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IAFP Foundation FUND

We live in a global economy and the way food is grown, processed, and handled can impact people around the globe. From a public health perspective, it often provides unique challenges to the food safety professional. Combine these issues with the complexity of protecting the food supply from food security threats and the challenges seem overwhelming. However, with your support the Foundation can make an impact on these issues. Funds from the Foundation could help to sponsor travel for deserving scientists from developing countries to our Annual Meeting, sponsor international workshops, and support the future of food scientists through scholarships for students or funding for students to attend IAFP Annual Meetings.

The Foundation is currently funded through contributions from corporations and individuals. A large portion of the support is provided from the Sustaining Members of IAFP. The Sustaining Membership program is a unique way for organizations to partner with the Association. Contact the Association office if you are interested in this program.

Support from individuals is also crucial in the growth of the Foundation Fund. Contributions, big or small, make an impact on the programs supported by the IAFP Foundation. Programs currently supported by the Foundation include the following:

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It is the goal of the Association to grow the Foundation to a self-sustaining level of greater than $1.0 million over the next 10 years. This would allow the Foundation to provide additional programs in pursuit of our goal of *Advancing Food Safety Worldwide*®!

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"A VIEW FROM WISCONSIN"

"What a great meeting!" "I haven't been to this meeting in years, but I'll be back next year." "There are so many good sessions to go to; I can't get everywhere I want to be." These were the types of comments that I heard in the hallways of the convention area of the JW Marriott Desert Ridge Resort in Phoenix, Arizona during our August 2004 Annual Meeting. Yes, this year's meeting was clearly the most successful ever for IAFP in terms of attendance, exhibitors, and sponsorship. This month's issue of *Food Protection Trends* features pictures, reports, and session summaries for those who would like to refresh their memories and for those unfortunate Members who may have missed this premier meeting in food safety.

The August Arizona heat obviously did not deter the hearty professionals in our field. In last month's column, our Executive Director, David Tharp reported we had 1,584 attendees (a 7% increase over 2003), a 20% increase in exhibits, and a 22% increase in sponsorship! But, these numbers are only an indicator of our success. The true success came in the form of a quality educational program, the symposia, the technical presentations, the posters, and the exhibitors who offered explanations of their services and products. Furthermore, the opportunity to network and the camaraderie among the attendees was unsurpassed.

By KATHLEEN A. GLASS
PRESIDENT

"The IAFP Annual Meeting has become the one-stop shopping of professional meetings"

The IAFP Annual Meeting has become the "one-stop shopping" of professional meetings for anyone involved in food protection. We recognize that many of our Members must deal with a large variety of food protection issues in their daily jobs. This year's program, thanks to the Professional Development Groups, ILSI-North America, and active individuals, covered not only food pathogen issues for many commodities and retail food safety, but expanded the food toxicology program. Hot topic issues included discussion of emerging pathogens *Mycobacterium paratuberculosis*, *Enterobacter sakazakii*, and BSE.

Our meeting always provides ample opportunities for professionals to gather and discuss current research and solutions to common problems not covered formally. Since 1990, when I attended my first IAFP conference, I have had the fortune to meet numerous internationally respected scientists. Their advice has been invaluable to my career. But, just as importantly, I have made contacts with experts who can help me with my day-to-day questions such as the best conditions to isolate a fastidious microorganism, why an antimicrobial may be more effective in one food compared with another, or how do Europeans handle a particular food safety issue.

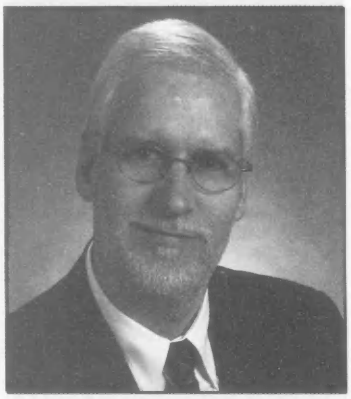
Our Annual Meeting has grown consistently over the past several years, largely in part to the attraction of a first-class educational program, but also because attendees share their enthusiasm with others and promote the meeting among their colleagues. Each year, although I am physically tired from the long hours, I come back energized from the new information I have learned and the new contacts I have made. I know that many of our attendees feel the same way. They encourage their co-workers, their students, the personnel from places that they audit, to join our organization

and to attend our Annual Meeting. I invite you to do the same. Involvement in our association is worth the financial and time commitment because it helps make us better in our jobs and better as individuals. Mark your calendar for next year's meeting in Baltimore, Maryland, August 14–17, 2005, and be sure to invite at least one other person to join us for another successful conference.

Before I close, our thoughts and prayers go out to the people whose lives have been disrupted by the 2004 hurricanes. In particular, we hope that all our friends in Florida escaped the devastation associated with the four hurricanes that have hit the state this season. Agencies responded rapidly after the storm and the residents are resilient, but some areas may be without electricity and basic services for weeks. While government disaster loans will assist in rebuilding the infrastructure, many individuals, especially the poor, may suffer greatly. I ask that you consider donations to a reputable disaster relief fund to assist in their recovery.

As always, I welcome your ideas and comments. Please feel free to E-mail me at kglass@wisc.edu and let me know your view.

"COMMENTARY"
FROM THE EXECUTIVE DIRECTOR



By DAVID W. THARP, CAE
EXECUTIVE DIRECTOR

"There were so many good things that took place this year; it is hard to know where to start!"

