim, J. S. Ahn, K. S. Lyoo, J. M. Kim, W. K. Jung, K. M. Noh, G. A. Bohach, and Y. H. Park, Seoul National University, Seoul, Korea
- P069 Validation of the USDA-ARS Package Rinse Method for Recovery of *Listeria monocytogenes* from Naturally Contaminated, Commercially-prepared Frankfurters – F. MORGAN WALLACE, Jeffrey E. Call, and John B. Luchansky, USDA-ARS, Wyndmoor, PA, USA
- P070 Detection of *Listeria* sp. in Meat and Meat Products Using Tecra® *Listeria* VIA™ and Biocontrol VIP® for *Listeria* Immunoassays and a Cultural Procedure – L. C. Aragon, M. Landgraf, B. D. G. M. Franco, and M. T. DESTRO, Universidade de São Paulo, São Paulo, Brazil
- P071 Multi-laboratory Comparative Study of a PCR-based System and the Standard Cultural Methods for the Detection of *Listeria monocytogenes* in Foods – KAREN SILBERNAGEL and Mark Barbour, rtech laboratories, St. Paul, MN, USA
- P072 Evaluation of a Harmonized Enrichment Method for the Detection of *Listeria monocytogenes* by Two Individual Assays – CHARLES CARVER, Karen Silbernagel, and Ron Johnson, rtech laboratories, St. Paul, MN, USA
- P073 Comparison of a Chromogenic Agar to Conventional Agar Media for the Detection of *Listeria monocytogenes* – ROBERT P. JECHOREK, Michele Lattrez, and Wendy Lauer, rtech laboratories, St. Paul, MN, USA
- P074 A Method for Evaluating Changes to UVM Media for Improving the Growth of *Listeria monocytogenes* – DARRELL O. BAYLES, USDA-ARS, Wyndmoor, PA, USA
- P075 Evaluation of the MicroFoss System for the Detection of *Listeria* Species in Environmental Samples – JOSEPH A. ODUMERU and Jennifer Belvedere, University of Guelph, Guelph, ON, Canada
- P076 Development and Optimization of a Real-time PCR Assay for the Detection of *Listeria monocytogenes* Using the LightCycler® System – KAREN SUSAN DUFFY, Maura Glennon, Louise O'Connor, and Majella Maher, National Diagnostics Centre, Galway, Ireland
- P077 Multiplex PCR for Serotype Identification of *Listeria monocytogenes* – FONE MAO WU, M. O. Rivera, L. Graves, P. Fields, S. Kathariou, and B. Swaminathan, CDC, Atlanta, Georgia, USA

- P078 DSC Comparison of MPN Procedures Designed for Recovery of Low-level Healthy and Injured *Listeria monocytogenes* in Ready-to-Eat Foods - E. GROVES, T. M. Silk and C. W. Donnelly, University of Vermont, Burlington, VT, USA
- P079 Use of Sequence Typing for Characterization of Virulence Factors and for the Development of a Novel Molecular Typing Scheme for *Listeria monocytogenes* - FRANCO PAGOTTO, Nathalie Corneau, Sandy Smole, and Jeffrey M. Farber, Health Canada, Ottawa, ON, Canada
- P080 Twenty-four Hour Enrichment and Detection of Stressed *Listeria monocytogenes* on Stainless Steel Surfaces Using PATHIGEN® *Listeria* Broth and the PATHIGEN *Listeria* Test - Zainab Abbas, CHARLES YOUNG, and Jill White, IGEN International, Inc., Gaithersburg, MD, USA
- P081 Comparative Analysis of a Rapid Immunoassay to the Standard Cultural Methods for the Detection of *Listeria monocytogenes* in Ready-to-Eat Foods and Dairy Products - KAREN SILBERNAGEL, Charles Carver, and Ron Johnson, rtech laboratories, St. Paul, MN, USA
- P082 Evaluation of a Lateral Flow Immunoassay for the Detection of *Salmonella* in Raw Beef - J. Li, O. Cloak, T. Joaquim, A. McCardell, and G. TEANEY, Strategic Diagnostics Inc., Newark, DE, USA
- P083 Use of Automated Immunomagnetic Separation for Detection of *Salmonella* in Cattle Feces - Narelle Fegan and PATRICIA DESMARCHELIER, Food Science Australia, Tigalpa DC, Qld, Australia
- P084 Comparison of Electrochemical, Impedance and Optical Sensors for Rapid Detection of Live *Salmonella* Typhimurium in Food Products - YANBIN LI, Xiao-Li Su, Byungchul Kim, and Liju Yang, University of Arkansas, Fayetteville, AR, USA
- P085 A Rapid 24-hour Enrichment Protocol for *Salmonella* in Foods - J. LI, G. Teaney, O. Cloak, and J. Stave, Strategic Diagnostics Inc., Newark, DE, USA
- P086 Evaluation of Methods for Recovery of *Salmonella* from Poultry and Swine Feed - F. R. JACKSON, P. Pangloli, Y. Dje, S. P. Oliver, A. Mathew, D. A. Golden, W. J. Taylor, and F. A. Draughon, University of Tennessee-Knoxville, Knoxville, TN, USA
- P087 A Rapid Test Method for the Detection of *Salmonella* in Dairy Factory Environmental Samples - JILL GEBLER and Scott McAlpine, Murray Goulburn Co-op Co. Ltd., Yarram, Victoria, Australia
- P088 Real Time PCR Analysis of Primary *Salmonella* Enrichments from Broiler Carcasses Using the R.A.P.I.D. IT - *Salmonella* Assay - G. R. SIRAGUSA, W. C. Cray, D. O. Abbott, J. C. Jones, and I. Son, USDA-ARS, Athens, GA, USA
- P089 Detection of *Salmonella* from Chicken Rinse and Chicken Franks with Electrochemiluminescence and Automated PCR Assays - J. S. BAILEY and D. E. Cosby, USDA-ARS-RRC, Athens, GA, USA
- P090 Evaluation of a Classic PCR Method and an Electrochemical ELISA Method Coupled with an FIA System for the Detection of *Salmonella* in Meat - L. CROCI, G. Palleschi, G. Volpe, E. Delibato, D. De Medici, and L. Toti, Italian National Institute of Health, Rome, Italy
- P091 Duplex SYBR-Green Real Time PCR for Detection of *Salmonella* spp. and *S. Enteritidis* in Poultry - D. DE MEDICI, L. Croci, E. Delibato, S. Di Pasquale, E. Filetici, and L. Toti, Italian National Institute of Health, Rome, Italy
- P092 Evaluation of Methods for Recovery of *Salmonella* spp. from Dairy Environmental Samples - P. PANGLOLI, Yobouet Dje, W. J. Taylor, D. A. Golden, S. P. Oliver, and F. A. Draughon, University of Tennessee, Knoxville, TN, USA
- P093 DSC Validation Assay of Two Immuno-diagnostic Methods (VIDAS SLM and VIDAS ICS) and Two Classical Methods (SP-VG-M002 and NMKL 71) for *Salmonella* Detection in Fecal Samples from Porcine Origin - N. KORSACK, J. -N. Degeye, G. Etienne, E. Samuëls, P. Van Nieulande, and G. Daube, Liege University, Liege, Belgium
- P094 DSC Fluorescent In Situ Hybridization for the Culture-independent Detection of *Campylobacter jejuni* - LISA M. WADDINGTON and Heidi Schraft, Lakehead University, Thunder Bay, ON, Canada
- P095 In Vitro Invasive Assay for *Campylobacter jejuni* from Raw Broiler Carcass Rinses - R. Nannapaneni, R. Story, K. Wiggins, and M. G. JOHNSON, University of Arkansas, Fayetteville, AR, USA
- P096 Comparison of Total Cost, Method Efficiency, and Laboratory Productivity of Selected Microbiological Test Kits - DEBORAH McINTYRE, rtech laboratories, St. Paul, MN, USA
- P097 Methods for the Recovery and Detection of Human Enteric Viruses from Complex Food Matrices - MICHAEL J. CASTEEL, David C. Love, and Mark D. Sobsey, University of North Carolina-Chapel Hill, Chapel Hill, NC, USA

- P098 Evaluation of Methods for Declumping of *Mycobacterium avium* ssp. *paratuberculosis* – NIMITA H. FIFADARA and Jeffrey L. Kornacki, University of Georgia, Griffin, GA, USA
- P099 DSC Effect of Enumeration Media on the Recovery of High-pressure Processed *Bacillus subtilis* Spores – V. RASANAYAGAM, E. Patazca, J. Dunn, and V. M. Balasubramaniam, NCFST, Illinois Institute of Technology, Summit Argo, IL, USA
- P100 The Use of Immuno- and Cytotoxicity Assays in the Detection of Enterotoxins in Filtrates from Strains of *Bacillus* spp. – ALEX Y. TEO and Hai-Meng Tan, Kemin Industries (Asia) Pte. Ltd., Singapore, Republic of Singapore
- P101 Efficacy of Clostridial Plate Counts as a Substitute for Botulinum Toxin Detection during Botulinal Challenge Studies of Foods – ANN E. LARSON and Eric A. Johnson, University of Wisconsin-Madison, Madison, WI, USA
- P102 3M™ Petrifilm™ Staph Express Count Plate for the Rapid Enumeration of *Staphylococcus aureus* in Foods – Collaborative Study – BARBARA HORTER and Kathryn Lindberg, 3M Microbiology, St. Paul, MN, USA
- P103 Enumerating 3M™ Petrifilm™ Aerobic Count Plates Using The PetriScan™ Automated Colony Counter – EILEEN GARRY, Meredith Pesta, and Patrick Williams, Advanced Instruments, Inc., Norwood, MA, USA
- P104 Fourier Transform Infrared Spectroscopy for Rapid Detection, Identification, and Enumeration of Bacteria in Foods – H. Yang, S. A. IBRAHIM, and C. W. Seo, North Carolina A&T State University, Greensboro, NC, USA
- P105 Menadione-catalyzed Luminol Chemiluminescent Assay for the Rapid Detection and Estimation of Viable Bacteria – S. KAWASAKI, S. Yamashoji, A. Asakawa, and K. Isshiki, National Food Research Institute, Tsukuba-shi, Ibaraki, Japan
- P106 A Rapid Protocol for the Isolation and Identification of Pathogens from a Lateral Flow Device – J. LI, G. Teaney, O. Cloak, and J. Stave, Strategic Diagnostics Inc., Newark, DE, USA
- P107 DSC Direct Detection of Bacterial Pathogens in Representative Dairy Products Using a Combined Bacterial Concentration – PCR Approach – KELLY A. STEVENS, Mark Cullison, and Lee-Ann Jaykus, North Carolina State University, Raleigh, NC, USA
- P108 Rapid and Simultaneous Detection of Nine Foodborne Pathogenic Bacteria Using Multiplex PCR Method – Soon Yong Choi, Kwang Won Hong, Gang Gwon Lee, Jung Soon Kim, Kap Soo Kim, Sun Mi Choi, Soo Bok Kim, and YONG SUK NAM, R&D Center, KoGene BioTech., Inc, Seoul, Korea
- P109 PCR-based Fluorescent Assay for Rapid Detection of *Escherichia coli* O157:H7 and *Listeria monocytogenes* – H. WANG, Y. Li, and M. Slavik, University of Arkansas, Fayetteville, AR, USA
- P110 Detection of Biowarfare Agents in Food by Use of Fluorescent PCR – John W. Czajka, Tracey Biggs, Leslie Williams, Diane L. Dutt, and JAMES E. ROGERS, Soldier's Biological and Chemical Command, Aberdeen Proving Ground, MD, USA
- P111 A Comparative Study of Two Immunoassays for the Detection of Chloramphenicol in Milk and Shrimps – Cors Arts, Piet van Wichen, Anders Hestner, and PATRICE ARBAULT, Diffchamb SA, Lyon, France
- P112 Rapid Determination of Histamine in Food Using a Colorimetric Enzyme Assay – TSUNEO SATO and Ikuko Nishimura, Kikkoman Corporation, Noda City, Chiba Pref., Japan
- P113 DSC Screening for Potential Aflatoxin-producing Molds in Korean Fermented Foods and Grains by Multiplex PCR and Enzyme Immunoassay – WON-BO SHIM, Zheng-You Yang, Seon-Ja Park, and Duck-Hwa Chung, Graduate School of Gyeongsang National University, Chinju, Gyeongnam, Korea
- P114 In Vitro Study of Ochratoxin A Production by *Aspergillus carbonarius* and *A. niger* Isolates and Detection by HPLC and Enzyme Immunoassay – Maria Lúcia Martins, H. Marina Martins, and FERNANDO BERNARDO, CIISA-Faculdade Medicina Veterinária, Lisbon, Portugal, Portugal
- P115 DSC Efficacy of Capric/Caprylic Acid, Lactic Acid, Glycerol Monolaurate and Peroxyacid Alone or in Combination for Inactivating *Escherichia coli* O157:H7 on Artificially Contaminated Alfalfa Seeds – PASCALE M. PIERRE, Jerry N. Cash, and Elliot T. Ryser, Michigan State University, East Lansing, MI, USA
- P116 Applicability of Image Analysis in Modeling of Bacterial Growth – E. Varzakis, P. N. SKANDAMIS, and G. J. E. Nychas, Agricultural University of Athens, Athens, Votanikos, Greece

TUESDAY, AUGUST 12, 2003

8:30 a.m. – 12:00 p.m.

S09 New Horizons in Diagnostic Food Microbiology

Sponsored by ILSI N.A.

Organizer: Catherine Nnoka

Convenors: J. Stan Bailey, Les Smoot, and Bala Swaminathan

8:30 Overview – PETER FENG, FDA-CFSAN, College Park, MD, USA

9:00 Real-time PCR – PINA FRATIMICO, USDA-ARS-ERRC, Wyndmoor, PA, USA

9:30 Biosensors – MARIANNE F. KRAMER, University of South Florida, Tampa, FL, USA

10:00 Break

10:30 Molecular Identification of *Salmonella* Serotypes – PATRICIA FIELDS, CDC, Atlanta, GA, USA

11:00 Biochip/Microarray – CLAUDE MABILAT, bioMérieux, Venissieux, France

11:30 International Standardization and Harmonization of Detection Methods – MICHAEL H. BRODSKY, Brodsky Consultants, Thornhill, ON, Canada

S10 Food Allergens: Past, Present, and Future

Organizer: Veny Gapud

Convenors: Tong-Jen Fu and Veny Gapud

8:30 Food Allergens: What are the Issues? – SUSAN L. HEFLE, University of Nebraska, Lincoln, NE, USA

9:00 Regulatory Perspective: Current Practice and Future Directions – KENNETH J. FALCI, FDA-CFSAN, College Park, MD, USA

9:30 Updates on Food Allergen Detection – JUPITER YEUNG, NFPA, Washington, D.C., USA

10:00 Break

10:30 Food Allergens and Sanitary Design – BOB RICHARDSON, General Mills, Inc., Minneapolis, MN, USA

11:00 How Clean is Allergen Clean and How Do You Know? – MARK MOORMAN, W. K. Kellogg, Battle Creek, MI, USA

11:30 Food Allergens and the Food Service Industry – SHEILA COHN, National Restaurant Association, Washington, D.C., USA

S11 Costs of Industry and Government Food Safety Actions: What is at Stake?