It is hard to believe that November is here already, but we must face the facts! This is the beginning of an eventful time for most Members and their families as the holiday season keeps people on the go trying to schedule so many events related to the holidays. Many people request time off of work during this period too, so you see some slow down of work efforts from now until mid-January. That happens at the IAFP office too, but we try to minimize the effects of our reduced staff. Especially since we are already gearing up for IAFP 2005 during this time!

Before we start on IAFP 2005, let's review IAFP 2004. This issue of *Food Protection Trends* contains our recap of IAFP 2004 that was held in Phoenix, Arizona last August. It was our most successful Annual Meeting in the history of the Association on many accounts. Attendance was up by 7% over the prior year, reaching a total of 1,584 attendees. Our Exhibit Hall was filled to the maximum of 128 booth spaces with 110 companies represented. And it is so rewarding to know that our sponsoring companies (see pages 900 through 904) contributed 20% more in sponsorship monies than in the prior year.

Certainly, this success also leads to a few problems. Some attendees who made hotel reservations late were not able to stay in our host hotel, the JW Marriott Desert Ridge Resort and had to commute from off-property. As all conferences encounter, we had some speakers who were unable to be with us in Phoenix and did not send substitutes. That happens and of course we have no control over such situations. Another popular problem is that attendees cannot get to all of the sessions that they want to attend or they are unable to spend as much time in the poster sessions or the Exhibit Hall.

I must say, we don't have solutions to all of those problems, but we continue to address them. We encourage you to make your hotel reservations as early as possible (hotel reservations open in January for IAFP 2005) and, of course, we work with speakers who cancel early to fill the openings. Normally when a speaker does not make it to our Annual Meeting, it is because of an emergency situation. To address the issue of not being able to attend all sessions (including poster sessions) and the Exhibit Hall, we are working towards recording sessions at IAFP 2005! This is one way to allow attendees who are unable to attend conflicting sessions to be able to review some of the information presented during the session they missed.

Now, let's get back to the successes of IAFP 2004. There were so many good things that took place this year; it is hard to know where to start! One that is worth mentioning is the student involvement. Our Student Professional Development Group held a very successful luncheon on Sunday with about 70 people in attendance. In addition, they raised monies to support the first ever, Student Mixer that was held on Tuesday evening. The room was full of students and guests enjoying great food, drink and conversation! Students also assisted in our meeting rooms and provided summaries of the sessions, which are presented beginning on page 849. We want to recognize the efforts of Michelle Danyluk, Renee Raiden, and Ben Chapman who all helped this past year in organizing events and session monitoring for the students. Thanks to all students who assisted during IAFP 2004!

We experienced a magnificent Ivan Parkin Lecture delivered by Martin Cole during the Opening Session. Dr. Cole was with Food Science Australia as the Deputy Chief Executive and recently joined

the Illinois Institute of Technology as the Director of the National Center for Food Safety and Technology. His talk, "Advanced Food Protection Technology" is recapped on page 842. We want to recognize the IAFP Foundation for sponsoring the Ivan Parkin Lecture.

In addition to Dr. Cole, we were fortunate to have Dr. Merle Pierson, USDA Deputy Under Secretary for Food Safety address our attendees in a plenary session to discuss "Food Safety Policy at USDA: The Road from Ambitious Vision to Tangible Results." Dr. Pierson's presentation is summarized on page 846.

Then, on Tuesday afternoon, the inaugural "John H. Silliker Lecture" was delivered by R. Bruce Tompkin. Dr. Tompkin spoke on "Guess Who's Come to Stay – The Resident Pathogen Issue" (page 844). A big thank you to Silliker, Inc. for their sponsorship of the John H. Silliker Lecture. I should also mention that Dr. Silliker was present at IAFP 2004 to witness the origin of this Lecture series. It was indeed a special occasion to have Dr. Silliker at the IAFP Annual Meeting this year!

There were so many excellent sessions, both symposia and technical (oral and poster!), that choices of what presentations to attend when were difficult. The session rooms at the Desert Ridge Resort were large which made it easy to find a seat, even in the most popular sessions. We want to make a special word of thanks for all of our session organizers, convenors, speakers and presenters. Without you, our meeting would not be possible. The latest science, methods and procedures are what attendees thrive upon and IAFP consistently delivers this content!

I mentioned the size and number of exhibitors at IAFP 2004, but I want to sincerely thank our exhibitors for putting forth the effort to be with us in Phoenix. We have a special relationship with our exhibitors as many of the company representatives staffing the booths also participate fully in our Committee and Professional Development Groups and also either attend sessions or give presentations. We are indeed fortunate to have such active support from our exhibiting companies! In addition, many exhibitors also provide sponsorship monies to support events during the Annual Meeting. We truly appreciate our sponsors' assistance and the support of our exhibitors. Both provide assistance for the IAFP Annual Meeting that allows us to do so much for our attendees.

Much of the support monies are directed towards events that add a social element to the Annual Meeting and IAFP 2004 was no exception. Social events were held on Saturday for New Members and first time attendees and for Affiliate Delegates and Officers. On Sunday, the Opening Reception was a grand success with more than 1,200 in attendance. Monday evening for the Social, attendees boarded busses and stepped back in time to the "Old West" at Rawhide Western Town. Tuesday evening, the President's Reception was held and was followed by the Student Mixer. Then to conclude IAFP 2004, the Annual Awards Banquet was held. These social times were in addition to the refreshment breaks that were held in the Exhibit Hall.

Socializing at the IAFP Annual Meeting is one of the most important things that can be done. You never know when you may meet someone who can solve the problem you have been working on for months! Or, you may just meet your new employer among the IAFP attendees.

So, we hope that you were able to be with us in Phoenix for IAFP 2004, but if not, the recap in this issue will help to show you what you missed! If you were at IAFP 2004, the review will jog your memory of the great time we had! Now, be sure to plan ahead to prepare for IAFP 2005 – the dates are August 14–17 and we will be in Baltimore. Registration opens February 1 and program topics will be available at that time, too.

ARTICLES

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International Association for Food Protection

Potential for Use of Hide-Carcass Microbial Counts Relationship as an Indicator of Process Hygiene Performance of Cattle Abattoirs

LUIS VIVAS ALEGRE and SAVA BUNCIC*

Division of Farm Animal Science, School of Veterinary Science, University of Bristol, Langford, Bristol BS40 5DU, United Kingdom

SUMMARY

At a large, modern abattoir (A), thirty-one visually clean beef cattle were slaughtered. Before skinning, whole brisket areas of hide of twenty-nine animals were surface contaminated with a 24-hour broth culture of *Escherichia coli* (K12), by use of a brush, so as to obtain animals with higher microbial levels on hides. The remaining two animals were not contaminated, because of time constraints. At a small, traditional abattoir (B), thirty-one visually clean beef cattle, the hides of which were not artificially contaminated, were slaughtered, so as to obtain animals with lower microbial levels on hides. At both abattoirs, from each animal, three samples (5 cm^2 each) from the brisket area were taken by excision from: a) hide before skinning, b) carcass halfway through skinning, and c) final dressed carcass. In each sample, total count of bacteria (TVC) and *Enterobacteriaceae* count (EC) per cm^2 were determined. The process hygiene performance of each abattoir was assessed by three methods. First, the official UK Hygiene Assessment System (HAS) scoring was conducted by official veterinarians, based on observational assessment (scoring) of the degree of the abattoir's operation compliance with recognized best hygiene practice. Second, the EU microbiological criteria (TVC and EC) were used for final carcasses. Third, newly proposed bacterial output/input factor (BOIF), based on calculation of TVC or EC counts on final dressed carcasses as a proportion of corresponding values on hides before dressing, was used. At abattoir A, final carcasses had higher microbial counts than at abattoir B, due to the much higher microbial levels on artificially contaminated hides. Based on the EU microbiological criteria for final carcasses, therefore, process hygiene performance of abattoir B would be judged better than that of A. However, hygiene performance was better for abattoir A than for B, when either the HAS or the BOIF method was applied. Among the three methods, the BOIF appeared most appropriate for between-abattoir comparison of process hygiene, because it can, and the other two cannot, indicate what proportion of the microbial load on hides is transferred onto corresponding carcasses.

A peer-reviewed article

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TABLE 1. Hygiene assessment scores (HAS) and some general features of the two abattoirs

Feature	Abattoir A	Abattoir B
Total HAS score	90	74
Slaughter line speed	60 animals/hour	3–5 animals/hour
Number of operators on slaughter line	36	5–8
Dehiding system	Hanging on line with final automated upwards hide puller hide pulling	On cradle followed by hanging and manual
Number of operators working on dehiding	8–9	2–3
Duration of dehiding	8 min	12 min
Total time to process one carcass (stun to final wash)	40–50 min	20–35 min
HACCP in place	Yes (since 3 years ago)	Yes (since 2 months ago)

INTRODUCTION

The principal sources of microbial contamination of bovine carcasses are the alimentary tract and the hide *(2, 10)*. Even with good process hygiene, some degree of carcass contamination from these sources during slaughter and dressing is inevitable *(6, 11, 12, 17)*. Carcass contamination from the alimentary tract during evisceration can be prevented or made very infrequent, providing the intestinal tract is not ruptured or punctured *(2, 18)* and its ends are sealed by rodding the esophagus and bunging the anus/rectum. In contrast, contamination from hides during skinning operations is considered as the main contributor to the final microbiological load of the carcasses *(1, 4, 9, 16, 21)*. In a recent study in which marker bacteria were inoculated on hides of cattle during lairaging, an extensive transfer of the hide markers onto resultant carcasses occurred during dressing operations *(5)*.

Animal coats/skins can became contaminated on-farm and/or during the transport-livestock market-lairage phase *(3, 8, 13)*. In the UK, all cattle are assessed for visible cleanliness before slaughter, using a 5-point scoring system implemented by the UK Meat Hygiene Service (MHS). The excessively dirty animals (MHS scores 4 and 5) are not accepted for normal slaughter. However, the visual cleanliness and microbial counts of the hide do not necessarily correlate quantitatively, as different kinds of dirt (e.g., mud, feces and straw) can differ microbiologically. This is confirmed by recent findings that microbial loads on hides of slaughtered cattle considered as visually clean for slaughter (MHS scores 1 and 2) differed by a factor of 166, i.e., ranged from 5.2 to 7.4 log CFU/cm^2 *(21)*.

The MHS uses the Hygiene Assessment System (HAS) to audit abattoirs in the UK, for assessing process hygiene in abattoirs, and for related between-abattoir comparisons. The HAS is a risk-based system designed to measure the degree of abattoirs' operation compliance with recognized best hygiene practice and related legislation under the UK Fresh Meat (Hygiene and Inspection) Regulations. The HAS scoring is based on observational comparison of the actual operations with recognized best practice, and does not include determination of microbiological status of the final carcasses.

Another, parallel system used to assess the process hygiene performance of cattle abattoirs is based on the EU official quantitative microbiological criteria for dressed carcasses and environmental surfaces in the context of HACCP (EU Commission Decision 2001/471/EC, hereafter named the EU microbiological carcass criteria). This system takes into account only the microbiological status of the final carcasses and does not include any data on incoming microbial loads carried by animals presented for slaughter.