Organizer: Stan Bailey

Convenors: Stan Bailey and Jenny Scott

8:30 The Human Cost of Foodborne Bacterial Diseases – AMBER JESSUP, FDA-CFSAN, College Park, MD, USA

9:00 The Costs of On-Farm Interventions to Reduce Pathogen Contamination – STAN BAILEY, USDA-ARS, Athens, GA, USA

9:30 The Costs of In-Plant Interventions to Reduce Pathogen Contamination – LARRY COHEN, Kraft Foods, Glenview, IL, USA

10:00 Break

10:30 The Costs of Microbiological Testing – In-House vs. Contract Laboratories – LORI LEDENBACH, Kraft Foods, Glenview, IL, USA

11:00 Federal Mandate to Show Costs of New Food Regulations, A Case Study Dealing with *Listeria* Control in RTE Meat and Poultry Products – PHIL SPINELLI, USDA-FSIS-RDDS, Washington, D.C., USA

11:30 Food Industry Perspective on Costs of Intervention vs. Recalls – JENNY SCOTT, NFPA, Washington, D.C., USA

S12 Spoilage and Pathogenic Fungi and Yeasts

Organizers/Convenors: Ailsa D. Hocking and Eric A. Johnson

8:30 A Loaf of Bread, a Jug of Wine, and Ochratoxin A – AILSA D. HOCKING, CSIRO – Food Science Australia, North Ryde, NSW, Australia

9:00 Detection of Fungi – MARIBETH A. COUSIN, Purdue University, West Lafayette, IN, USA

9:30 Metabiotic Associations of Fungi and Foodborne Pathogens – LARRY R. BEUCHAT, University of Georgia, Griffin, GA, USA

10:00 Break

10:30 Economic Impact and Control of Fungi and Mycotoxins in Foods – LLOYD L. BULLERMAN, University of Nebraska-Lincoln, Lincoln, NE, USA

11:00 Strategies for Control of Aflatoxin Contamination in Food and Feeds – DEEPAK BHATNAGAR, USDA-SRRC, New Orleans, LA, USA

- 11:30 Use of Genomics to Develop Novel Antifungals for Food Use – STANLEY BRUL, University of Amsterdam/Unilever Research, Amsterdam, The Netherlands
- T03 Produce Microbiology**
Convenors: Alejandro Castillo and Linda J. Harris
- 8:30 The Bactericidal Use of Ozone in the Treatment of Fresh Strawberries – ROGER A. BAILEY, Chris Griffith, Tim Jackson, and Louise Fielding, University of Wales Insitute-Cardiff, Cardiff, South Glamorgan, Wales, UK
- 8:45 Comparison of Inoculation Methods to Determine the Efficacy of Chlorine Dioxide Gas and Chlorinated Water Treatments to Reduce *Escherichia coli* O157:H7 on Strawberries – Y. HAN, R. H. Linton, and P. E. Nelson, Purdue University, W. Lafayette, IN, USA
- 9:00 Elimination of Molds on Dried Fruits and Nuts by Electron Beam Irradiation – Erhan Ic, Joe Maxim, and SURESH D. PILLAI, Texas A&M University, College Station, TX, USA
- 9:15 UV Disinfection of Juices: Challenges of Microbiological Validation of Flow-through Reactors –TATIANA KOUTCHAM and Brian Parisi, NCFST-IIT, Summit-Argo, IL, USA
- 9:30 Infiltration and Survival of *Escherichia coli* ATCC 25922 on Apples under Orchard Conditions – BASSAM A. ANNOUS, Angela Burke, and Mosbah K. Kushad, USDA-ARS-ERRC, Wyndmoor, PA, USA
- 9:45 Break
- 10:15 Antilisterial Activity in Cut Iceberg Lettuce Extracts – PASCAL DELAQUIS, Aimin Wen, and Peter Toivonen, Agriculture and Agri-Food Canada, Summerland, BC, Canada
- 10:30 Organically Grown Lettuce: Hygienic Quality and Risk of Transfer of Pathogenic Bacteria – GRO S. JOHANNESSEN, Randi Berland, Liv Solemdal, Anne Margrete Urdahl, and Liv Marit Rørvik, National Veterinary Institute, Oslo, Norway
- 10:45 A Survey to Determine Field and Packing House Hygiene Practices in New York – ROBERT B. GRAVANI and Elizabeth A. Bihn, Cornell University, Ithaca, NY, USA
- 11:00 A Field Study of the Microbiological Quality of Fresh Produce – LYNETTE KLEMAN, Lee-Ann Jaykus, Deborah Moll, Christine Moe, Cecilia Martinez, and Juan Anciso, North Carolina State University, Raleigh, NC, USA
- 11:15 Preliminary Evaluation of *Citrobacter* spp. as a Surrogate for *Salmonella* in Controlled Release Field Studies – TREVOR V. SUSLOW, Marcella Zuniga, and Bradley Butterfield, University of California-Davis, CA, USA
- 11:30 Pre-symptomatic Infection of Asparagus by *Pectobacterium carotovora* subsp. *carotovora* Increases Wound Co-colonization by *Escherichia coli* O157:H7 and *Salmonella* Serotypes – Lorena Fernandez, Marcella Zuniga, Alex Baker, and TREVOR V. SUSLOW, University of California-Davis, CA, USA
- 11:45 The Use of Gradient Plates to Study the Combined Effect of Temperature, pH and NaCl Concentration on the Growth of *Monascus ruber* van Tieghem, an Ascomycetes Fungus Isolated from Green Table Olives – E. Z. Panagou, P. N. Scandamis and G. -J. E. NYCHAS, Agricultural University of Athens, Athens, Votanikos, Greece
- P03 Foods of Animal Origin**
 10:00 a.m. – 1:00 p.m.
 (Authors present 10:30 a.m. – 12:30 p.m.)
Convenors: Yash Perdue and Suwang Trivedi
- P117 Effect of Liquid Alum on Naturally Occurring *Salmonella* and *Campylobacter* in Poultry Broiler Production Facilities – KEN A. ARMSTRONG, Felix R. Jackson, Robert T. Burns, Forbes R. Walker, and F. Ann Draughon, University of Tennessee-Knoxville, Knoxville, TN, USA
- P118 Genotypic Characterization by Pulsed-Field Gel Electrophoresis and Antibiotic Resistance of *Campylobacter* Strains Isolated from Poultry Litter – J. E. STRATTON, R. W. Hutkins, and M. M. Brashears, University of Nebraska, Lincoln, NE, USA
- P119 Mycoflora and Occurrence of Aflatoxin and Fumonisin in Poultry Feeds – RAIZA CASANOVA, Leonardo Altuve, and Amaury Martínez, Instituto de Ciencia y Tecnología de Alimentos, Universidad Central de Venezuela, Caracas, DC, Venezuela
- P120 Prevalence of *Campylobacter* in Chicken from Pluck Shops in Trinidad – S. RODRIGO, Z. Asgaralli, W. H. Swanson, and A. A. Adesiyun, University of the West Indies, Mt. Hope, Republic of Trinidad and Tobago
- P121 *Campylobacter* and *Salmonella* in Raw Chicken: Updated Baseline Figures for 2002 – RICHARD MELDRUM and Ceri Edwards, Public Health Laboratory Service, Wales, Penarth, UK
- P122 Effect of Gut Content Contamination on Broiler Carcass *Campylobacter* Counts – MARK BERRANG, Doug Smith, W. Robert Windham, and Peggy Feldner, USDA-ARS, Athens, GA, USA

- P123 Characterization of Aerobically Growing *Campylobacter jejuni* IC 21 Isolated from Chicken Carcasses – YOUNG DUCK LEE, Jung Soon Jang, Ji Hyun Jang, Mi Kyoung Jung, Hak Gil Chang, and Jong-Hyun Park, Kyungwon University, Seongnam, Kyonggi, Republic of Korea
- P124 Influence of Dietary Vitamin E on Behavior of *Listeria monocytogenes* and Color Stability in Ground Turkey Meat Following Electron Beam Irradiation – MARIA ROMERO, Aubrey Mendonca, and Dong Ahn, Iowa State University, Ames, IA, USA
- P125 A Longitudinal Analysis of *Campylobacter* Colonization in Sibling Turkey Flocks with Marked Differences in Colonization by *Campylobacter* – KATIE SMITH, Nancy Reimers, John Barnes, Bong Choon Lee, Robin Siletzky, and Sophia Kathariou, North Carolina State University, Raleigh, NC, USA
- P126 The Potential for Retail Poultry Packs to be a Source of *Campylobacter* or *Salmonella* Infection – ROSEMARY WHYTE, TeckLok Wong, Angela Hough, and J. Andrew Hudson, Institute of Environmental Science and Research, Christchurch, New Zealand
- P127 Strain Persistence and Fluctuation of *Campylobacter coli* Colonizing Turkeys Over Successive Production Cycles – BONG-CHOON LEE, Nancy Reimers, John Barnes, Robin Siletzky, and Sophia Kathariou, North Carolina State University, Raleigh, NC, USA
- P128 Effect of Freezing on the Survival of Cold-stressed *Campylobacter jejuni* in Ground Chicken and Chicken Skin – SAUMYA BHADURI, USDA-ARS-ERRC, Wyndmoor, PA, USA
- P129 Incidence of *Bacillus cereus* in Retail Poultry Products – D. P. SMITH, M. E. Berrang, and P. W. Feldner, USDA-ARS, Athens, GA, USA
- P130 Inhibitory Effects of Organic Acid Salts on Growth of *Clostridium perfringens* from Spore Inocula during Chilling of Marinated Ground Turkey Breast – VIJAY K. JUNEJA and H. Thippareddi, USDA-ARS-ERRC, Wyndmoor, PA, USA
- P131 *Aeromonas* spp. Associated with Commercial Poultry Processing – ARTHUR HINTON, JR., J. A. Cason, and Kimberly D. Ingram, USDA-ARRC, Athens, GA, USA
- P132 Identification of Enterobacteriaceae from Washed and Unwashed Commercial Shell Eggs – M. T. MUSGROVE, D. R. Jones, J. K. Northcutt, N. A. Cox, and M. A. Harrison, USDA-ARS Poultry Processing and Meat Quality Research Unit, Athens, GA, USA
- P133 Can *Salmonella* Enteritidis Breach the Vitelline Membrane of Fresh Chicken Eggs? – G. J. FLEISCHMAN, C. L. Napier, and S. A. Palumbo, FDA, Summit-Argo, IL, USA
- P134 Hygiene and Food Safety Controls in On-farm Dairies – GORDON HAYBURN, Chris Griffith, and Adrian Peters, University of Wales Institute-Cardiff, Cardiff, Wales, UK
- P135 Comparative Studies on Milk Discard Period of Two Ceftiofur Products: Accent™ and Naxcel™ – by TTC and Charm II Beta-lactam Receptor Assay – Jin-Hyang Choi, Su-Jung Park, Sang-Hyun Lee, HYE-JIN YANG, Chang-Hoon Han, Hang Lee, and Mun-Han Lee, Seoul National University, Seoul, Kwanak-gu, Republic of Korea
- P136 Inactivation of *Escherichia coli* O157:H7 and *Listeria monocytogenes* in Milk by Caprylic Acid and Monocaprylin – MANOJ KUMAR MOHAN NAIR, Pradeep Vasudevan, and Kumar Venkitanarayanan, University of Connecticut, Storrs, CT, USA
- P137 Listeriosis Outbreak in Québec, Canada, Linked to Heat-treated Cheeses – COLETTE GAULIN, Danielle Ramsay, and Louise Ringuette, Ministry of Health, Province of Québec, Canada
- P138 Survival of *Salmonella* and *Listeria monocytogenes* on Shredded Cheese – PATRICK EIMERMAN, Michelle Hanson, Ann Larson, Lindsey McDonnell, Kathy Glass, and Eric Johnson, University of Wisconsin-Madison, Madison, WI, USA
- P139 Survival of *Listeria monocytogenes* in Vanilla Flavored Soy and Dairy Products Stored at 8°C – SIREESHA TIPPARAJU, Sadhana Ravishankar, and Peter J. Slade, Illinois Institute of Technology, Summit-Argo, IL, USA
- P140 Viability of Bifidobacteria in Yogurt Products – J. P. CARR, M. Worku, G. Shahbazi, C. W. Seo, and S. A. Ibrahim, North Carolina A&T State University, Greensboro, NC, USA
- P141 Geographic Information System and Epidemiological Associations among Foodborne Pathogens at the Farm – KIMBERLY D. LAMAR, Phillipus Pangloli, David Golden, Stephen P. Oliver, and F. Ann Draughon, University of Tennessee-Knoxville, Knoxville, TN, USA
- P142 Shiga Toxin-producing *Escherichia coli* in Beef Heifers Grazing Rangeland Forages – HUSSEIN HUSSEIN, Brandolyn Thran, and Mark Hall, University of Nevada-Reno, Reno, NV, USA

- P143 Supplementing Feedlot Cattle Diets with Whole Cottonseed to Decrease the Prevalence of *Escherichia coli* O157:H7 – SPRING YOUNTS-DAHL, Mindy Brashears, Michael Galyean, and Guy Loneragan, Texas Tech University, Lubbock, TX, USA
- P144 Experimental and Field Evaluation of Excision and Swab-based Sampling Methods for Porcine, Ovine and Bovine Carcasses – M. L. Hutchison, D. Wilson, C. -A. Reid, A. M. Johnston, M. Howell, and John N. BUNCIC, University of Bristol, Langford, Bristol, UK
- P145 Heat Resistance of Inoculated *Salmonella* on Fresh Beef as Affected by Decontamination Treatments, Storage Temperature, and Storage Time – KONSTANTINOS P. KOUTSOUMANIS, Ifigenia Geornaras, Laura V. Ashton, Patricia A. Kendall, and John N. Sofos, Colorado State University, Fort Collins, CO, USA
- P146 Activated Lactoferrin Blocks *Escherichia coli* O157:H7 Interaction with Collagen Matrix and Beef Tissue – K. GUSTILO, C. Martinez, J. Tulpinski, A. Narbad, R. de Waard, F. Buikstra, and A. S. Naidu, N-terminus Research Laboratory, Pomona, CA, USA
- P147 Electrostatic Spray Application of Activated Lactoferrin on Beef – Surface Distribution, Tissue Diffusion and Antimicrobial Activity – J. TULPINSKI, R. Galasso, K. Gustilo, R. Nimmagudda, and A. S. Naidu, N-terminus Research Laboratory, Pomona, CA, USA
- P148 Evaluation of Hot Water Immersion for Reduction of *Escherichia coli* O157:H7 on Beef Shanks – JASON E. MANN and Mindy Brashears, Texas Tech University, Lubbock, TX, USA
- P149 The Sources of *Escherichia coli* Contamination of Ground Beef in a Commercial Beef Processing Plant – Mueen Aslam, Frances Nattress, GORDON GREER, Colin Gill, and Lynn McMullen, Agriculture and Agri-Food Canada, Lacombe, AB, Canada
- P150 A Comparative Heat Inactivation Study of Indigenous Microflora in Beef with That of *Listeria monocytogenes*, *Salmonella* Serotypes and *Escherichia coli* O157:H7 – VIJAY K. JUNEJA, USDA-ARS-ERRC, Wyndmoor, PA, USA
- P151 Bactericidal Efficacy of GC-100X against Major Foodborne Pathogens and Detaching Effect of It against *Escherichia coli* O157:H7 on Beef – N. H. KWON, S. H. Kim, J. Y. Kim, J. Y. Lim, J. M. Kim, W. K. Jung, K. T. Park, W. K. Bae, K. M. Noh, J. W. Choi, and Y. H. Park, Seoul National University, Seoul, Korea
- P152 *Escherichia coli* O157:H7 Distribution in Beef Processed in a Table-top Bowl-cutter – ROLANDO A. FLORES, Tod Stewart, and Benito Martinez, USDA-ARS-ERRC, Wyndmoor, PA, USA
- P153 Reduction of *Escherichia coli* O157:H7 in Refrigerated Ground Beef by *Lactobacillus* spp. – LACEY M. SMITH, Jason E. Mann, and Mindy M. Brashears, Texas Tech University, Lubbock, TX, USA
- P154 Efficacy of Enrichment Broths Using BAX for Screening Recovery of Freeze-injured *Escherichia coli* O157:H7 in Inoculated Ground Beef – W. C. LIONBERG, L. Restaino, E. W. Frampton, and W. M. Barbour, R & F Laboratories, West Chicago, IL, USA
- P155 Influence of Inoculum Level and Acidic DSC Marination on Inactivation of *Escherichia coli* O157:H7 during Drying and Storage of Beef Jerky – Y. YOON, P. A. Kendall, G. C. Smith, and J. N. Sofos, Colorado State University, Fort Collins, CO, USA
- P156 Nature of *Escherichia coli* O157:H7, *Listeria monocytogenes* and *Lactobacillus sake* Inhibition by Eugenol, Cinnamaldehyde and Sodium Lactate – A. O. Gill and R. A. HOLLEY, University of Manitoba, Winnipeg, MB, Canada
- P157 Occurrence of *Salmonella* on Poultry and Swine Farms – XIN LI, Josh Payne, Fernanda Santos, and Brian Sheldon, North Carolina State University, Raleigh, NC, USA
- P158 Validation of Time and Temperature Values as Critical Limits for Ground Pork Processing and Storage – JASON E. MANN, Mindy Brashears, and Lacey Smith, Texas Tech University, Lubbock, TX, USA
- P159 Validation of Time and Temperature Values as Critical Limits for Pork Fabrication and Storage – JASON E. MANN and Mindy Brashears, Texas Tech University, Lubbock, TX, USA
- P160 Changes in Swine and Cattle Production Practices Since the 1996 PR/HACCP Final Rule – SHERYL C. CATES and Becky L. Durocher, RTI International, Research Triangle Park, NC, USA
- P161 Changes in the Identification and Control of Chemical Hazards Since the 1996 PR/HACCP Rule – ROBERTA A. MORALES et al., Research Triangle Institute, Durham, NC, USA
- P162 Reduction of *Listeria monocytogenes* Populations during Exposure to a Simulated Gastric Fluid following Storage of Inoculated Frankfurters Formulated and Treated with Preservatives – J. D. STOPFORTH, Y. Yoon, J. Samelis, and J. N. Sofos, Colorado State University, Fort Collins, CO, USA