It appears logical that an actual process hygiene assessment should be based on determining the difference between the incoming (on animals) and outgoing (on final carcasses) microbial loads, thus measuring the efficacy of the process to minimize the transfer of microbial contamination from non-skinned animals onto resultant carcasses. It could be hypothesized that, in the case of two abattoirs that slaughtered visually clean cattle and produced final carcasses having equal microbial levels, the abattoir that slaughtered animals with significantly higher pre-dressing (i.e., hide) microbial levels actually had significantly better process hygiene performance than the other abattoir. If this is the case, then some between-abattoir comparisons of process hygiene performances based on the current assessment systems (the HAS and the EU carcass monitoring) may contain significant inaccuracies and unfairness.

Therefore, the main aim of this pilot study was to determine the effect of different incoming microbial loads on the results of a between-abattoir comparison of process hygiene performances, using the two current and a newly proposed assessment methods. To do this, we simulated a situation in which two abattoirs slaughtered cattle that did not differ in visual cleanliness but had significantly different levels of microbial loads on hides.

MATERIALS AND METHODS

Abattoirs

The general features for the two commercial abattoirs (A and B) studied are shown in Table 1. Historically, based on general trends from previous audits and

TABLE 2. EU microbiological criteria for beef carcasses*

Daily result (mean log CFU/cm²)	Acceptable range**	Marginal range**	Unacceptable range**
Total viable count of bacteria (TVC)	< 3.5	3.5–5	> 5
Enterobacteriaceae count (EC)	< 1.5	1.5–2.5	> 2.5

* EU Commission Decision 2001/471/EC; The UK Meat Hazard Analysis and Critical Control Point Regulations 2002

** When excision carcass sampling method used

microbiological carcass monitoring, abattoir A (large, modern) was considered to have significantly better process hygiene performance than abattoir B (small, traditional). Visually clean cattle (categories 1 and 2, based on the UK MHS visual cleanliness scoring; see below) routinely presented for slaughter were randomly selected for the study. At each abattoir, 31 cattle (62 in total) were sampled before and after dressing a over 4-day time period.

Artificial contamination of hides

Escherichia coli (strain K12; collection of the School of Veterinary Science, University of Bristol) was incubated in 100 ml of Heart Infusion Broth (Oxoid, Basingstoke) at 37°C for 24 hours and then sub-cultured in 1,000 ml of the same broth, after which was again incubated, under the same conditions. In abattoir A, hide covering the whole brisket area of 29 slaughtered but skin-on cattle (i.e., immediately after exsanguination) was uniformly surface contaminated with the *E. coli* culture, using a paintbrush technique *(19)*. This was done to obtain slaughtered cattle having higher levels of microbial contamination of hides. The remaining 2 animals at abattoir A were not contaminated because of time constraints. In abattoir B, none of the 31 slaughtered cattle was inoculated, to obtain slaughtered cattle having lower levels of microbial hide contamination.

Microbiological sampling of hide

From each animal, approximately 10 cm² of the hide from brisket area was excised, using disinfected (with 70% alcohol-moistened wipes) scalpel and a forceps. Sterile latex gloves were used and changed between animals. The excised piece of hide was placed into a sterile stomacher bag and transported on ice to the laboratory. There, an area of 5 cm² was finally excised from each piece of hide by use of a disinfected cork-borer, and this final hide sample was placed into another stomacher bag. This final hide excision was done in the laboratory so as to obtain the sample size equal to the corresponding dressed carcass sample size; it was impractical to conduct this excision in the abattoir because of line-speed-related time constraints.

Microbiological sampling of dressed carcasses

At each of the two abattoirs, dressed carcasses were sampled at two points: point I, halfway through skinning, where all the ventral and lateral areas of the carcass were skinned but before the final pulling of the hide still attached to the dorsal area of the carcass; and point II, at the end of the slaughter line, where all the dressing and evisceration operations were completed but before the final carcass wash. On each carcass, left and right brisket sides were sampled at points I and II, respectively. Using disinfected instruments, an area of 5 cm² (2 mm depth) was sampled on the brisket area (corresponding to the sample site on hide) by a cork borer, scalpel and forceps. The sample was placed into a stomacher bag and transported to the laboratory on ice.

Microbiological analysis

Twenty ml of Maximum Recovery Diluent (MRD, Oxoid) was added to each sample, which was homogenized for 1 minute in a stomacher (Seward 800; Seward Ltd, Thetford). Subsequently, serial decimal dilutions in the same diluent were prepared. To determine total count of bacteria (TVC), one ml of each dilution was inoculated onto Petrifilm Aerobic Count Plate (3M Health Care, St. Paul, Minnesota) and incubated at 30°C for 48 hours. To determine *Enterobacteriaceae* counts (EC), one ml of each dilution was inoculated onto Petrifilm *Enterobacteriaceae* Count Plate (3M Health Care), and incubated at 37°C for 24 hours. After incubation, bacterial counts (TVC or EC) per cm² of hide or dressed carcass were calculated, taking into account the dilution factors, and counts were then converted to log CFU/cm² before statistical analysis.

Assessment of hygiene performance of abattoirs

The HAS uses a score sheet divided into sections:

A. Risks from animals ante-mortem
B. Risks from animals post-mortem
C. Contamination from personnel
D. Risk associated with the premises
E. Management factors and other general items

Each section is sub-divided further into numerically weighted categories (a, b, c, or d), descriptively defined as follows:

(a) Any risk to public health is controlled by the application of best practice hygiene controls. Any accidental failure of control is immediately corrected.
(b) The risk to public health is controlled but could be minimized further. Occasional failures of control are immediately corrected.
(c) The risk to public health is inappropriately controlled and failures of control are not immediately corrected.
(d) There is a serious risk to public health. The risk to public health is insufficiently controlled, or failures of control are not corrected.

The maximum total HAS score achievable is 100; the higher the score, the better the process hygiene performance of the abattoir.

Hygiene performance of abattoirs is assessed by use of official EU microbiological carcass criteria. The current microbiological criteria used for assessment of abattoir hygiene performance are based on related EU and UK legislation, which provides acceptable, marginal and unac-

TABLE 3. Microbiological levels on hides[a] and corresponding carcasses of tested cattle

Samples	Abattoir A		Abattoir B	
	Mean TVC	Mean EC	Mean TVC	Mean EC
Hides before dressing (n = 31)	8.6[b] ± 0.5	7.9[d]* ± 1.2	6.2[c]* ± 1.1	3.2[e] ± 1.3
Carcasses at point I (n = 31)	3.5 ± 0.8	1.1[d]* ± 1.5	3.4* ± 0.9	0.4[e] ± 0.8
Carcasses at point II (n = 31)	3.8[b] ± 0.7	1.4[d] ± 1.4	3.2[c] ± 1.2	0.4[e] ± 0.7

TVC Total viable count (log CFU/cm² ± SD)

EC *Enterobacteriaceae* count (log CFU/cm² ± SD)

[a] Hides artificially contaminated at abattoir A, but not at abattoir B

[b] and [c] in the same row are significantly different

[d] and [e] in the same row are significantly different

* Significant correlation between values for hides and carcasses in the same column

Point I. Carcass halfway through dehiding

Point II. Completely dressed carcass at the end of slaughter line

ceptable ranges for carcasses sampled after dressing but before chilling (Table 2).

Hygiene performance of abattoirs is also assessed by use of arbitrary "bacterial output/input factor" (BOIF). The BOIF was calculated to roughly estimate the microbial levels on dressed carcasses as a percentage of the microbial levels on the hides (before dressing) of the same animals. The following formula was applied for both TVC and EC:

$$\text{BOIF} = \frac{\text{MMCC} \times \text{MCSS}}{\text{MMHC} \times \text{MHSS}} \times 100$$

Where

MMCC = mean microbial carcass count (CGU/cm²) on the dressed carcasses

MMHC = mean microbial hide count (CFU/cm²) on the same animals pre-dressing

MCSS = mean carcass surface size (in cm²) of the dressed carcasses

MHSS = mean hide surface size (in cm²) of the same animals pre-dressing

For the purpose of this pilot study, the microbial counts on both carcasses and hides were determined only on brisket areas. To simplify the calculation, it was assumed that for each tested animal the overall carcass surface after skinning (i.e., that of dressed carcass) and the overall surface of the hide (which had intimately covered the same carcass before skinning) did not differ greatly. Consequently, it was assumed that these two parameters (MCSS and MHSS) practically "neutralize" each other, so they were actually omitted from the formula/calculation.

Analysis of the results

The results were analyzed by use of SPSS (version 11.5) software. The correlation of variables within the same abattoir and differences in variables between abattoirs were assessed using the Pearson correlation analysis and student's t-test, respectively.

RESULTS AND DISCUSSION

Comparison of process hygiene performances of the two abattoirs using HAS

The visual HAS is used in the UK for systematic and "quantified" observational assessment of process hygiene performance and legislative compliance of individual abattoirs, as well as for related comparisons between abattoirs. In addition, it is believed that it helps the slaughterhouse management to identify the most significant hygiene-related public health risks encountered in the production of fresh meat.

In the present study, the HAS score was markedly higher for abattoir A than for abattoir B (Table 1), which indicates that abattoir A had significantly better process hygiene performance than abattoir B. This was largely due to the fact that abattoir A is much more technologically advanced and has had longer experience with the systematic, HACCP-based approach to process hygiene (Table 1). Among the most obvious differences, particularly relevant is the fact that in abattoir A, a given operator is involved with only a single operation, e.g., skinning, while in abattoir B, a given operator is involved with several different, or sometimes all, dressing operations. There is little doubt that the latter system carries a higher risk of cross contamination than the former.

Although HAS scoring can be affected by the subjectivity and/or experience of the assessor, it has been argued that it enables useful and easy comparison of process hygiene performances between plants *(23)*. In a UK study *(14)*, eleven beef abattoirs were visited on several occasions; each time, they were HAS scored and ten carcasses were microbiologically sampled. There was a significant negative correlation between the HAS scores and the mean total viable counts of bacteria on carcasses, but not between the HAS scores and the numbers of coliform bacteria. The authors concluded that, on a broad basis, HAS scores are undoubtedly useful in predicting the tendencies in hygiene performances of abattoirs.

TABLE 4. Bacterial output/input factors (BOIF)* of the two abattoirs

Abattoir	BOIF	
	Based on total viable counts (TVC)	Based on *Enterobacteriaceae* counts (EC)
A	3.1×10^{-3}	2.2×10^{-4}
B	3.1×10^{-2}	6.5×10^{-2}
A < B in the same column	10-fold (approx.)	300-fold (approx.)