- P163 Control of *Listeria monocytogenes* with Antimicrobials in the Formulation and by Dipping in Organic Acids of Post-processing Inoculated Pork Frankfurters Stored at 10°C in Vacuum Packages – I.M. BARMALIA, I. Geornaras, P. A. Kendall, K. E. Belk, J. A. Scanga, G. C. Smith, and J. N. Sofos, Colorado State University, Fort Collins, CO, USA
- P164 Recovery Rate of *Listeria monocytogenes* from Commercially-prepared Frankfurters during Extended Refrigerated Storage – F. MORGAN WALLACE, Jeffrey E. Call, Anna C. S. Porto, George J. Cocoma, Randall Huffman, and John B. Luchansky, USDA-ARS, Microbial Food Safety Research Unit, Wyndmoor, PA, USA
- P165 Efficacy of Sodium Lactate and Sodium Diacetate Alone or Combined with Pediocin for Controlling *Listeria monocytogenes* in Ready-to-Eat Turkey Roll at 4°C and 10°C – BLEDA BISHA, Aubrey Mendonca, Joseph Sebranek, and James Dickson, Iowa State University, Ames, IA, USA
- P166 A Predictive Model for Growth and Inactivation of *Listeria monocytogenes* in pH-Modified Chicken Salad during Cold Storage – ANN GUENTERT, Richard Linton, Rabi Mohtar, Mark Tamplin, John Luchansky, and Maribeth Cousin, Purdue University, West Lafayette, IN, USA
- P167 Antibiotic, Biochemical, and Genotypic Characterization of Coagulase-positive *Staphylococcus aureus* – WENDY LANG and Leonard Williams, Alabama A&M University, Normal, AL, USA
- P168 Consumer Preferences for Labeling of Not-Ready-to-Eat Meat, Poultry, and Egg Products – HEATHER L. CARTER-YOUNG, Sheryl C. Cates, Katherine M. Kosa, and Robert C. Post, RTI International, Research Triangle Park, NC, USA
- P169 Changes in the Identification and Control of Physical Hazards Since the 1996 PR/HACCP Rule – R. A. MORALES et al., Research Triangle Institute, Durham, NC, USA
- P170 Cell Surface Attachment of *Listeria monocytogenes* on Ready-to-Eat Meats – SALLY C. C. FOONG and James S. Dickson, Iowa State University, Ames, IA, USA
- P171 Combinations of Nisin and Gamma Irradiation for Effective Control of *Listeria monocytogenes* on Meat – H. M. MOHAMED, F. A. Elnawawi, and A. E. Yousef, Ohio State University, Columbus, OH, USA

TUESDAY AFTERNOON – AUGUST 12, 2003

1:30 p.m. – 3:30 p.m.

S13 Assuring Food Safety and Security

Organizers: Jeff Farrar

and Jennifer Thomas

Convenor: Jennifer Thomas

- 1:30 Scientific and Technological Approaches for Counterterrorism of Foods – ART MILLER, FDA-CFSAN, College Park, MD, USA
- 2:00 A Food Processor Perspective of Bioterrorism and Food Security – JENNY SCOTT, NFPA, Washington, D.C., USA
- 2:30 Incident Management Systems and Preparing for Biological Terrorism Threats – STEVE THARRATT, University of California-Davis, Sacramento, CA, USA
- 3:00 The USDA Perspective on Bioterrorism Prevention and Response – JESSE MAJKOWSKI, USDA-FSIS, Washington, D.C., USA

S14 Applied Microbiological Genomics for Food Safety and Quality

Organizer: S. Notermans

Convenor: Tom McMeekin

- 1:30 The Challenge of Genomics in Food Microbiology – STANLEY BRUL, University of Amsterdam/Unilever Research, Amsterdam, The Netherlands
- 2:00 Predictive Microbiology Based on Genomics – S. NOTERMANS, TNO Nutrition and Food Research Institute, Zeist, The Netherlands
- 2:30 Cell-based Assays and Biosensors as the New Tools for the Detection and Quantification in Food Microbiology – PAUL TAKHISTOV, Rutgers University, New Brunswick, NJ, USA
- 3:00 Panel Discussion

S15 *Campylobacter*: A Pathogen in Need of Resolution

Sponsored by the IAFP Foundation Fund

Organizers/Convenors: Robert Brooks and Norman J. Stern

- 1:30 Sources for *Campylobacter* spp. as Determined through Human Case-Control Studies – ROBERT V. TAUXE, CDC, Atlanta, GA, USA
- 2:00 Quality Control and Cultural Methods for Detection and Enumeration of *Campylobacter* spp. – ERIC LINE, USDA-ARS-RRR, Athens, GA, USA

2:15 Non-cultural Detection of *Campylobacter* spp. – KELLI HIETT, USDA-ARS-RR, Athens, GA, USA

2:30 Goals of the Poultry Industry Relative to *Campylobacter* spp. – MICHAEL ROBACH, Wayne Farms LLC, Oakwood, GA, USA

3:00 Application of Quantitative Risk Assessment as a Tool to Understand the Ecology of *Campylobacter* in Poultry and Risk Factors for Human Exposure and Illness – RUFF LOWMAN, Canadian Food Inspection Agency, Nepean, ON, Canada

S16 Microbial Stress Response to Intervention Technologies

Organizer: James Yuan

Convenors: John S. Novak and James Yuan

1:30 Radiation Inactivation of Foodborne Pathogens as Affected by the Physiological State of the Microorganisms and MAP – AUBREY F. MENDONCA, Iowa State University, Ames, IA, USA

1:55 Bacterial Survival Following Synergistic Use of Ozone and Heat – JOHN S. NOVAK, USDA-ARS-ERRC, Wyndmoor, PA, USA

2:15 Resistance of Foodborne Pathogens to Pulsed Electric Fields – HOWARD Q. ZHANG, Ohio State University, Columbus, OH, USA

2:40 Inactivation of Enteric Viruses with Intervention Technologies – GARY P. RICHARDS, Delaware State University, Dover, DE, USA

3:05 High Pressure Processing and Resistance of Sporeformers – DALLAS G. HOOVER, University of Delaware, Newark, DE, USA

S17 Current Issues in Food Toxicology

Organizers/Convenors: Michael W. Pariza and Joseph Scimeca

1:30 Safety of Biotechnology-derived Foods – ROBERT HOLLINGWORTH, Michigan State University, East Lansing, MI, USA

2:00 Safety Standards for Food Contaminants – MICHAEL BOLGER, FDA-CFSAN, College Park, MD, USA

2:30 Functional Food Ingredients: Regulatory and Safety Challenges – J. CRAIG ROWLANDS, Burdock Group, Vero Beach, FL, USA

3:00 Human Subjects Research in Regulatory Policy – PENELOPE A. FENNER-CRISP, ILSI Risk Science Institute, Washington, D.C., USA

T04 Food Handling in the Domestic Food Service Environment

Convenors: Frank Yiannas and Joseph D. Eifert

1:30 T37 Microbiological Risks of Handling Raw Meat in the Domestic Environment – Linda Everis, Gail Betts, Hayley Newsholme, and ROY BETTS, Campden & Chorleywood Food Research Association, Gloucestershire, GL, UK

1:45 T38 Development of a Systems-based Approach to Food Safety – DANIELA QUILLIAM, Carol Selman, John Sarisky, Rick Gelting, and Sharunda Buchanan, CDC-NCEH, Atlanta, GA, USA

2:00 T39 Prevalence of High Risk Egg Handling Practices in Restaurants: An EHS-Net Survey – ROBIN LEE, Mark E. Beatty, April Bogard, Michael-Peter Esko, and Carol Selman, CDC-NCEH, Atlanta, GA, USA

2:15 T40 A Review of Operational Elements of Retail Food Protection Programs Across States – DANIELA QUILLIAM, Carol Selman, and Robin Lee, CDC, Atlanta, GA, USA

2:30 T41 Review of Studies on Food Worker Food Handling – LAURA R. GREEN and Carol Selman, RTI International, Atlanta, GA, USA

2:45 T42 Restaurant Workers' and Managers' Perceptions of Facilitators and Barriers to Safe Food Handling – LAURA R. GREEN, Carol Selman, and the EHS-Net Working Group, RTI International, Atlanta, GA, USA

3:00 T43 A Cooperative Approach to Retail Food Safety – JON-MIKEL WOODY, FDA-CFSAN, College Park, MD, USA

3:15 T44 The Effect of Inaccurate Risk Assessment in HACCP Programs on Manufacturers Operational Performance – DAVID LLOYD, University of Wales Institute-Cardiff, Cardiff, South Glamorgan, Wales, UK

Plenary Session – 3:45 p.m.

Breaking the Cycle of Foodborne Illness: The War on Pathogens

Dr. Elsa A. Murano, Under Secretary for Food Safety, USDA, Washington, D.C., USA

Business Meeting – 4:45 p.m. – 5:30 p.m.

WEDNESDAY, AUGUST 13, 2003

8:30 a.m. – 12:00 p.m.

S18 Science-based Shelf-life Dating of Ready-to-Eat Refrigerated Foods

Sponsored by ILSI, N.A.

Organizer: Catherine Nnoka

Convenors: Jean Anderson and Jenny Scott

8:30 History of Use and Consumer Perception of Code Dates – JILL HOLLINGSWORTH, Food Marketing Institute, Washington, D.C., USA

9:00 Microbiological Concerns Related to Refrigerated Ready-to-Eat Foods – MICHAEL P. DOYLE, University of Georgia, Griffin, GA, USA

9:30 Principles for Determining If a Product Requires Shelf-life Dating – RICHARD C. WHITING, FDA-CFSAN, College Park, MD, USA

10:00 Break

10:30 Protocols to Establish and Validate Safety-based Shelf-life Dating – MICHAEL G. ROMAN, Kraft Foods NA, Glenview, IL, USA

11:00 Alternatives to Safety-based Shelf-life Dating – TED LABUZA, University of Minnesota, St. Paul, MN, USA

11:30 European Perspectives on Shelf-life Dating – ROY P. BETTS, Campden and Chorleywood Food Research Association, Gloucestershire, UK

S19 All the Latest Jazz – Recent Foodborne Disease Outbreaks

Sponsored by the IAFP Foundation Fund

Organizer: Jeff Farrar

Convenors: Jeff Farrar and Jack Guzewich

8:30 Multistate Listeriosis Outbreak Associated with Turkey Deli Meat – United States, 2002 – SAMI GOTTLIEB, CDC, Atlanta, GA, USA and DAVID GOLDMAN, USDA, Washington, D.C., USA

9:00 Tomatoes Sicken Hundreds: Multistate Outbreak of *Salmonella* Newport Infections – Eastern and Central United States, July–November 2002 – KATRINA KRETSINGER, CDC, Atlanta, GA, USA and J. DOUGLAS PARK, FDA, College Park, MD, USA

9:30 Behavior of *Salmonella* on and in Tomatoes – LARRY BEUCHAT, University of Georgia, Griffin, GA, USA

10:00 Break

10:30 Hyperendemic Botulism – Republic of Georgia, 1980–2002 – KATRINA KRETSINGER, CDC, Atlanta, GA, USA

11:00 *Salmonella kottbus* in Sprouts – KEVIN WINTHROP, California Dept. of Health Services, Berkeley, CA, USA and MARY PALUMBO, California Dept. of Health Services, Sacramento, CA, USA

11:30 *Salmonella* Poona in Cantaloupes – What Have We Learned – SHERRI MCGARRY, FDA, College Park, MD

S20 Food on the Move

Sponsored by the IAFP Foundation Fund

Organizer/Convenor: Thomas L. Schwarz

8:30 What FDA Does to Keep Travelers Safe and Healthy – DEAN DAVIDSON, FDA-CFSAN, College Park, MD, USA

9:00 Charting a Healthier Course: USPHS's Vessel Sanitation Program – DAVID L. FORNEY, CDC, Atlanta, GA, USA

9:30 USPHS, FDA Food Code Sets Sail: The Global Launching of the Highest Retail Food Safety Standards – CHARLES S. OTTO, CDC, Atlanta, GA, USA

10:00 Break

10:30 The New Worldwide Food Safety Standards for the Airline Industry – JULIE BUTNER, Compass Group, Fort Worth, TX, USA

11:00 Ship of Stools: Diarrheal Outbreaks on Cruise Ships – ELAINE H. CRAMER, CDC, Vancouver, BC, Canada

11:30 What's Cookin' in Space – TONY POMETTO, NASA Food Technology, Commercial Space Center, Ames, IA, USA

S21 Aquaculture: Safety and Quality Issues

Sponsored by the IAFP Foundation Fund

Organizers/Convenors: Linda Andrews and Brian Himelbloom

8:30 Good Aquaculture Practices and the Role of HACCP – JUAN SILVA, Mississippi State University, Mississippi State, MS, USA

9:00 Advances in Reducing the Off-flavors in Farm-raised Catfish – CASEY GRIMM, USDA-ARS-SRRC, New Orleans, LA, USA

9:30 Modified Atmosphere Packaging of Aquacultured Seafood Products – JUAN SILVA, Mississippi State University, Mississippi State, MS, USA

10:00 Break

- 10:30 Chemical and Drug Use in Aquaculture – ROSALIE SCHNICK, Michigan State University, North Central Regional Aquaculture Center, LaCrosse, WI, USA
- 11:00 Pesticides and Environmental Organic Pollutants in Farmed Fish – CHARLES SANTERRE, Purdue University, West Lafayette, IN, USA
- 11:30 International Perspective on Aquaculture – PETER K. BEN EMBAREK, WHO, Geneva, Switzerland
- T05 Foodborne Pathogens**
Convenors: Douglas L. Marshall and Gregory R. Siragusa
- 8:30 Sensitivity of *Escherichia coli* O157:H7 to Industrial Alkaline Cleaners and Subsequent Exposure to Heat – MANAN SHARMA and Larry R. Beuchat, University of Georgia, Griffin, GA, USA
- 8:45 Antibiotic Susceptibility and Cross Contamination of Enteric Bacteria Isolated from Feedlot Cattle and Their Carcasses – WADE M. FLUCKEY, Guy H. Loneragan, and Mindy M. Brashears, Texas Tech University, Lubbock, TX, USA
- 9:00 Determining the Prevalence of *Escherichia coli* O157 in Cattle and Beef from the Feedlot to the Cooler – J. R. RANSOM, J. N. Sofos, K. E. Belk, G. A. Dewell, K. S. McCurdy, G. C. Smith, and M. D. Salman, Colorado State University, Fort Collins, CO, USA
- 9:15 Evaluation of Cetylpyridinium Chloride for the Reduction of Bacterial Populations on Beef Hide Surfaces – J. R. RANSOM, J. N. Sofos, K. E. Belk, I. Geornaras, and G. C. Smith, Colorado State University, Fort Collins, CO, USA
- 9:30 Trends of *Salmonella* Serotypes in the United States: FoodNet, 1996–2001 – STEPHANIE DELONG, Luenda Charles, Patricia Fields, Paul Cieslak, Nellie Dumas, Karen Giesecker, Timothy Jones, Ruthanne Marcus, Patricia Ryan, Suzanne Segler, Ellen Swanson, Duc Vugia, and Matthew Moore, CDC, Atlanta, GA, USA
- 9:45 Persistence of *Salmonella* Enteritidis PT₄ and *S. Typhimurium* DT104 on a Commercial Laying Farm – ROB H. DAVIES, Veterinary Laboratories Agency-Weybridge, Addlestone, Surrey, UK
- 10:00 Break
- 10:30 Detection and Enumeration of *Salmonella* Enteritidis in Ice Cream Associated with an Outbreak: Comparison of Conventional and Rapid Methods – KUN-HO SEO, Iris E. Valentin-Bon, Robert E. Brackett, and Glen R. Henderson, FDA-CFSAN, College Park, MD, USA
- 10:45 Longitudinal Studies on *Listeria* in Smoked Fish Plants: Impact of Employee Training and Intervention Strategies on Contamination Patterns – VICTORIA LAPPI, Joanne Thimothé, Virginia N. Scott, Kenneth Gall, and Martin Wiedmann, Cornell University, Ithaca, NY, USA
- 11:00 The Effects of Soil and Surface-type on the Survival of *Listeria monocytogenes* in the Presence of Condensate – JOHN ALLAN and Jeffrey Kornacki, University of Georgia, Griffin, GA, USA
- 11:15 Effect of Inoculum Size on the Growth/No Growth Boundary of *Listeria monocytogenes* – KONSTANTINO P. KOUTSOUMANIS, Patricia A. Kendall, and John N. Sofos, Colorado State University, Fort Collins, CO, USA
- 11:30 Effect of Intrinsic Factors on the Hemolytic Activity of *Listeria monocytogenes* – V. F. ALVES and E. C. P. De Martinis, Faculdade de Ciências Farmacêuticas de Ribeirão Preto-USP, Ribeirão Preto, São Paulo, Brazil
- 11:45 Withdrawn
- P04 Jambalaya**
 9:00 a.m. – 12:00 p.m.
 (Authors present 9:30 a.m. – 11:30 a.m.)
Convenors: Joshua Gurtler and Dharmendra Singh Pavar
- Risk/Modeling**
- P172 Safe Prediction Zone, a New Method for Validation of Predictive Models – T. P. OSCAR, USDA-ARS, Princess Anne, MD, USA
- P173 Development and Evaluation of a Mathematical Model for the Effect of Temperature, pH, NaCl and Sodium Lactate on the Surface Growth Limits of *Listeria monocytogenes* – KONSTANTINOS P. KOUTSOUMANIS, Patricia A. Kendall, and John N. Sofos, Colorado State University, Fort Collins, CO, USA
- P174 Enumeration of *Salmonella* with the Polymerase Chain Reaction BAX System and Simulation Modeling – T. P. OSCAR, USDA-ARS, Princess Anne, MD, USA
- P175 Modeling the Effects of Food Handling Practices on the Incidence of Foodborne Illness – DAVID L. KENDALL and Angela Ritzert, RTI International, Abingdon, VA, USA