* Calculation described in Materials and Methods

Comparison of process hygiene performances of the two abattoirs using the EU microbiological carcass criteria

Both the mean TVC levels on carcasses and the mean EC levels on carcasses at the end of the slaughter line were significantly higher in abattoir A, than in abattoir B (Table 3). When the official EU microbiological criteria for carcasses are used (Table 2), the mean carcass TVC level in abattoir A was within the marginal and that in abattoir B within the acceptable range. The EC levels on carcasses in both abattoirs were within the acceptable range. Overall, based on microbial counts on carcasses in the context of the EU criteria only, one would judge the process hygiene performance of abattoir B as better than that of abattoir A.

Because the dressing in abattoir A, as assessed by visual observation (HAS scoring, see above), was more hygienic than in abattoir B, the higher microbial levels on final carcasses in abattoir A can be largely attributed to the much (> 100-fold) higher microbiological levels on the hides in abattoir A. As previously stated, these higher microbial levels on hides had been intentionally achieved by artificial hide contamination. It would be interesting to determine whether, and how, microbial levels on final carcasses would differ between the abattoirs if the microbial levels on hides had not differed, but that was not investigated in this pilot study.

The link between microbial levels on hides and on resultant carcasses was supported by statistical correlation of TVC (abattoir B) and EC (abattoir A) levels between hides and carcasses halfway through skinning (Table 3). In contrast, for TVC at abattoir A and EC at abattoir B, similar trends were seen, but these were not statistically significant. The fact that a strong statistical correlation between microbial counts on the hides and on the final carcasses (fully dressed; end of slaughter line) was lacking, but that some correlation between microbial counts on the hides and on the half-skinned carcasses existed (Table 3), indicates that other dressing steps between the skinning point and the dressed carcass sampling point interfered with the hide-final carcass microbiological relationship.

Comparison of process hygiene performances of the two abattoirs using BOIF

In this study, we attempted to assess the process hygiene performance of two abattoirs by estimating the proportion of microbial load on hides (bacterial input) that is potentially transferred on the final carcasses (bacterial output), via simple, arbitrary bacterial output/bacterial input factor (BOIF). The use of BOIF as a process hygiene performance indicator is based on the assumptions that an effective cleaning/sanitation regime was applied overnight and that the alimentary tracts were sealed at both ends and not punctured during evisceration, as would normally be expected. Therefore, the bacterial contamination coming into the slaughterhall would mostly be derived from the cattle hides, as demonstrated in a previous study *(5)*.

The TVC results indicated that the bacterial output (mean carcass TVC) equalled approximately 0.003% of the bacterial input (mean hide TVC) in abattoir A (Table 4), whereas in abattoir B the corresponding BOIF value (0.03%) was approximately ten-fold higher. When EC results were used, there was approximately a 300-fold difference in BOIF values between abattoirs A (0.0002%) and B (0.06%). This means that abattoir A was actually more successful than abattoir B in reducing the global transfer of incoming hide contamination to the final carcasses. In other words, although final carcasses at the end of the slaughter line in abattoir A had somewhat higher bacterial counts than in abattoir B, the production process at abattoir A was inherently more hygienic.

Results from some other published studies indirectly support the assumption that microbial loads on hides should be taken into account when considering the expected carcass contamination levels. A general relevance of excessive dirtiness of animals for increased bacterial loads on resultant carcasses has been stressed *(7, 15, 20, 22)*; some studies, however, have been unable to demonstrate a consistent and direct quantitative correlation between the two *(7, 20, 22)*. Some common problems are associated with interpreting the results from the majority of previous studies investigating quantitative relationships between animal visual cleanliness and bacterial levels on carcasses: (a) hide status was assessed visually and not microbiologically, and the two may not correlate; and/or (b) sampled hides and carcasses did not correspond at the individual animal level; and/or (c) the sampling methods used (e.g., swabbing), had a large inherent variability in bacterial recoveries which could have masked any potential correlations. To minimize such problems, and to quantitatively compare the hygienic status of hides and of carcasses, the same animals would need to be sampled by the same (least-variable, i.e., excision) method both pre- and post-dressing – as was done in this study.

Ranking of the two abattoirs based on the three process-hygiene assessment methods

The assessment of process hygiene performances of the two abattoirs through detailed observational analyses of all the main steps in the slaughter and dressing operations (HAS scoring) clearly indicated that the process was much more hygienic in abattoir A than in abattoir B (Table 5). In accordance with the HAS, the assessment of process hygiene performances via the BOIF also showed that the process was more hygienic in abattoir A than abattoir B. In contrast, when assessment of process hygiene performances was based

TABLE 5. Descriptive comparison of process hygiene performances of the two abattoirs when using different criteria

Process hygiene performance criteria		Comparison of abattoirs A and B	Resulting ranking
HAS scores		A > B	A is better
EU microbiological criteria for final carcasses	TVC	A > B	B is better
	EC	A > B	B is better
BOIF (microbial level on final carcasses as proportion of that on hides)	TVC	A < B	A is better
	EC	A < B	A is better

TVC Mean total viable counts

EC Mean *Enterobacteriaceae* counts

on the microbiological status of the final carcasses only (i.e., via official EU microbiological carcass monitoring), abattoir B apparently performed more hygienically than abattoir A.

Since the HAS scoring is based on evaluating how each process step complies with related scientifically-valid principles of good hygiene practices, and in spite of its certain inherent subjectivity, it should be expected that abattoir A, with markedly better HAS score, produces final carcasses of better microbiological status (or at least not worse) than abattoir B. The failure of this to happen is probably because incoming bacterial loads (on hides) were much higher (approximately 100-fold) in abattoir A than in abattoir B.