- P176 A Quantitative Risk Assessment Model for *Salmonella* and Whole Chickens at Retail – T. P. OSCAR, USDA-ARS, Princess Anne, MD, USA
- P177 Quantitative Microbial Risk Assessment of the Sprout Production Process – REBECCA MONTVILLE and Don Schaffner, Rutgers University, New Brunswick, NJ, USA
- P178 Generalized Extreme Value Distributions for Risk Assessment: A Monte Carlo Study – Carlos L. Cintora and VALERIA J. DAVIDSON, University of Guelph, Guelph, ON, Canada
- P179 Risk Assessment and Risk Communication for *Listeria monocytogenes* in Ready-to-Eat Foods with a Focus on Food Handling at Home – HONG YANG, Sheryl Cates, Toby Ten Ecyk, Sumeet Patil, Roberta Morales, Lee-Ann Jaykus, and Peter Cowen, North Carolina State University, Raleigh, NC, USA

Sanitation/Hygiene

- P180 *Lactobacillus casei* Viability after Impregnation into Apple Porous Structure – Patricia Ramírez-Morales, M. Teresa Jiménez-Munguía, Alvaro Argáiz, Jorge Welte-Chanes, Enrique Palou and AURELIO LÓPEZ-MALO, Universidad de las Américas-Puebla, Cholula, Puebla, Mexico
- P181 Inhibitory Activity of *Bifidobacterium longum* HY8001 against *Salmonella enterica* serovar Typhimurium DT104 – S. H. KIM, N. H. Kwon, J. Y. Kim, J. Y. Lim, J. M. Kim, W. K. Bae, K. M. Noh, K. T. Park, W. K. Jung, Y. J. Baek, K. S. Lim, and Y. H. Park, Seoul National University, Seoul, Korea
- P182 Characterization of *Listeria innocua* Biofilm Formation Using Tn917 Transposon Mutagenesis – W. K. SHAW, Jr. and L. A. McLandsborough, University of Massachusetts, Amherst, MA, USA
- P183 Characterization of a Swarming Phenotype of *Listeria innocua* on Semi-solid Surfaces – EMMANOUIL APOSTILIDES and Lynne McLandsborough, University of Massachusetts, Amherst, MA, USA
- P184 Comparing the Efficacy between Single and Double Pulse Pressure-assisted Thermal Processing on Inactivation of *Bacillus stearothermophilus* ATCC 10149 Spores – E. PATAZCA, V. M. Balasubramaniam, and V. Rasanayagam, National Center for Food Safety and Technology at Illinois Institute of Technology, Summit Argo, IL, USA

- P185 Starvation-induced Cross-protection of *Escherichia coli* O157:H7 against Electron-beam Irradiation in 0.85% Saline and in Apple Juice – SUJIN S. PAIK, Aubrey Mendonca, Bonita Glatz, and Mark Gleason, Iowa State University, Ames, IA, USA
- P186 Inhibition of Selected Fungi by Psoralen – Long Wave Ultraviolet Light – Ivonne Audiffred, Victoria Pérez-Petrone, Fidel T. Vergara-Balderas, ENRIQUE PALOU, and Aurelio López-Malo, Universidad de las Américas-Puebla, Cholula, Puebla, Mexico
- P187 Inhibitory Activity of *Lactobacillus reuteri* SD 2112 against Vero Cytotoxin of *Escherichia coli* O157:H7 – S. H. KIM, N. H. Kwon, J. Y. Kim, J. Y. Lim, J. M. Kim, W. K. Bae, K. M. Noh, K. T. Park, W. K. Jung, H. J. Kang, D. S. Lee, I. B. Kwon, and Y. H. Park, Seoul National University, Seoul, Korea
- P188 Withdrawn
- P189 Effect of Combined Protamine and Heat Treatments on Survival and Release of Surface Proteins of Wild-type and Protamine Resistant *Listeria monocytogenes* Scott A – Clarissa Schwab and LISBETH TRUELSTRUP HANSEN, Dalhousie University, Halifax, NS, Canada
- P190 Inactivation of *Escherichia coli* O157:H7, *Salmonella* and *Listeria monocytogenes* in Frozen Ground Beef Patties by Electron Beam Irradiation – JAMES KENNEDY, Wafa Birbari, and William Brown, ABC Research Corporation, Gainesville, FL, USA
- P191 Fate of *Listeria monocytogenes* following Electron-beam Irradiation in Ready-to-Eat Turkey Roll Formulated with Pediocin Alone or Combined with Sodium Lactate and Sodium Diacetate – BLEDDAR BISHA, Aubrey Mendonca, Joseph Sebranek, and Dong Ahn, Iowa State University, Ames, IA, USA
- P192 Withdrawn
- P193 Effects of Drying Methods, Gamma Irradiation and Storage on the Carotenoids of Paprika – AYHAN TOPUZ and Feramuz Ozdemir, University of Akdeniz, Antalya, Turkey
- P194 Effect of Drying Methods, Gamma Irradiation and Storage on the Capsaicinoids of Paprika – Ayhan Topuz and FERAMUZ OZDEMIR, University of Akdeniz, Antalya, Turkey
- P195 Evaluation of the VERicleen® Food Residue Surface Test as a Means to Monitor Surface Hygiene – GINNY MOORE and Chris Griffith, University of Wales Institute-Cardiff, Cardiff, UK

Consumer Education

- P196 Evaluation of Hygiene Training within the Vending Industry – JAYNE DRAKE and Adrian Peters, University of Wales Institute-Cardiff, Cardiff, UK
- P197 From Reactive to Proactive – The Prevention of HACCP Parameters and Related Equipment Failure – GIDEON ZEIDLER, University of California, CA, USA
- P198 The Co-relationship between High Technical Food Safety Standards and Operating Cost Effectiveness – GORDON W. HAYBURN and David Lloyd, University of Wales Institute-Cardiff, Cardiff, Wales, UK
- P199 The Comparison of HACCP Application and Non-application at Food Service Establishments in Korea by Microbiological Hazard Analysis – JE-MYUNG LEE, Won-Bo Shim, and Duck-Hwa Chung, Graduate School of Gyeongsang National University, Chinju, Gyeongnam, Korea
- P200 Microbiological Quality Evaluation to the HACCP System of the Bakery Products at Bakeries – SUNG-HEE KWON, Duck-H Chung, Sang-Suk Oh, and Ae-Son Om, Hanyang University, Seoul, South Korea
- P201 Verification of a Food Safety Auditing Tool for Foodservice Establishments Based on Microbiological Analysis – TONG-KYUNG KWAK YUM, Duck Hwa Chung, Young Jae Kang, Hye Ja Chang, and Kyung Mi Lee, Yonsei University, Seoul, Korea
- P202 Analysis of Critical Control Points through Field Assessment of Sanitation Management Practices in Foodservice Establishments – Tong-Kyung Kwak Yum, KYUNG-MI LEE, Hye-Ja Chang, Wansoo-Hong, Hye-Kyung Moon, and Young-Jae Kang, Yonsei University, Seoul, Korea
- P203 Usage Status Survey on Some Essential Facility, Equipment, and Documentary Records for HACCP Implementation in Contracted Foodservices – HYE-KYUNG MOON and Kyung Ryu, Changwon National University, Changwon, KyungNam, Republic of Korea
- P204 Efficacy Quenching of Chlorine Dioxide and Quaternary Ammonium-containing Sanitizers by Organic Matter – M. E. Peta, D. Lindsay, V. S. Brozel, and A. VON HOLY, University of Witwatersrand, Johannesburg, South Africa
- P205 Sandia National Laboratories Decon Foam-100 as a Sanitizer against *Listeria monocytogenes* Mixed Culture Biofilms – J. M. BIEKER, R. K. Phebus, H. Thippareddi, D. Boyle, J. Marsden, and J. E. Boyer, Jr., Kansas State University, Manhattan, KS, USA
- P206 Recovery of *Listeria monocytogenes* and *Pseudomonas putida* from Food Contact Surfaces after Ozone Exposure – ARTURO TANUS, Randall Phebus, Larry Franken, and Michelle Gordon, Kansas State University, Manhattan, KS, USA
- P207 A Comparison of Attachment and Recovery Methods for Microorganisms Attached on Various Food Contact Surfaces – NICOLE MAKES, Claudia Rodriguez, Susanne Keller, and Sadhana Ravishankar, NCFST, Summit-Argo, IL, USA
- P208 Comparison of Cell Attachment and Spore Formation by *Bacillus cereus* DL5 in Minimal Nutrient Growth Medium – D. Lindsay, V. S. Brozel, and A. VON HOLY, University of the Witwatersrand, Johannesburg, South Africa
- P209 Bacterial Contamination of Commercial Yeast – S. S. O'Brien, B. A. Tessoroff, M. Brodie, D. Lindsay, and A. VON HOLY, University of the Witwatersrand, Johannesburg, South Africa
- P210 Assessment of Bacterial Populations on Equipment Surfaces in a Processed Meat Slicing Operation by Different Techniques – M. A. Kotze, D. Lindsay, and A. VON HOLY, University of the Witwatersrand, Johannesburg, South Africa
- P211 Inactivation of GFP-transformed *Escherichia coli* O157:H7 on Whole Apples following Immersion in Selected Chemical Sanitizers at 25°C and 55°C – TOSHIBA TRAYNHAM, Aubrey Mendonca, Bonita Glatz, and Mark Gleason, Iowa State University, Ames, IA, USA
- P212 Optimization of Chlorine Treatments and the Effects on Survival of *Salmonella* spp. on Tomato Surfaces – KELLY D. FELKEY, Keith R. Schneider, Douglas L. Archer, and Jerry A. Bartz, University of Florida, Richmond, VA, USA
- P213 Meta-analysis of the Microbiological Quality of Food in Relation to HACCP and Food Hygiene Training in Food Premises in the United Kingdom, 1997–2002 – CHRISTINE L. LITTLE and Robert T. Mitchell, Communicable Disease Surveillance Centre, London, UK
- P214 The Microbial Ecology of High Risk, Chilled Food Factories; Evidence for Persistent *Listeria* spp. and *Escherichia coli* Strains – JOHN HOLAH, Jon Bird, and Karen Hall, Campden & Chorleywood Food Research Association, UK
- P215 Sanitary Standard Operation Procedures in a Tortilleria at Xalapa, Veracruz, México – PAOLA SABINA CONTRERAS ROMO, Laboratorio de Alta Tecnologia de Xalapa, SC Universidad Veracruzana, Xalapa, Veracruz, Mexico

- P216 The Increased Effectiveness of Peracetic Acid with a Foaming Additive on Fungal and Bacterial Spores – CRYSTAL NESBITT and Mary Homan, FMC Corporation, Princeton, NJ, USA
- P217 Altered Sensitivity of Acid and Cold Adapted *Listeria innocua* to the Quaternary Ammonium Compound Cetrimide – MARK A. MOORMAN and James J. Pestka, Michigan State University, Battle Creek, MI, USA
- P218 Removal of *Pseudomonas putida* Biofilm and Associated Extracellular Polymeric Substances from Stainless Steel by Use of Alkali Cleaning – Katerina Antoniou and JOSEPH F. FRANK, University of Georgia, Athens, GA, USA

Epidemiology

- P219 Outbreak Alert!: A Compilation and Analysis of Food-Poisoning Outbreaks – CAROLINE SMITH DEWAAL, Center for Science in the Public Interest, Washington, D.C., USA
- P220 Factors That Influence the Efficacy of Risk Communication and Consumer Perceptions of Sources of Food Safety Education – E. C. REDMOND and C. J. Griffith, University of Wales Institute-Cardiff, Cardiff, South Wales, UK
- P221 The Cost Effectiveness of a Targeted Disinfection Program in Household Kitchens to Prevent Foodborne Illnesses in the United States, Canada, and the United Kingdom – STEVEN B. DUFF, Elizabeth A. Scott, Michael S. Mafilios, Ewen C. Todd, Leonard R. Krilov, Alasdair M. Geddes, and Stacey J. Ackerman, Covance Health Economics and Outcomes Services Inc., San Diego, CA, USA
- P222 Consumer Attitudes and Perceptions towards Food Safety in the Domestic Kitchen – E. C. REDMOND, C. J. Griffith, and A. C. Peters, University of Wales Institute-Cardiff, Cardiff, South Wales, UK
- P223 Influence of Fingernail Length and Type on Removing Feline Calicivirus from the Nail Regions Using Different Hand Washing Interventions – C.-M. LIN, H.-K. Kim, E. H. Thurber, M. P. Doyle, and B. S. Michaels, University of Georgia, Griffin, GA, USA
- P224 Quantification of Risks in Catering Establishments – PIRKKO TUOMINEN and Riitta Majjala, National Veterinary and Food Research Institute, Helsinki, Finland

Residues

- P225 Molecule Cloning, Expressing, and Characterization of a Recombinant Antibody against Sulfamethazine – ZHENG-YOU YANG, Ji-Hun Kim, and Duck-Hwa Chung, Graduate School of Gyeongsang National University, Chinju, Gyeongnam, Korea

- P226 Assessment of Mutagenicity and Carcinogenicity Effects of Plastic Bags and Disposable Food Containers in the *Salmonella*/Microsome Test – MARYAM TOHIDPOUR, Sedigheh Mehrabian, Mojgan Emtiazjoo, and Homa Assempour, Azad Islamic University, Tehran, Iran
- P227 Using a Viral Symbiont to Evaluate Water Samples for the Presence of Viable *Cryptosporidium parvum* Oocysts – K. E. KNIEL, M. C. Jenkins, J. Higgins, J. Trout, and R. Fayer, USDA-ARS, Beltsville, MD, USA

Mycotoxins

- P228 Efficacy of Hydrogen Peroxide for Reducing Post-harvest Fusarium Infection in Malting Barley – BALASUBRAHMANYAM KOTTAPALLI, C. E. Wolf-Hall, and P. B. Schwarz, North Dakota State University, Fargo, ND, USA
- P229 Effects of Cooking and Processing on the Reduction of Aflatoxin Content in Corn – JONG-GYU KIM and Hyun-Jong Yeo, Keimyung University, Daegu, Korea
- P230 Natural Occurrence of Aflatoxin and Fumonisin in Corn and Rice from Venezuela and Its Mycoflora – AMAURY MARTÍNEZ, Claudio Mazanni, Rosa Raybaudi, Odalis Luzón, and Rafael Alvarado, Universidad Central de Venezuela, Caracas, Venezuela

Antibiotic Resistance

- P231 Identification and Polymorphism of SopE in Isolates of *Salmonella enterica* – A Factor That May Contribute to the Appearance of Multi-resistant Clones Associated with Cases of Food Poisoning in England and Wales – KATIE HOPKINS and E. John Threlfall, Central Public Health Laboratory, London, UK
- P232 Trends in Multiple Antibiotic Resistance of *Salmonella* Virchow – HADAS SOLNIK and Sima Yaron, Technion, Haifa, Israel

WEDNESDAY AFTERNOON – AUGUST 13, 2003 1:30 p.m. – 5:00 p.m.

S22 The Evolution of Foodborne Pathogens

Sponsored by ILSI, N.A.

Organizer: Catherine Nnoka
Convenors: Marguerite Neill
and Martin Wiedmann

- 1:30 Understanding the Evolution of Foodborne Pathogens – Challenges and Promise – TOM CEBULA, FDA-CFSAN, Laurel, MD, USA
- 2:00 Evolution of *Escherichia coli* O157:H7 and other *E. coli* – TOM WHITTAM, Michigan State University, East Lansing, MI, USA

- 2:30 Evolution of *Salmonella* Virulence and Host Adaptation – ANDREAS BAEUMLER, Texas A&M University, College Station, TX, USA
- 3:00 Break
- 3:30 MLST (Multilocus Sequence Typing) for Evolutionary Analyses and Outbreak Tracking – MARTIN MAIDEN, University of Oxford, Oxford, UK
- 4:00 Molecular Evolution of *Listeria monocytogenes* – MARTIN WIEDMANN, Cornell University, Ithaca, NY, USA
- 4:30 Panel Discussion
- S23 Natural Antimicrobials – Current Trends and Future Perspectives**
Organizers/Convenors: Vijay K. Juneja and Sadhana Ravishankar
- 1:30 Natural Antimicrobials: Back to Our Roots – P. MICHAEL DAVIDSON, University of Tennessee, Knoxville, TN, USA
- 2:00 Animal-derived Antimicrobials – ERIC A. JOHNSON, University of Wisconsin-Madison, Wisconsin, WI, USA
- 2:30 Plant and Microbial-derived Antimicrobials – SADHANA RAVISHANKAR, NCFST, Summit-Argo, IL, USA
- 3:00 Break
- 3:30 Effectiveness of Antimicrobial Food Packaging Materials – KAY D. COOKSEY, Clemson University, Clemson, SC, USA
- 4:00 Industrial Perspectives on Natural Antimicrobials – JOSEPH D. MEYER, Kraft Foods, East Hanover, NJ, USA
- 4:30 International Regulatory Perspectives for Natural Antimicrobials – BARBARA J. PETERSEN, Novigen Sciences, Inc., Washington, D.C., USA
- S24 Risk Communication – Putting Food Safety in Perspective**
Organizer: Tony Flood
Convenor: Dave Schmidt
- 1:30 Understanding Risk Communication – DAVID ROPEIK, Harvard Center for Risk Analysis, Boston, MA, USA
- 2:15 Messages Heard: The Role of Media in Food Safety Coverage – To be announced
- 3:00 Break
- 3:30 Debunking the Myths, Speaking with Science – CARY FRYE, International Dairy Foods Association, Washington, D.C., USA
- 4:00 Risk: A Physician's Perspective – DANIEL H. JOHNSON, JR., Clearview Medical Imaging, Metairie, LA, USA
- 4:30 Applying Principles of Risk Communication to Food Issues – DAVE SCHMIDT, International Food Information Council, Washington, D.C., USA
- S25 Emerging Issues in Water Quality for the Food Industry**
Sponsored by Environmental Health Laboratories (EHL) a Division of Underwriters Laboratories, IAFP Foundation Fund, Quality Flow Inc., and Underwriters Laboratories Environmental and Public Health
Organizer: Susan K. McKnight
Convenors: Susan K. McKnight and Kathleen Rajkowski
- 1:30 Overview – SUSAN K. MC KNIGHT, Quality Flow, Inc., Northbrook, IL, USA
- 1:40 Microbial Contaminants in Drinking Water – KELLY A. REYNOLDS, University of Arizona, Tucson, AZ, USA
- 2:10 Impact of Animal Agriculture on Microbial Water Quality – JEANETTE THURSTON-ENRIQUEZ, USDA-ARS, Lincoln, NE, USA
- 2:40 Issues Concerning the Quality and Safety of Water Used in the Food Industry – JIM VAN VOOREN, Environmental Health Laboratories, Underwriters Laboratories, South Bend, IN, USA
- 3:00 Break
- 3:30 Biofilm in the Food Industry: Affect on Water Quality and Product Safety – ADRIAN PETERS, University of Wales Institute, Cardiff, UK
- 4:00 Food Quality and Foodborne Disease: What is Water's Role? – KRISTINA D. MENA, University of Texas Health Science Center at Houston, School of Public Health, El Paso, TX, USA
- 4:30 Water Treatment Technologies for the Food Industry – PETER M. KENNEDY, Quality Flow Inc., Northbrook, IL, USA
- T06 Risk Modeling**
Convenors: Donald W. Schaffner and Aamir Fazil
- 1:30 FSIS *Listeria* Risk Assessment: Dynamic In-plant Model to Evaluate the Effectiveness of Testing Food Contact Surfaces – JANELL KAUSE, Daniel Gallagher, and Eric Ebel, USDA-FSIS-OPHS-RAD, Washington, D.C., USA
- 1:45 Withdrawn
- T58

- 2:00 Application of a Safety Monitoring and
T59 Assurance System for Minimizing the Risk of Listeriosis Associated with Cooked Ham - K. KOUTSOUMANIS, P. S. Taoukis, and G. J. E. Nychas, Aristotle University of Thessaloniki, Thessaloniki, Greece
- 2:15 Predictive Modeling of Spoilage of Fresh Meat:
T60 The Effect of Temperature and Modified Atmosphere Packaging - P. N. SKANDAMIS, V. Iliopoulos, N. Chorianopoulos, E. Tsigarida, and G. J. E. Nychas, Agricultural University of Athens, Athens, Votanikos, Greece
- 2:30 Quantifying Robustness of a Microbial Growth
T61 Model - DANILO T. CAMPOS, Bradley P. Marks, Mark L. Tamplin, and Mark R. Powell, Michigan State University, East Lansing, MI, USA
- 2:45 Bayesian Synthesis of a Pathogen Growth Model
T62 - MARK POWELL, Mark Tamplin, and Bradley Marks, USDA, Washington, D.C., USA
- 3:00 Break
- 3:30 Fuzzy and Statistical Techniques for Food Safety
T63 Risk Assessment - V. J. DAVIDSON and J. Ryks, University of Guelph, Guelph, ON, Canada
- 3:45 Risk Assessment in Pork Production: Modeling
T64 Porkborne *Salmonella* Risk from Farm to Pork - XAUNLI LIU, Gay Miller, and Paul McNamara, University of Illinois at Urbana-Champaign, Urbana, IL, USA
- 4:00 Quantitative Risk Assessment of *Vibrio*
T65 *parahaemolyticus* in Bloody Clams in Southern Thailand - FUMIKO KASUGA, Akio Yamamoto, Jun-fichiro Iwahori, Varaporn Vuddhakul, Wilawan Jaroenjittrakul, Sineenart Kalnawakul, Ashrafuzzaman Chowdhury, Mika Shigematsu, Ken Osaka, Hajime Toyofuku, Shigeki Yamamoto, and Mitsuaki Nishibuchi, National Institute of Health Sciences, Setagaya-ku, Tokyo, Japan
- 4:15 Quantitative Risk Assessment for Transmission
T66 of *Cryptosporidium* or *Giardia* in Norway by Consumption of Contaminated Mung Bean Seed Sprouts - Lucy Robertson, JUDY D. GREIG, Bjørn Gjerde, and Aamir Fazil, Health Canada, Guelph, ON, Canada
- 4:30 Biogenic Amines Production by Bacteria
T67 Isolated from Herring (*Clupea harengus*) - FAITH OZOGUL T67 and Abdurrahman Polat, University of Cukurova, Adana, Turkey
- 4:45 Mechanistic Dose-response Modeling for
T68 Microbial Risk Assessment - Robert L. Buchanan, Margaret E. Coleman, Darcy Hanes, Arie Havelaar, Mark D. Sobsey, Phillip I. Tarr, ISABEL WALLS, and H. Kirk Ziegler, ILSI Risk Science Institute, Washington, D.C., USA
- P05 Produce and Seafood Microbiology**
2:00 p.m. - 5:00 p.m.
(Authors present 2:30 p.m. - 4:30 p.m.)
Convenors: John Allen and Michelle Danyluk
- P233 Comparison of Several RNA Extraction Methods for the Recovery of Hepatitis A Virus from Fresh and Frozen Raspberries - JULIE BRASSARD, Yvon-Louis Trottier, Alain Houde, and Carole Simard, Canadian Food Inspection Agency, Saint-Hyacinthe, QC, Canada
- P234 Survival of *Shigella sonnei* during Desiccation on Surfaces is Dependent Upon Density of Inoculum and Inoculum Carrier - Stephan Flessa, Rudi F. Vogel, and LINDA J. HARRIS, University of California-Davis, Davis, CA, USA
- P235 Attachment of *Shigella sonnei* Suspended in Irrigation Water to the Surfaces of Parsley and Cilantro Leaves - GLORIA TETTEH and Trevor Suslow, University of California-Davis, Davis, CA, USA
- P236 Metabiotic Interactions of Plant Pathogenic
DSC Molds and *Salmonella* Poona on Intact and Wounded Cantaloupe Rind - GLENNER M. RICHARDS and Larry R. Beuchat, University of Georgia, Griffin, GA, USA
- P237 Effect of Irrigation Methods and Environmental Conditions on the Contamination and Survival of Enteric Microorganisms on Cantaloupe - SCOTT W. STINE, Inhong Song, Christopher Y. Choi, and Charles P. Gerba, University of Arizona, Tucson, AZ, USA
- P238 Effect of Electron Beam Irradiation on the
DSC Microbiological and Sensory Characteristics of Fresh-cut Cantaloupe Packed in Modified Atmosphere Packages - MANGESH P. PALEKAR, Gabriel Rodriguez, Elisa Cabrera, Ahmad Kalbasi, Alejandro Castillo, Texas A&M University, College Station, TX, USA
- P239 Incidence of *Listeria* spp. and *Salmonella* spp. on the Surface of Fresh Melons, Watermelons and Papayas, Using the Tecra Visual Immunoassay and Cultural Procedures for Their Detection - ANA LUCIA PENTEADO and Mauro F. F. Leitao, Universidade Estadual de Campinas, Campinas, São Paulo, Brazil
- P240 Physical and Chemical Treatments for Control
DSC of *Salmonella* on Cantaloupe Rinds - VIVIAN ANN RASH and David A. Golden, University of Tennessee, Knoxville, TN, USA
- P241 Fine Scale Measurement of Fruit Surface Area - JOSEPH EIFERT, Torbjorn Bergstrom, Christopher Brown, and Fletcher Arritt, Virginia Tech, Blacksburg, VA, USA

- P242 Microflorae of Orange Surfaces and Juice from Fruit for Processing – Renée Goodrich and MICKEY PARISH, University of Florida, Lake Alfred, FL, USA
- P243 Survival of Pathogenic and Spoilage Microorganisms in Orange Juice as Influenced by Calcium Supplements – JINRU CHEN, Jui-Yueh Yeh, and Joy Adams, University of Georgia, Griffin, GA, USA
- P244 DSC Effects of Apple Development Stages on the Internalization of *Escherichia coli* O157:H7 as Observed under Field and Laboratory Conditions – M. L. HEREFORD, S. S. Sumner, R. C. Williams, M. Pierson, R. Marini, R. Worboro, and D. Kang, Virginia Tech, Blacksburg, VA, USA
- P245 Modeling of *Escherichia coli* O157:H7 Inactivation by UV Irradiation and Different pHs in Apple Cider – ARMANDO QUINTERO-RAMOS, John Churey, Phil Hartman, John Barnard, and Randy W. Worobo, Cornell University, Geneva, NY, USA
- P246 DSC The Efficacy of Antimicrobial Treatments for the Inhibition of *Alicyclobacillus acidoterrestris* in Apple and Tomato Juices – ANGELA D. HARTMAN, Robert C. Williams, Susan S. Sumner, and Bruce W. Zoecklein, Virginia Tech, Blacksburg, VA, USA
- P247 DSC Survival of *Listeria monocytogenes* in Fruit Juices during Refrigeration and Temperature-abusive Storage – CHRISTINE L. PIOTROWSKI, Robert C. Williams, Susan S. Sumner, and Joseph E. Marcy, Virginia Tech, Blacksburg, VA, USA
- P248 Simultaneous Determination of Multi-pesticide Residues in Vegetables – MIN HUANG, Sharon L. Melton, and F. Ann Draughon, University of Tennessee-Knoxville, Knoxville, TN, USA
- P249 Reduction of Cyanide Contents of Grains, Beans and Vegetables by Thermal Treatment – KIHWAN PARK, Young Jo, Eun Kim, Sang Oh, and Kwang-Ro Yoon, Chung-Ang University, Ansong, Kyonggi, South Korea
- P250 Microbial Quality of Parsley and Welsh Onion Mixture Minimally Processed Commercialized at the Supermarkets in Campinas/SP, Brazil – SILVANA SREBERNICH and Neliane Silveira, Pontifícia Universidade Católica de Campinas, Campinas, São Paulo, Brazil
- P251 Genetic Diversity and Antibiotic Resistance Profiling of *Salmonella* Isolated from Irrigation Water, Packing Shed Equipment, and Fresh Produce in Texas – E. A. DUFFY, S. D. Pillai, G. R. Acuff, A. Castillo, L. Cisneros-Zevallos, P. Van Laanen, and L. M. Lucia, Texas A & M University, College Station, TX, USA
- P252 Metabiosis of Proteolytic Molds and *Salmonella* in Raw, Ripe Tomatoes – Wendy N. Wade and LARRY R. BEUCHAT, University of Georgia, Griffin, GA, USA
- P253 Ionizing Radiation Sensitivity of *Listeria monocytogenes* and *L. innocua* inoculated on Endive (*Cichorium endiva*) – BRENDAN A. NIEMIRA, Xuotong Fan, Kimberley J. B. Sokorai, and Christopher H. Sommers, USDA-ARS-ERRC, Wyndmoor, PA, USA
- P254 DSC Inactivation of Ozone Alone or Combined with Organic Acids against *Escherichia coli* O157:H7 and *Listeria monocytogenes* Inoculated into Ready-to-Use Vegetables – M. Y. YOO, J. W. Yun, B. K. Park, and D. H. Oh, Kangwon National University, Chunchon, Kangwon, Korea
- P255 Cetylpyridinium Chloride and Ethanol Disinfection of Ready-to-Eat Vegetables Artificially Contaminated with *Campylobacter jejuni* and Stored at 5°C – TONY T. TRAN, Sharon Vanzego, Jason Gordon, and Alberta Nyarko, USDA, College Park, MD, USA
- P256 DSC Evaluating the Efficacy of a Commercial Produce Wash on Lettuce in a Foodservice Setting – SARAH SMITH, Mila Dunbar, Diana Tucker, and Don Schaffner, Rutgers University, New Brunswick, NJ, USA
- P257 Ingestion of *Salmonella* Poona by a Free-living Nematode, *Caenorhabditis elegans*, and Protection against Inactivation by Sanitizers – Krishnaun N. Caldwell, Barbara B. Adler, Gary L. Anderson, Phillip L. Williams, and LARRY R. BEUCHAT, University of Georgia, Griffin, GA, USA
- P258 Colonization of *Salmonella* Montevideo on Tomatoes as Affected by Relative Humidity and Storage Temperature – MONTERRAT H. ITURRIAGA and Eduardo F. Escartín, Universidad Autónoma de Querétaro, Querétaro, Mexico
- P259 Survival of an Acid-resistant *Escherichia coli* Small Colony Variant in Orange Juice and Apple Cider – IRVIN N. HIRSHFIELD, Meropi Aravantinou, Kelly Dong, Laura Krowtowsky, Panagiota Rizos, and Daniel Siegeman, St. John's University, Jamaica, NY, USA
- P260 Influence of Inoculation Method and Spot Inoculation Site on the Efficacy of Acidic Electrolyzed Water against *Salmonella* spp. on Lettuce – SHIGENOBU KOSEKI, Kyoihiro Yoshida, Yoshinori Kamitani, Kazuhiko Itoh, Hokkaido University, Sapporo, Hokkaido, Japan