The results actually highlight the main fundamental differences in the nature of the HAS- and the EU carcass microbiology-related criteria: (a) the HAS uses observation of the process hygiene but does not utilize any data on actual microbiological status of the final carcasses; (b) the EU final carcass criteria give information on actual microbiological status of the carcass but do not provide any information on how effective the production process was in reducing transfer of incoming contamination onto the carcasses. It looks as if the two systems have different purposes. The HAS may enable ranking of abattoirs according to their process hygiene performances only (and not to end-product), while the EU microbiological criteria may enable ranking of abattoirs according to the final product status only (and not to process operations).

On the other hand, the simple BOIF method utilizes quantitative data on both key aspects: the hygienic status of the final product (i.e., carcass microbiological counts) and the efficacy of the production process in reducing incoming contamination (i.e., carcass-hide microbiological difference). Although the present initial study demonstrated the potential of the BOIF-based assessment for comparison of process hygiene performances of cattle abattoirs, the results were obtained only on two abattoirs and using artificial hide contamination. In addition, only relatively small areas of hide/meat were sampled in the present study (a pilot investigation considering the potential of a novel principle rather than its full validation) while sampling of larger areas would have reflected the non-uniform nature of microbial distribution on hide/carcass more accurately. Therefore, further research is necessary to confirm and validate these findings on a larger scale and under varied commercial conditions.

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REFERENCES

1. Avery, S. M., A. Small, C.-A. Reid, and S. Buncic. 2002. Pulsed-field gel electrophoresis characterization of shiga toxin-producing *Escherichia coli* O157 from hides of cattle at slaughter. J. Food Prot. 65:1172–1176.
2. Bell, R. G. 1997. Distribution and sources of microbial contamination on beef carcasses. Soc. Appl. Bacteriol. 82:292–300.
3. Berends, B. R., H. A. P. Urlings, J. M. A Snijders, and F. van Knapen. 1996. Identification and quantification of risk factors in animal management and transport regarding *Salmonella* in pigs, p. 79–96. *In* Hinton, M. H. and C. Rowlings (eds). 1996. Factors Affecting the Microbiological Quality of Meat. 1. Disease Status, Production Methods and Transportation of the Live Animal. EU Concerted Action CT94-1456: Microbial Control in the Meat Industry. University of Bristol Press, Bristol.
4. Biss, M. E., and S. C. Hathaway. 1995. Microbiological and visible contamination of lamb carcasses according to preslaughter presentation status: Implications for HACCP. J. Food Prot. 58:776–783.
5. Collis, V. J., C.-A. Reid, M. L. Hutchison, M. H. Davies, K. P. A. Wheeler, A. Small, and S. Buncic. 2004. Spread of marker bacteria from the hides of cattle in a simulated livestock market and at an abattoir. J. Food Prot., in press.
6. Dixon, Z. R., G. R. Acuff, L. M. Lucia, C. Vanderzant, J. B. Morgan, S. G. May, and J. W. Saell. 1991. Effect of degree of sanitation from slaughter through fabrication on the microbiological and sensory characteristics of beef. J. Food Prot. 54:200–207.
7. Donkersgoed, J. van, K. W. F. Jericho, H. Grogan, and B. Thorlakson. 1997. Preslaughter hide status of cattle and the microbiology of carcasses. *J. Food Prot.* 60:1502–1508.
8. Edwards, D. S. 1996. Farm factors affecting the hygiene status and microbiological safety of red meat, p. 79–96. *In* Hinton, M. H. and C.

Rowlings (eds). Factors Affecting the Microbiological Quality of Meat. 1. Disease Status, Production Methods and Transportation of the Live Animal. EU Concerted Action CT94-1456: Microbial Control in the Meat Industry. University of Bristol Press, Bristol.