- P261 Interaction of Foodborne Pathogens with Plant Tissue: An Active or Passive Process? – Ethan Solomon, Yassaman Shafaie, and KARL R. MATTHEWS, Rutgers University, New Brunswick, NJ, USA
- P262 Fate of Avirulent *Salmonella enterica* serovar Typhimurium on Selected Vegetables Grown in Fields Treated with Contaminated Manure Composts or Irrigation Water – MAHBUB ISLAM, Jennie Morgan, Michael P. Doyle, Sharad Phatak, Patricia Millner, and Xiuping Jiang, University of Georgia, Griffin, GA, USA
- P263 Fate of *Escherichia coli* O157:H7 in Manure Compost Applied to Soil to Grow Vegetables in a Growth Chamber – MAHBUB ISLAM, Jennie Morgan, Michael P. Doyle, and Xiuping Jiang, University of Georgia, Griffin, GA, USA
- P264 A Dynamic Model for Inactivation of *Listeria monocytogenes* during Fermentation of Green Table Olives – P. M. SKANDAMIS, N. Chorianopoulos, and G. J. E. Nychas, Agricultural University of Athens, Athens, WI, USA
- P265 Reduction of *Escherichia coli* O157:H7 in Cilantro by Chlorination and Gamma Irradiation – Megan Euper, Fredric Caporaso, Anuradha Prakash, and DENISE FOLEY, Chapman University, Orange, CA, USA
- P266 Development of Fluorescence Polarization Immunoassay for the Detection of Ochratoxin A in Korean Barley – HYEJUNG KIM, Yun-Jung Kim, Jin-Sun Kang, and Duck-Hwa Chung, Graduate School of Gyeongsang National University, Chinju, Gyeongnam, Korea
- P267 Chemical and Irradiation Treatments in Killing *Escherichia coli* O157:H7 on Alfalfa, Radish and Mung Bean Seeds – M. L. BARI, S. Kawasaki, E. Nazuka, S. Todoriki, and K. Isshiki, National Food Research Institute, Tsukuba-shi, Ibaraki, Japan
- P268 Growth of *Salmonella* during Sprouting of Naturally Contaminated Alfalfa Seeds as Affected by Sprouting Conditions – TONG-JEN FU, Olif M. VanPelt, and Karl F. Reinecke, FDA, NCFST, Summit-Argo, IL, USA
- P269 Growth and Survival of *Salmonella enterica* and Enterohemorrhagic *Escherichia coli* O157:H7 on the Model Plant *Arabidopsis thaliana* – MICHAEL B. COOLEY, William G. Miller, and Robert E. Mandrell, USDA-ARS-WRRC, Albany, CA, USA
- P270 Contamination of Prawn Flesh by *Listeria* spp. during Peeling of Cooked Prawns – GARY DYKES, Mark Vegar, and Paul Vanderlinde, Food Science Australia and University of Queensland, Tingalpa DC, Qld, Australia
- P271 Hydrated Lime Treatment of Raw Salmon Inactivates External Contamination by *Listeria innocua* – BRIAN HIMELBLOOM, Susan Vitt, and Chuck Crapo, University of Alaska-Fairbanks, Kodiak, AK, USA
- P272 Use of PFGE (Pulsed Field Gel Electrophoresis) to Trace the Dissemination of *Listeria monocytogenes* in a Gravlax Salmon Processing Line – C. D. Cruz, B. D. G. M. Franco, M. Landgraf, and M. T. DESTRO, Universidade de São Paulo, São Paulo, Brazil
- P273 Monitoring of Levels and Tracking of *Listeria monocytogenes* Strains in a Seafood Processing Environment Using Enrichment MPN and RAPD – C. CRONIN, M. Clarke, R. Witkowski, H. Lu, A. Sayedahmed, R. E. Levin, and L. A. McLandsborough, University of Massachusetts, Amherst, MA, USA
- P274 Tracking Viruses in the Food Chain – GAIL E. GREENING and Joanne Hewitt, Institute of Environmental Science & Research Ltd., Porirua, Wellington, New Zealand
- P275 Mitigation of Hepatitis A Virus in Shucked Oysters by Use of High Hydrostatic Pressure Treatment – KEVIN R. CALCI, David H. Kingsley, and Rukma N. Reddy, FDA, Dauphin Island, AL, USA
- P276 Prevalence of Enterovirus, NLV, and Microbial Indicators in Oysters Relocated to Gulf Coast Water Impacted by Municipal Sewage – JACQUELINA W. WOODS, Kevin R. Calci, and Y. Carol Shieh, FDA-CFSAN, Gulf Coast Seafood Laboratory, Dauphin Island, AL, USA
- P277 Survival and Persistence of Hepatitis A Virus and Norwalk-like Virus in Marinated Mussels – GAIL E. GREENING and Joanne Hewitt, Institute of Environmental Science and Research Ltd., Porirua, Wellington, New Zealand
- P278 A Comparison of *Vibrio* Species Associated with Regional Oyster Harvest Sites – CYNTHIA STOVER, Colleen Crowe, Paul Mead, and John Painter, CDC, Atlanta, GA, USA
- P279 Selectivity and Specificity of a Chromogenic Medium for Detecting *Vibrio parahaemolyticus* – JINGYUN DUAN and Yi-Cheng Su, Oregon State University, Astoria, OR, USA
- P280 Rapid Identification of *Vibrio vulnificus* by Real-time TaqMan PCR from Seawater – Hey-young Wang and JOON-SEOK CHAE, Chonbuk National University, Jeonju, Jeonbuk, South Korea

- P281 Use of an Acid Phosphatase Assay to Detect Deviations in Thermal Processing of Seafood – CATHERINE N. CUTTER and Barbara J. Miller, Pennsylvania State University, University Park, PA, USA
- P282 Application of a Fluorescent Probe to the Direct Detection and Enumeration of *Escherichia coli* in Shellfish – MANUELA OLIVERIA and Fernando Bernardo, CIISA/Laboratório de Inspeção Sanitária, Lisboa, Portugal
- P283 Histamine-related Hygienic Qualities and Bacteria Found in Popular Commercial Scombrotoxic Fish Fillets in Taiwan – YUNG-HSIANG TSAI, Ahsien-Feng Kung, Atsong-Ming Lee, Aguo-Tai Lin, and Deng-Fwu Hwang, Tajen Institute of Technology, Pingtung, Taiwan, R.O.C.
- P284 Monitoring of Total Volatile Basic Nitrogen, Trimethylamine Nitrogen and Biogenic Amines in Salted and Dried Chub Mackerel – M. J. PERIAGO, J. Rodrigo, G. Ros, M. C. Martínez, and G. López, Murcia University, Espinardo, Murcia, Spain
- P285 Withdrawn
- P286 Baseline Risk Study of Chemical Contaminants in Ontario Farm-raised Rainbow Trout – GAVIN DOWNING, Ana Matu, Martha Fabri, and Mike Cassidy, Ontario Ministry of Agriculture and Food, Guelph, ON, Canada
- P287 Effects of E-Beam Irradiation on the Presence and Health Significance of *Cryptosporidium parvum* in Eastern Oysters (*Crassostrea virginica*) – MARINA V. COLLINS, George J. Flick, David S. Lindsay, Stephen A. Smith, and Ronald Fayer, Virginia Tech, Blacksburg, VA, USA
- P288 Effect of Peroxyacetic Acid and Its Mixture to Eliminate Significant Foodborne Pathogens in Shrimp Processing – WARAPA MAHAKARNCHANAKUL, Sasikarn Ungniphakul, and Preeya Vibulsresth, Kasetsart University, Jatukjak, Bangkok, Thailand

WANTED:

The editors are seeking articles of general interest and applied research with an emphasis on food safety for publication in *Food Protection Trends*.

Submit your articles to:

Donna Bahun, Production Editor

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International Association for Food Protection

6200 Aurora Ave., Suite 200W

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Please submit three copies of manuscripts on a disk saved in an rtf format.



Event Information

EVENING TOURS



MONDAY NIGHT SOCIAL AT MARDI GRAS WORLD – Sponsored by IGEN International, Inc.
Monday, August 11, 2003 • 6:30 p.m. – 10:00 p.m.

Fred Flinstone awaits. So do Rhett Butler, Wonder Woman, King Kong, Hulk Hogan and Marilyn Monroe. They're standing around a wondrous warehouse filled with Mardi Gras floats, giant disembodied heads and larger-than-life creatures such as Medusa and Poseidon.

Coming upon them at Blaine Kern's Mardi Gras World is like walking into a giant toy box of doll parts. What visitors are actually seeing are bits and pieces of Mardi Gras floats (and some complete ones), movie-set pieces and sculpted characters made for Walt Disney World attractions and other festive occasions.

Blaine Kern, known in New Orleans as "Mr. Mardi Gras," started the company Blaine Kern Artists in 1947 and opened Mardi Gras World to the public in 1984. Now, 150,000 people tour the studio every year.

Even those who never plan to go to the real Mardi Gras would probably like visiting Mardi Gras World. After all, how often do you get to see Spiderman, Marilyn, Scarlett and Rhett all in the same room? The night will be filled with food, entertainment, and fun! This is a Monday Night Social you will not want to miss.

CREOLE QUEEN DINNER & JAZZ CRUISE

Tuesday, August 12, 2003

7:00 p.m. – 8:00 p.m. Boarding

8:00 p.m. – 10:00 p.m. Cruising with Dinner



Constructed at Moss Point, Mississippi, the Paddle-wheeler Creole Queen took her maiden voyage on October 1, 1983. She is an authentic paddle-wheeler powered by a 24-foot diameter paddlewheel. You will experience the finest in Southern hospitality as you board the Creole Queen for a leisurely and fun trip down the Mississippi. The sounds of Dixieland fill the air as you step aboard for an adventure back in time. Relive the era when cotton was king while enjoying a lavish Creole buffet. A cruise on the Mississippi is pure New Orleans and pure pleasure! Your ticket purchase benefits the IAFP Foundation Fund.

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IAFP FUNCTIONS

NEW MEMBER RECEPTION

Saturday, August 9, 2003 • 4:30 p.m. – 5:30 p.m.

If you recently joined the Association or if this is your first time attending an IAFP Annual Meeting, welcome! Attend this informal reception to learn how to get the most out of attending the Meeting and meet some of today's leaders.

AFFILIATE RECEPTION

Saturday, August 9, 2003 • 5:30 p.m. – 7:00 p.m.

Affiliate officers and delegates plan to arrive in time to participate in this educational reception. Dianne Sclafani will present "Planning and Executing Board and Committee Meetings" for attendees.

COMMITTEE MEETINGS

Sunday, August 10, 2003 • 7:00 a.m. – 5:00 p.m.

Committees and Professional Development Groups (PDGs) plan, develop and institute many of the Association's projects, including workshops, publications, and educational sessions. Share your expertise by volunteering to serve on any number of committees or PDGs.

STUDENT LUNCHEON

Sunday, August 10, 2003 • 12:00 p.m. – 1:30 p.m.

The mission of the Student PDG is to provide students of food safety with a platform to enrich their experience as Members of IAFP. Sign up for the luncheon to help start building your professional network.

OPENING SESSION

Sunday, August 10, 2003 • 7:00 p.m. – 8:00 p.m.

Join us to kick off IAFP 2003 at the Opening Session. Listen to the prestigious Ivan Parkin Lecture delivered by Donald L. Zink, Ph.D., Lead Scientist, Food Processing, FDA, CFSAN, OPDFB, College Park, Maryland. The presentation will be "On the Trail of Food Safety — From the Early Days to the Future."

CHEESE AND WINE RECEPTION

Sunday, August 10, 2003 • 8:00 p.m. – 10:00 p.m.

An IAFP tradition for attendees and guests. The reception begins immediately following the Ivan Parkin Lecture on Sunday evening in the Exhibit Hall.

IAFP JOB FAIR

Sunday, August 10 through Wednesday, August 13, 2003

Employers, take advantage of recruiting the top food scientists in the world! Post your job announcements and interview candidates. Watch for additional information at www.foodprotection.org.

DAYTIME TOURS

NEW ORLEANS SUPER CITY TOUR

Sunday, August 10, 2003 • 9:00 a.m. – 2:00 p.m.



See the landmarks and architecture and listen to the legends and charm that make New Orleans famous! Three hundred years of entertaining history about "America's Most Interesting City" make this tour a visitor's favorite. The tour will begin with Jackson Square, continue along Esplanade Avenue with its splendid architecture, and then on to the "Cities of the Dead" where you'll learn about a most unusual burial system. City Park, Lake Pontchartrain, the New Orleans Yacht Club, the oldest in the US and the Causeway, the longest bridge in the world are next on the agenda. Traveling along the line of the famous St. Charles Avenue Streetcar, the tour will pass Tulane and Loyola Universities and Audubon Park. Better known as "Millionaire's Row", St. Charles Avenue boasts stately mansions and lush tropical gardens. While uptown, enjoy a traditional New Orleans jazz brunch at Dominique's. The tour will brush the edges of the warehouse and business districts enroute back to the Hilton New Orleans Riverside. When this tour draws to an end, guests will have a much deeper understanding of New Orleans and its fascinating history.

SWAMP & BAYOU TOUR

Monday, August 11, 2003 • 9:00 a.m. – 1:00 p.m.



Along with the wondrous alligator, visit a few other Louisiana swamp friends. How about a beautiful ivory white egret (related to the crane) perched on a moss-draped cypress tree searching for an ill-fated catfish? Or a curious raccoon along the bayou's edge gathering his lunch of crawfish while a Louisiana snapping turtle watches him from atop a fallen willow tree? Or a Cajun hunter's cabin with an alligator sunbathing on his weather-beaten wharf? All this and much more will accompany your adventure into the pristine bayous and swamps of Southern Louisiana. Your guide will entertain you with Cajun folklore and Cajun Zydeco music as he skillfully guides your climate-controlled swamp boat

beneath the beautiful foliage draped mysteriously across your path. He will bring you into hidden coves which you probably only thought existed on the Discovery Channel. Enjoy lunch in the Gator Den Cafe before leaving Cajun country.

RIVER ROAD PLANTATION TOUR

Tuesday, August 12, 2003 • 9:00 a.m. – 4:00 p.m.



Sit back, relax and enjoy a delightful journey along the River Road, back in time to an era when sugar was king and a massive plantation was a sugar planter's kingdom! A native tour guide will point out sites and tell tales of the bygone antebellum period on the excursion to two magnificent plantations, Oak Alley and San Francisco. Oak Alley is named for the dramatic double row of live oaks interlaced to form a beautiful canopy leading three hundred yards from River Road to the mansion. It is considered to be one of the finest remaining examples of adaptive restoration. Nowhere else in the Mississippi Valley is there such a spectacular setting! Enjoy a luncheon buffet on the grounds before continuing along River Road to bright and colorful San Francisco Plantation. Originally named for its builder, Marmillion, it was renamed as a derivation of the French Slang "sans fruscins" — "without a penny in my pocket," in reference to its high cost to build. Gingerbread galleries and extensive ornamentation mark the exterior while San Francisco's interior is ornate, boasting handcarved woodwork, ceiling paintings, frescos and beveled glass. A tour you will be sure to remember.

NEW ORLEANS SCHOOL OF COOKING

Wednesday, August 13, 2003 • 9:30 a.m. – 1:00 p.m.



Join in the fun in the comfortable atmosphere of a Louisiana homestyle kitchen to learn the secrets of authentic Creole cooking. The City That Care Forgot never forgets about its food, and you will never forget it either. In just three hours, you'll learn to recreate the magic of New Orleans in your own kitchen. Founded in 1980, the cooks at The New Orleans School of Cooking demonstrate basic Creole recipes and share their favorite tips while the rich, spicy aromas float through the air.

HOSPITALITY ROOM

SPOUSE/COMPANION ROOM

Register your spouse/companion and they will have access to the hospitality room where a continental breakfast and afternoon snacks are provided Sunday through Wednesday.



IMPORTANT! Please read this information before completing your registration form.

MEETING INFORMATION

Register to attend the world's leading food safety conference.

Registration includes:

- ◆ Technical Sessions
- ◆ Symposia
- ◆ Poster Presentations
- ◆ Ivan Parkin Lecture
- ◆ Exhibit Hall Admittance
- ◆ Cheese and Wine Reception
- ◆ Exhibit Hall Reception
- ◆ Program and Abstract Book

4 EASY WAYS TO REGISTER

Complete the Attendee Registration Form and submit it to the International Association for Food Protection by:



Online: www.foodprotection.org



Fax: 515.276.8655



Mail: 6200 Aurora Avenue, Suite 200W,
Des Moines, IA 50322-2864, USA



Phone: 800.369.6337; 515.276.3344

The early registration deadline is July 9, 2003.
After this date, late registration fees are in effect.



REFUND/CANCELLATION POLICY

Registration fees, less a \$50 administration fee and any applicable bank charges, will be refunded for written cancellations received by July 25, 2003. No refunds will be made after July 25, 2003; however, the registration may be transferred to a colleague with written notification. Refunds will be processed after August 18, 2003. Event and tour tickets purchased are nonrefundable.

EXHIBIT HOURS

Sunday, August 10, 2003	8:00 p.m. – 10:00 p.m.
Monday, August 11, 2003	9:30 a.m. – 1:30 p.m. 3:00 p.m. – 6:30 p.m.
Tuesday, August 12, 2003	9:30 a.m. – 1:30 p.m.

DAYTIME TOURS

(Lunch included in all daytime tours)

Sunday, August 10, 2003	
New Orleans Super City Tour	9:00 a.m. – 2:00 p.m.
Monday, August 11, 2003	
A Swamp Tour Experience	9:00 a.m. – 1:00 p.m.
Tuesday, August 12, 2003	
River Road Plantation Tour	9:00 a.m. – 4:00 p.m.
Wednesday, August 13, 2003	
New Orleans School of Cooking	9:30 a.m. – 1:00 p.m.

EVENING EVENTS

Sunday, August 10, 2003	
Opening Session	7:00 p.m. – 8:00 p.m.
Cheese and Wine Reception	8:00 p.m. – 10:00 p.m.
<i>Sponsored by Kraft Foods North America</i>	
Monday, August 11, 2003	
Exhibit Hall Reception	5:00 p.m. – 6:30 p.m.
<i>Sponsored by Qualicon Inc.</i>	
Monday Night Social at Mardi Gras World	6:30 p.m. – 10:00 p.m.
<i>Sponsored by IGEN International, Inc.</i>	
Tuesday, August 12, 2003	
Creole Queen Dinner and Jazz Tour	7:00 p.m. – 10:00 p.m.
<i>Ticket sales will benefit the IAFP Foundation Fund</i>	
Wednesday, August 13, 2003	
Awards Banquet Reception	6:00 p.m. – 7:00 p.m.
Awards Banquet	7:00 p.m. – 9:30 p.m.

HOTEL INFORMATION

For reservations, contact the hotel directly and identify yourself as an International Association for Food Protection Annual Meeting attendee to receive a special rate of \$145/\$165 per night, single/double. Make your reservations as soon as possible; this special rate is available only until July 9, 2003.

Hilton New Orleans Riverside
Two Poydras St.
New Orleans, Louisiana 70140
800.HILTONS
504.561.0500



International Association for Food Protection®

6200 Aurora Avenue, Suite 200W
Des Moines, IA 50322-2864, USA
Phone: 800.369.6337 • 515.276.3344
Fax: 515.276.8655
E-mail: info@foodprotection.org
Web site: www.foodprotection.org



Attendee Registration Form

Name (Print or type your name as you wish it to appear on name badge) _____ Member Number: _____

Employer _____ Title _____

Mailing Address (Please specify: ☐ Home ☐ Work) _____

City _____ State/Province _____ Country _____ Postal/Zip Code _____

Telephone _____ Fax _____ E-mail _____

☐ Regarding the ADA, please attach a brief description of special requirements you may have. Member since: _____

☐ IAFP occasionally provides Attendees' addresses (excluding phone and E-mail) to vendors and exhibitors supplying products and services for the food safety industry.
If you prefer NOT to be included in these lists, please check the box.

PAYMENT MUST BE RECEIVED BY JULY 9, 2003 TO AVOID LATE REGISTRATION FEES

REGISTRATION FEES:	MEMBERS	NONMEMBERS	TOTAL
Registration (Awards Banquet included)	\$ 305 (\$355 late)	\$ 475 (\$525 late)	_____
Association Student Member (Awards Banquet included)	\$ 52 (\$ 62 late)	Not Available	_____
Retired Association Member (Awards Banquet included)	\$ 52 (\$ 62 late)	Not Available	_____
One Day Registration: * <input type="checkbox"/> Mon. <input type="checkbox"/> Tues. <input type="checkbox"/> Wed.	\$ 170 (\$195 late)	\$ 235 (\$260 late)	_____
Spouse/Companion* (Name): _____	\$ 50 (\$ 50 late)	\$ 50 (\$ 50 late)	_____
Children 15 & Over* (Names): _____	\$ 25 (\$ 25 late)	\$ 25 (\$ 25 late)	_____
Children 14 & Under* (Names): _____	FREE	FREE	_____
*Awards Banquet not included			
EVENTS:		# OF TICKETS	
Student Luncheon (Sunday, 8/10)	\$ 5 (\$ 10 late)	_____	_____
Monday Night Social at Mardi Gras World (Monday, 8/11)	\$ 39 (\$ 44 late)	_____	_____
Children 14 and under	\$ 34 (\$ 39 late)	_____	_____
Creole Queen Dinner and Jazz Tour (Tuesday, 8/12)	\$ 70 (\$ 75 late)	_____	_____
Awards Banquet (Wednesday, 8/13)	\$ 50 (\$ 55 late)	_____	_____
DAYTIME TOURS:			
(Lunch included in all daytime tours)			
New Orleans Super City Tour (Sunday, 8/10)	\$ 69 (\$ 74 late)	_____	_____
A Swamp Tour Experience (Monday, 8/11)	\$ 68 (\$ 73 late)	_____	_____
River Road Plantation Tour (Tuesday, 8/12)	\$ 70 (\$ 75 late)	_____	_____
New Orleans School of Cooking (Wednesday, 8/13)	\$ 48 (\$ 53 late)	_____	_____

PAYMENT OPTIONS:

☐ Check Enclosed ☐ ☐ ☐

TOTAL AMOUNT ENCLOSED \$ _____
US FUNDS on US BANK

Account Number _____

Expiration Date _____

Name on Card _____

JOIN TODAY AND SAVE!!!
(Attach a completed Membership application)

Signature _____

EXHIBITORS DO NOT USE THIS FORM



Workshops

Sponsored by



International Association for
Food Protection®

Workshop 1

Assuring Confidence in Laboratory Data

This workshop will present principals for understanding and implementing microbial control in a food production environment by providing skills to address limitations in your current laboratory testing and documentation. You will learn, in an interactive environment, how to perform effectively sound food and environmental sampling and microbial testing that can be implemented into your standard operating procedures and will conform to today's QA and ISO requirements. Workshop participants will review and discuss material from practical case studies and present their findings to the group in an informal presentation that will facilitate open discussion. Workshop includes a binder of tools and references to reinforce the practical experience gained from the workshop.

Workshop Topics

- Outsourcing/Auditing: What should you expect from an outside food-testing laboratory relative to quality systems and capabilities
- Laboratory quality assurance and preparing your laboratory to address ISO 17025
- Microbial control: where and how raw ingredient and finished product testing fit into the big picture
- Microbial control: where and how environmental/investigational sampling fit into the big picture
- Practical approaches to incorporating rapid methods into the laboratory
- IQ, OQ, PQ: what food companies can learn from pharmaceutical validation principals
- Using data management and trend analysis techniques to drive continuous improvement

Instructors

Robert Behling, Independent Consultant, Madison, WI

Jay Ellingson, Marshfield Laboratories, Marshfield, WI

Robert Ferer, Vectech Pharmaceutical Consultants, Inc. Farmington Hills, MI

W. Payton Pruett, Jr., Ph.D., ConAgra Refrigerated Prepared Foods, Downers Grove, IL

Cindy Ryan, Nestlé USA, Dublin, OH

Michael Sole, Canadian Food Inspection Agency, Ottawa, Ontario, Canada

Organizers and Instructors

Patricia Rule, bioMérieux, Inc., Hazelwood, MO

Jeff Kornacki, Ph.D., University of Georgia, Griffin, GA

Who Should Attend?

Laboratory managers, supervisors, scientists and technicians responsible for product sampling, as well as performing and documenting microbial tests in a food production environment.

Hours for Workshop

Friday August 8, 2003	Saturday August 9, 2003
Registration – 7:30 a.m. Continental Breakfast	7:30 a.m. Continental Breakfast
Workshop – 8:00 a.m. – 5:00 p.m. (Lunch Provided)	Workshop – 8:00 a.m. – 4:00 p.m. (Lunch Provided)

Workshop II

A Hands-on Course in Quantitative Microbial Risk Assessment

This workshop will cover fitting data to statistical distributions, creating and using predictive models in risk assessment, developing a process risk model, using sensitivity analysis, and testing proposed mitigations to reduce risk. Over the course of the workshop, the participants will build an actual working quantitative microbial risk assessment in Excel (Microsoft Corporation) using BestFit and @Risk software (Palisades Corporation).

Participants will build, run, interpret, and determine the impact of various changes to the model. Two-way risk model will be run to show the value of separating variability and uncertainty in quantitative risk assessment. Students will learn to determine whether additional data, better process control or a redesigned process will produce the greatest reduction in risk.

You are encouraged to bring actual data and real world problems to the workshop, but a fictitious example will also be developed during the workshop. Each participant is also strongly encouraged to bring his or her own laptop (with CD drive) and have a working copy of Excel (Microsoft Corp.). Thirty-day demonstration copies of BestFit and @Risk software (Palisades Corporation) will be provided.

Workshop Topics

- Overview of QRA
- Fitting data to distributions
- Use of predictive modeling in QRA
- Building a process risk model in Excel

- Conducting a sensitivity analysis
- Separating variability and uncertainty in QRA
- Hands on exercise:
 - Distributions
 - Modeling
 - Process Risk Model
 - Sensitivity Analysis
 - Variability and Uncertainty

Organizers and Instructors

Don Schaffner, Ph.D., Rutgers University,
New Brunswick, NJ

Richard Whiting, Ph.D., Food and Drug Administration, Center for Food Safety and Applied Nutrition, College Park, MD

Who Should Attend?

This workshop will serve as an "advanced introduction" intended for anyone interested in gaining direct hands-on experience with tools and techniques used in quantitative microbial risk assessment.

Hours for Workshop

Friday
August 8, 2003

Saturday
August 9, 2003

Registration –

12:30 p.m.

7:30 a.m. Continental
Breakfast

Workshop –

1:00 p.m. – 5:00 p.m.

Workshop –

8:00 a.m. – 5:00 p.m.
(Lunch Provided)

Workshop I Assuring Confidence in Laboratory Data

	Early Rate	Late Rate
IAFP Member	\$525.00	\$600.00
Non-Member	\$625.00	\$700.00

Workshop II A Hands-on Course in Quantitative Microbial Risk Assessment

	Early Rate	Late Rate
IAFP Member	\$315.00	\$390.00
Non-Member	\$415.00	\$490.00

Continued on next page



Workshop Registration Form

Friday-Saturday, August 8-9, 2003

Workshop I: Assuring Confidence in Laboratory Data

Workshop II: A Hands-on Course in Quantitative Microbial Risk Assessment

First Name (will appear on badge)

Last Name

Company

Job Title

Address

City

State/Province

Country

Postal Code/Zip + #

Area Code & Telephone

Fax

E-mail

Member #

☐ Check Enclosed



Total Amount Enclosed
(US Funds on US Bank) \$

Credit Card #

Signature

Expiration date

Register by July 18, 2003 to avoid late registration fees

Registration

WORKSHOP I: Assuring Confidence in Laboratory Data

	Early Rate	Late Rate
IAFP Member	\$525.00	\$600.00
NonMember	\$625.00	\$700.00

WORKSHOP II: A Hands-on Course in Quantitative Microbial Risk Assessment

	Early Rate	Late Rate
IAFP Member	\$315.00	\$390.00
NonMember	\$415.00	\$490.00

GROUP DISCOUNT:

Register 3 or more people from your company and receive a 15% discount. Registrations must be received as a group.

Refund/Cancellation Policy

Registration fees, less a \$50 administrative charge, will be refunded for written cancellations received by July 25, 2003. No refunds will be made after that date; however, the registration may be transferred to a colleague with written notification. Refunds will be processed after August 18, 2003. The workshop may be cancelled if sufficient enrollment is not received by July 18, 2003.

For further information, please contact the Association office at 800.369.6337; 515.276.3344; Fax: 515.276.8655; E-mail: jcattanach@foodprotection.org.

4 Easy Ways to Register

To register, complete the Workshop Registration Form and submit it to the International Association for Food Protection by:



Online: www.foodprotection.org



Phone: 800.369.6337; 515.276.3344



Fax: 515.276.8655



Mail: 6200 Aurora Avenue, Suite 200W, Des Moines, IA 50322-2864

THE Black Pearl AWARD

RECOGNITION FOR CORPORATE EXCELLENCE IN FOOD SAFETY AND QUALITY



The Black Pearl Award is given annually to a company for its 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 the International Association for Food Protection. We invite you to nominate your company for this prestigious recognition. Contact the Association office for nomination information.

Presented by

**The International Association
for Food Protection**

Proudly sponsored by

**Willbur S. Feagan and
F&H Food Equipment Company**

Black Pearl Recipients

2003 Wegmans Food Markets Inc.
Rochester, New York

2002 Darden Restaurants
Orlando, Florida

2001 Walt Disney World Company
Lake Buena Vista, Florida

**2000 Zep Manufacturing
Company**
Atlanta, Georgia

1999 Caravelle Foods
Brampton, Ontario, Canada

1998 Kraft Foods, Inc.
Northfield, Illinois

**1997 Papetti's of Iowa
Food Products, Inc.**
Lenox, Iowa

1996 Silliker, Inc.
Homewood, Illinois

1995 Albertson's, Inc.
Boise, Idaho

1994 HEB Company
San Antonio, Texas

Contribute to the Sixth Annual Foundation Fund Silent Auction Today!



The Foundation of the International Association for Food Protection will hold its Annual Silent Auction during IAFP 2003, the Association's 90th Annual Meeting in New Orleans, Louisiana, August 10-13, 2003. The Foundation Fund supports the:

- * Ivan Parkin Lecture
- * Travel support for exceptional speakers at the Annual Meeting
- * Audiovisual Library
- * Developing Scientist Competition
- * Shipment of volumes of surplus *JFP* and *FPT* journals to developing countries through FAO in Rome

Support the Foundation by donating an item today. A sample of items donated last year included:

- * Black Tahitian Pearl Necklace
- * Food Safety Information Handbook
- * Hand Crocheted Table Coverings
- * Stadium Blanket with IAFP Logo
- * Zoo Wall Hanging
- * Oscar Mayer Remote Controlled Wiener Mobile
- * 2001 United States Congressional Ornament
- * Wine
- * Cougar Gold Cheese
- * Missouri Ham

Complete the form and send it in today.



Description of Auction Items _____

Estimated Value _____

Name of Donor _____

Company (if relevant) _____

Mailing Address _____

(Please specify: ☐ Home ☐ Work)

City _____ State or Province _____

Postal Code/Zip + 4 _____ Country _____

Telephone # _____ Fax # _____

E-mail _____

Return to:

Donna Gronstal
International Association for Food Protection
6200 Aurora Avenue, Suite 200W
Des Moines, IA 50322-2864, USA
800.369.6337; 515.276.3344
Fax: 515.276.8655
E-mail: dgronstal@foodprotection.org



International Association for
Food Protection®

Promotional Opportunities

Advertising and sponsorship opportunities are available to enhance the promotion of your organization.

Sponsorships

We invite you to participate as a sponsor for IAFP 2003. Sponsorship participation provides an excellent opportunity to position your company or organization as a supporter of the Association.

Please review the event listing to select the one that will best position your organization. Reservations will be taken in order received for any open sponsorship events. A waiting list for events with a right of first option will be established.

Sponsorship Event List

<u>Amount</u>	<u>Event</u>
\$16,000	Monday Evening Social
\$15,000	Opening Reception (Sunday)
\$14,000	Exhibit Hall Reception (Monday)
\$10,000	President's Reception (Tuesday)
\$7,500	Badge Holders w/Lanyards
\$5,000	Exhibit Hall Pastries and Coffee (Monday Morning)
\$3,000	Exhibit Hall Coffee Break (Monday Afternoon)
\$5,000	Exhibit Hall Pastries and Coffee (Tuesday Morning)
\$3,000	Coffee Break (Tuesday Afternoon)
\$3,000	Coffee Break (Wednesday Morning)
\$2,500	Coffee Break (Wednesday Afternoon)
\$3,500	Notepads with Sponsor's Logo
\$3,500	Spouse/Companion Hospitality Room
\$3,500	Student PDG Luncheon (Sunday)
\$2,500	IAFP New Member Orientation (Saturday)
\$3,000	Affiliate Reception (Saturday)
\$2,000	Awards Banquet Flowers (Wednesday)
\$1,750	Committee Day Refreshments (Sunday)
\$1,500	Exhibitor Move-in Refreshments (Sunday)
\$1,000	Speaker Travel Support

Partial sponsorship for the above events is available.

Contact David Larson for details.

Phone: 515.440.2810

Fax: 515.440.2809

E-mail: larson6@earthlink.net

Sponsorship Participant

Name _____

Company _____

Address _____

City _____ State or Province _____

Country _____ Postal Code/Zip + 4 _____

Phone _____ Fax _____

E-mail _____

Desired Event to Sponsor _____

Amount Paid \$ _____

U.S. Funds on U.S. Bank

Return form to:

IAFP
6200 Aurora Ave., Suite 200W
Des Moines, IA 50322-2864
Phone: 515.276.3344
Fax: 515.276.8655
E-mail: info@foodprotection.org

Payment: ☐ Check ☐ Mastercard
☐ VISA ☐ American Express

Account Number _____

Expiration Date _____

Cardholder Signature _____



Exhibitors

Companies scheduled to exhibit as of June 6, 2003



3M Microbiology
Phone: 800.228.3957

Fax: 651.737.1994



ABC Research Corporation
Phone: 352.372.0436

Fax: 352.378.6483

AES - Chemunex, Inc.
Phone: 609.497.0166

Fax: 609.497.7307

AIHA Food Laboratory Accreditation Program
Phone: 703.846.0762

Fax: 703.207.3561

aLF Ventures, LLC
Phone: 816.961.1030

Fax: 816.961.1031

American Proficiency Institute
Phone: 800.333.0958

Fax: 231.941.7287

Association of Food and Drug Officials
Phone: 717.757.2888

Fax: 717.755.8089



BD Diagnostic Systems
Phone: 410.316.4024

Fax: 410.316.4906



BioControl Systems, Inc.
Phone: 800.245.0113

Fax: 425.603.0080



Biolog, Inc.
Phone: 510.785.2564

Fax: 510.782.4639



bioMérieux, Inc.
Phone: 800.634.7656

Fax: 800.657.3053



Bio-Rad Laboratories
Phone: 800.4BIORAD

Fax: 510.741.5800

Bioscience International, Inc.
Phone: 301.230.0072

Fax: 301.230.1418

BioSys, Inc.
Phone: 866-3Biosys

Fax: 734.477.9261

Carmina Technologies, Inc.
Phone: 416.410.6114

Fax: 416.214.6419

Charm Sciences
Phone: 800.343.2170

Fax: 978.687.9216

Copan Diagnostics, Inc.
Phone: 800.216.4016

Fax: 909.549.8850

CRC Industries, Inc.
Phone: 800.556.5074

Fax: 215.442.6244

CRC Press
Phone: 800.272.7737

Fax: 561.997.7249



Decagon Devices, Inc.
Phone: 800.755.2751

Fax: 509.332.5158



Deibel Laboratories
Phone: 847.329.9900

Fax: 847.329.9903

Diffchamb, Inc.
Phone: 866.DIFFCHAMB

Fax: 312.346.0683



DonLevy Laboratories
Phone: 219.736.0472

Fax: 219.736.0539



DQCI Services, Inc.
Phone: 763.785.0484

Fax: 763.785.0584



DSM Food Specialties USA, Inc.
Phone: 800.423.7906

Fax: 262.255.7732



DuPont Qualicon
Phone: 800.863.6842

Fax: 302.695.5301



Dynal Biotech, Inc.
Phone: 866.DYNALTT

Fax: 610.940.3606



EMD Chemicals Inc.
Phone: 800.222.0342

Fax: 856.423.6313

EnvoyWorldWide, Inc.
Phone: 888.252.7837

Fax: 781.482.2199



FoodHandler, Inc.
Phone: 516.338.4433

Fax: 516.338.5486



Food Processors Institute
Phone: 800.355.0983

Fax: 202.639.5932

Food Quality Magazine
Phone: 215.860.7800

Fax: 215.860.7900

FOODSAFE Systems, Inc.
Phone: 800.809.8586

Fax: 650.589.5783

Food Safety Institute
Phone: 225.769.6627

Fax: 504.393.5270

Food Safety Magazine
Phone: 818.842.4777

Fax: 818.769.2939



Food Safety Net Services, Ltd.
Phone: 888.525.9788

Fax: 210.308.8730

Food Safety Summit
Phone: 800.746.9646

Fax: 973.514.5977

Hanna Instruments
Phone: 401.765.7500

Fax: 401.765.7575

Hardy Diagnostics
Phone: 800.266.2222

Fax: 805.614.9274

Hygiena LLC
Phone: 805.388.8007

Fax: 805.388.5531

IGEN International, Inc.
Phone: 800.336.4436

Fax: 240.632.2206

International Association for Food Protection
Phone: 800.369.6337

Fax: 515.276.8655

International Association for Food Protection - Student PDG
Phone: 800.369.6337

Fax: 515.276.8655



International BioProducts
Phone: 800.729.7611

Fax: 425.398.7973

International Food Hygiene
Phone: 44.13.7724.1724

Fax: 44.13.7725.3640

International Food Information Council Foundation
Phone: 202.296.6540

Fax: 202.296.6547

International Life Sciences Institute (ILSI)
Phone: 202.659.0074

Fax: 202.659.8654

Interscience Laboratories, Inc.

Phone: 781.682.9033

Fax: 781.682.9035

IQ Scientific Instruments, Inc.

Phone: 800.276.0723

Fax: 858.673.1853

**Joint Institute for Food Safety and Applied Nutrition
(JIFSAN)**

Phone: 301.405.1696

Fax: 301.405.8390

Kluwer Academic Publishers

Phone: 866.269.9527

Fax: 781.871.6528

**MATRIX MicroScience, Ltd.**

Phone: 303.277.9613

Fax: 303.277.9643

Medallion Laboratories

Phone: 800.245.5615

Fax: 763.764.4010

MicroBioLogics, Inc.

Phone: 800.599.2487

Fax: 320.253.6250

Microbiology International

Phone: 800.396.4276

Fax: 301.662.8096

**Nasco**

Phone: 800.558.9595

Fax: 920.563.8296

National Center for Food Safety and Technology

Phone: 708.563.1576

Fax: 708.563.1873

**The National Food Laboratory, Inc.**

Phone: 925.828.1440

Fax: 925.833.9239

National Food Safety and Toxicology Center

Phone: 517.432.3100

Fax: 517.432.2310

National Restaurant Association Educational Foundation

Phone: 312.715.5384

Fax: 800.247.8978

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Sunday, August 10, 20038:00 p.m. – 10:00 p.m.
Cheese and Wine Reception**Monday, August 11, 2003**9:30 a.m. – 11:00 a.m.
Pastries and Coffee
3:00 p.m. – 4:30 p.m.
Coffee Break
5:00 p.m. – 6:30 p.m.
Exhibit Hall Reception**Tuesday, August 12, 2003**9:30 a.m. – 11:00 a.m.
Pastries and Coffee**EXHIBIT HOURS****Sunday, August 10, 2003**

8:00 p.m. – 10:00 p.m.

Monday, August 11, 20039:30 a.m. – 1:30 p.m.
3:00 p.m. – 6:30 p.m.**Tuesday, August 12, 2003**

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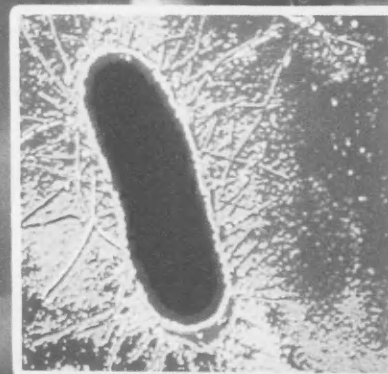
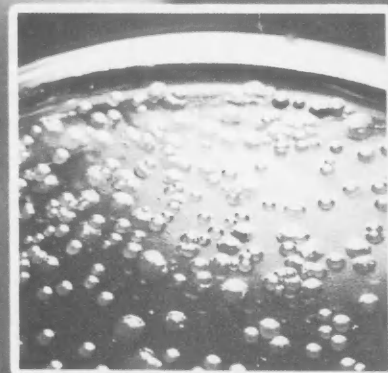
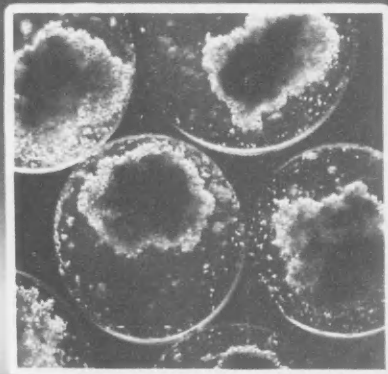
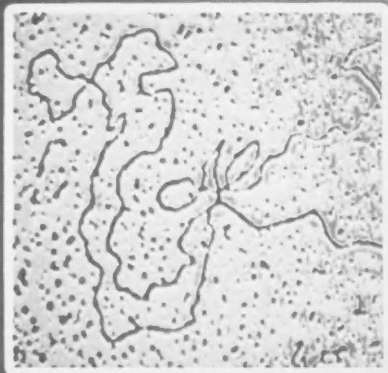
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COMING EVENTS

AUGUST

- **8-9, IAFP 2003 Workshops**, Hilton New Orleans Riverside, New Orleans, LA.
Workshop I – Assuring Confidence in Laboratory Data.
Workshop II – A Hands-on Course in Quantitative Microbial Risk Assessment.
See page 616 of this issue for additional workshop information.
- **10-13, IAFP 2003, the Association's 90th Annual Meeting**, Hilton New Orleans Riverside. For more information, contact Julie Cattanaach at 515.276.3344; E-mail: jcattanaach@foodprotection.org.
- **24-27, International Dairy Federation 2nd World Symposium of Dairy Products in Human Health and Nutrition**, Melbourne, Australia. For more information, contact Pamela Tyers at 61.3.9731.3484; E-mail: Pamela.tyers@foodscience.afisc.csiro.au.
- **26, Microbiology II: Sanitation**, Guelph Food Technology Centre, Guelph, Ontario, Canada. For more information, contact Marlene Inglis at 519.821.1246; E-mail: minglis@gftc.ca.

SEPTEMBER

- **4, HACCP: A Management Summary**, GFTC, Guelph, Ontario, Canada. For more information, call 519.821.1246; E-mail: gftc@gftc.ca.
- **7-12, International Meeting on Radiation Processing (IMRP) 2003**, Chicago, IL. For more information, contact Patty Brewer at 814.870.8483.
- **10-14, International Food, Drink and Technology Exhibition**, National Expocenter of Ukraine, Kiev. For more information, contact Ken Cardelle at 203.357.1400; E-mail: Kcardelle@iegexpo.com.
- **15-16, HACCP I: Documenting Your HACCP Prerequisites**, GFTC, Guelph, Ontario, Canada. For more information, call 519.821.1246; E-mail: gftc@gftc.ca.
- **16-17, Upper Midwest Dairy Industry Association Annual**

Meeting, Holiday Inn, St. Cloud, MN.

For more information, contact Paul Nierman at 763.785.0484.

- **16-18, New York State Association for Food Protection Annual Meeting**, Sheraton Inn, Saratoga Springs, NY. For more information, call Janene Lucia at 607.255.2892.
- **17-18, Wisconsin Association for Food Protection Joint Education Conference**, Holiday Inn, Fond du Lac, WI. For more information, contact Randy Daggs at 608.837.2087.
- **17-19, HACCP II: Developing Your HACCP Plan**, GFTC, Guelph, Ontario, Canada. For more information, call 519.821.1246; E-mail: gftc@gftc.ca.
- **21-24, The Western Association of Food and Drug Officials 2003 Educational Conference**, Silver Legacy Resort, Reno, NV. For more information, call 800.687.8733.
- **22-24, Indiana Environmental Health Association Annual Fall Meeting**, Holidome, Jasper, IN. For more information, contact Helene Uhlman at 219.853.6358.
- **22-24, Kansas Association of Sanitarians Annual Fall Meeting**, New Sheridan Hotel, Olathe, KS. For more information, contact Tim Wagner at 800.527.2633.
- **24, Wyoming Environmental Health Association Annual Fall Meeting**, Holiday Inn, Cheyenne, WY. For more information, contact Bryan Grapes at 307.532.4208.
- **29-Oct. 1, Canadian Institute of Public Health Inspectors (CIPHI) Ontario Branch 64th Annual Educational Conference**, Waterloo Inn and Conference Centre, Waterloo, Ontario, Canada. For more information, contact Ken Diplock at 519.883.2008 ext. 5435; E-mail: dken@region.waterloo.on.ca.
- **30-Oct. 2, Washington Association for Food Protection Annual Meeting**, Campbells Resort, Chelan, WY. For more information, contact Bill Brewer at 206.363.5411.
- **30-Oct. 3, Better Process Control School**, University of Nebraska, Lincoln, NE. For general information, contact Pauline Galloway at 402.472.9751; E-mail: pgalloway2@unl.edu.

OCTOBER

- **1-4, The 5th International Symposium on the Epidemiology and Control of Foodborne Pathogens in Pork**, Creta Maris Hotel, Hersonissos, Heraklion, Crete, Greece. For more information, call 30.210.749.93.00; E-mail: congress@triaenatours.gr.
- **2-3, FSIS Verification of HACCP Plans—A Meat and Poultry Industry Workshop**, Omaha, NE. For more information, call 202.393.0890; E-mail: fpi@nfpa-food.org.
- **6-10, Dairy Technology Workshop**, Randolph Associates, Inc., Nashville, TN. For more information, call 205.595.6455; E-mail: us@randolphconsulting.com.
- **7-8, Associated Illinois Milk, Food and Environmental Sanitarians Annual Fall Meeting**, Stoney Creek Hotel, Peoria, IL. For more information, contact John Ellingson at 815.490.5523.
- **8-11, Second International Symposium on Sourdough**, Brussels, Belgium. For more information, call 32.16.204035; E-mail: aacc@scisoc-europe.org.
- **14, SQF Systems Awareness Training**, GFTC, Guelph, Ontario, Canada. For more information, call 519.821.1246; E-mail: gftc@gftc.ca.
- **14-16, Food Security Coordinator Workshop**, Toronto, Canada. For more information, call AIB at 785.537.4750.
- **15-16, Food Allergens: Issues and Solutions for the Food Product Manufacturer**, Hotel Sofitel, O'Hare, Chicago, IL. For more information,

IAFP UPCOMING MEETINGS

AUGUST 10-13, 2003

New Orleans, Louisiana

AUGUST 8-11, 2004

Phoenix, Arizona

AUGUST 14-17, 2005

Baltimore, Maryland

AUGUST 13-16, 2006

Calgary, Alberta, Canada

COMING EVENTS

- contact Pauline Galloway at 402.472.9751; E-mail: pgalloway2@unl.edu.
- **19-22, University of Wisconsin-River Falls 23rd Annual Food Microbiology Symposium**, (Current Concepts in Foodborne Pathogens and Rapid and Automated Methods in Food Microbiology), University of Wisconsin-River Falls. For more information, contact the University of Wisconsin-River Falls Animal and Food Science Dept. at 715.425.3704; E-mail: foodmicro@uwrf.edu.
 - **22, Metropolitan Association for Food Protection Annual Spring Meeting**, Rutgers, Cook College, New Brunswick, NJ. For more information, contact Carol Schwar at 908.689.6693.
 - **14-16, Food Security Coordinator Workshop**, Toronto, Ontario, Canada. For more information, call AIB at 785.537.4750.
 - **27-28, HACCP IV: Validation and Verification of Your HACCP Plan**, GFTC, Guelph, Ontario, Canada. For more information, call 519.821.1246; E-mail: gftc@gftc.ca.
 - **28-30, Applied Extrusion**, University of Nebraska Food Processing Center, Lincoln, NE. For more information, contact Pauline Galloway at 402.472.9751; E-mail: pgalloway2@unl.edu.
 - **28-30, North Dakota Environmental Health Association Annual Fall Meeting**, Spirit Lake Resort, Devil's Lake, ND. For more information, contact Debra Larson at 701.328.6150.
 - **29-30, HACCP V: Effective Auditing of Your HACCP Plan**, GFTC, Guelph, Ontario, Canada. For more information, call 519.821.1246; E-mail: gftc@gftc.ca.
 - **29-30, Iowa Association for Food Protection Annual Fall Meeting**, Ames, IA. For more information, contact Phyllis Borer at 712.754.2511, ext. 33.
 - **29-Nov. 1, Worldwide Food Expo**, McCormick Place, Chicago, IL. For general information, contact Pamela Morrison at 202.220.3532 or go to www.wwfe@idfa.org.
 - **17-21, Brazil Association for Food Protection Annual Meeting**, Centro-Sul Convention Center, Florianopolis, Santa Catarina State, Brazil. For more information, contact Maria Teresa Destro at 55.11.3091.2199.
 - **19, Alabama Association for Food Protection Annual Fall Meeting**, Holiday Inn, Homewood, AL. For more information, contact G. M. Gallaspy at 334.206.5375.
 - **20, Ontario Food Protection Association Annual Fall Meeting**, Mississauga Convention Centre, Mississauga, Ontario, Canada. For more information, contact Glenna Haller at 519.823.8015.
 - **24-25, HACCP III: Train the Trainer**, GFTC, Guelph, Ontario, Canada. For more information, call 519.821.1246; E-mail: gftc@gftc.ca.
 - **24-26, HACCP Principles: Guidelines for Implementation and Use**, GFTC, Guelph, Ontario, Canada. For more information, call 519.821.1246; E-mail: gftc@gftc.ca.
 - **27-28, SQF 1000/2000^{CM} Systems Training**, GFTC, Guelph, Ontario, Canada. For more information, call 519.821.1246; E-mail: gftc@gftc.ca.

NOVEMBER

- **4-6, Food Security Coordinator Workshop**, Sacramento, CA. For more information, call AIB at 785.537.4750.
- **8-9, Mexico Association for Food Protection Annual Fall Meeting**, Mission Carlton Hotel, Guadalajara, Jal. Mexico. For more information, contact Alex Castillo at 979.845.3565.



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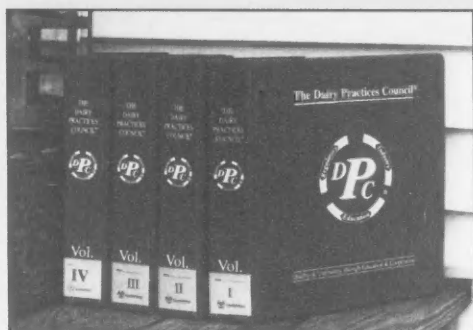
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