9. Elder, R. O., J. E. Keen, G. R. Siragusa, G. A. Barkocy-Gallagher, M. Koohmaraie, and W. W. Laegreid. 2000. Correlation of enterohemorrhagic *Escherichia coli* O157 prevalence in feaces, hides, and carcasses of beef cattle during processing. Proceedings of the National Academy of Science 97:2999–3003.
10. Empey, W. A., and W. J. Scott. 1939. Investigation on chilled beef I. Microbial contamination acquired in the meat works. Bulletin no.126, Council for Scientific and Industrial Research, Australia.
11. Eustace, I. J. 1981. Control of bacterial contamination of meat during processing. Food Technol. Australia 33:28–32.
12. Gill, C. O., J. C. McGinnis, and M. Badomi. 1996. Assessment of the hygienic characteristics of a beef carcass dressing process. J. Food Prot. 59:136–140.
13. Hannan, J. 1996. Factors affecting the prevalence of *Escherichia coli* O157:H7 on farms and carcass meat, p. 27–31. *In* Hinton, M. H. and C. Rowlings (eds). Factors Affecting the Microbiological Quality of Meat. 1. Disease Status, Production Methods and Transportation of the Live Animal. EU Concerted Action CT94-1456: Microbial Control in the Meat Industry. University of Bristol Press, Bristol.
14. Hudson, W. R., G. C. Mead, and M. Hinton. 1996. Relevance of abattoir hygiene assessment to microbial contamination of British beef carcases. Vet. Rec. 139: 587–589.
15. Kain, M. L., S. L. Kochevar, J. N. Sofos, K. E. Belk, C. Rossiter, J. O. Reagan, and G. C. Smith. 2001. Relationships of live animal scores for ambulatory status, body condition, hide cleanliness, and fecal matter consistency to microbiological contamination of dairy cow carcasses. Dairy, Food Environ. Sanit. 21:990–996
16. Korsak, N., G. Daube, Y. Ghafir, A. Chahed, S. Jolly, and H. Vindevogel. 1998. An efficient sampling technique used to detect four foodborne pathogens on pork and beef carcasses in nine Belgian abattoirs. J. Food Prot. 61:535–541.
17. Kriaa, H., J. F. Arthaud, and J. Fournaud. 1985. Contamination and bacterial retention capacity of beef carcasses at the abattoir. J. Appl. Bacteriol. 59:23–28.
18. Nottingham, P. M., N. Penny, and J. C. L. Harrison. 1974. Microbiology of beef processing: I. Beef dressing hygiene. N. Z. J. Agric. Res. 17:79–83.
19. Reid, C.-A., S. M. Avery, M. L. Hutchison, and S. Buncic. 2002. Evaluation of sampling methods to assess the microbiological status of cattle hides. Food Cont. 13:405–410.
20. Ridell, J., and H. Korkeala. 1993. Special treatment during slaughtering in Findland of cattle carrying and excessive load of dung: meat hygiene aspects. Meat Sci. 35:223–228.
21. Small, A., B. Wells-Burr, and S. Buncic. 2004. An evaluation of selected methods for the decontamination of cattle hides prior to skinning. Meat Sci., in press.
22. Sofos, J. N., K. E. Belk, C. Rossiter, J. O. Reagan, and G. C. Smith. 2002. Live dairy cull cow characteristics and associated microbial contamination, p. 330–333. *In* Smulders, J. F. M., and J. D. Collins (eds). 2002. Food Safety Assurance in Pre-Harvest Phase. Wageningen Academic Publishers, Wageningen.
23. Soul, P. 1996. The UK hygiene assessment system, p. 79–96. *In* Hinton, M. H., and C. Rowlings (eds). Factors affecting the microbiological quality of meat. 2. Slaughter and dressing. EU Concerted Action CT94-1456: Microbial Control in the Meat Industry. University of Bristol Press, Bristol.

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Restaurant-associated Outbreak Possibly Linked to Methomyl Poisoning, Ohio, 2000

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SUMMARY

Sixty-eight percent of foodborne outbreaks reported to CDC each year have no etiology identified. A subset of these is comprised of outbreaks with rapid onset and short duration. Differences exist in the identification of the cause of these outbreaks from traditional foodborne outbreaks. This study examined a foodborne outbreak associated with the carbamate pesticide methomyl at a restaurant in Columbus, Ohio, during October 2000. We conducted a case-control study and targeted laboratory testing of clinical and food specimens. We identified 25 patients and 48 controls. The most common symptoms were nausea (84%) and vomiting (52%). The median incubation period was 30 minutes. The house salad was statistically implicated (Odds Ratio = 8.9; 95% Confidence Interval =1.1–198). Methomyl was detected in two salad samples and an ill patron's vomitus. Methomyl-containing fly bait was in use at the restaurant. In summary, a salad contaminated with methomyl likely caused an outbreak of gastrointestinal illness with rapid onset and short duration. Identifying the cause of foodborne chemical outbreaks depends on early suspicion, collection of appropriate specimens, and laboratory procedures that detect a range of likely agents.

INTRODUCTION

Sixty-eight percent of foodborne disease outbreaks reported to CDC each year have no etiology identified *(18)*. One explanation may be failure to collect appropriate specimens for diagnosis *(18)*. Hall and colleagues reported that 12% of outbreaks of unknown etiology have incubation periods of fewer than 9.5 hours *(10)*. Possible etiologies of outbreaks with rapid illness onset and short duration include a large number of bacterial toxins, drugs, pesticides, and plant toxins.

On Wednesday, October 25, 2000, several patrons of Restaurant A in Columbus, Ohio, reported vomiting either during or soon after their meals. Restaurant A closed early and the staff discarded various prepared menu items, hoping to eliminate the source of illness. The restaurant reopened the following day, but more patrons vomited. On October 26, the management of Restaurant A notified the Columbus Health Department (CHD). The same day, CHD staff closed the restaurant, conducted an inspection, collected food and water samples, and interviewed the restaurant manager regarding the outbreak. During a follow-up interview with CHD staff on October 27, the restaurant manager ate a house salad with a glass of water, and then vomited. Although the

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TABLE 1. Comparison of demographic characteristics between ill and well patrons of Restaurant A

	Ill patrons (n=25)	Control (n=48)	*P*-value
Percent female	64%	38%	0.03*
Mean age (Median)	51 (50)	48 (48)	0.47†
Mean weight (Median), kg‡	73 (69)	82 (80)	0.17†
Mean height (Median), cm‡	170 (170)	170 (173)	0.92†

*P-value from Pearson's chi-square

†P-value from Student's *t*-test for comparison of means

‡Self-reported

vomitus could not be recovered, the remaining salad was collected and tested.

After following the recommendations of the sanitarian from the CHD Food Safety Program involved in the investigation, the restaurant re-opened on October 28. Again, patrons began vomiting and the restaurant was closed until the cause of the outbreak could be determined. The CHD and Ohio Department of Health (ODH) invited the Centers for Disease Control and Prevention to assist in the investigation on October 30, 2000.

MATERIALS AND METHODS

Hypothesis generation and case finding

To develop hypotheses regarding the cause of the outbreak, we contacted several ill patrons who had complained to the restaurant. In addition, we interviewed ill employees. This information was used to develop a standardized questionnaire. We identified other ill patrons by contacting all patrons who had complained to Restaurant A management, through meal companions, through restaurant reservation lists, and by credit card receipts.

Case-control study

To determine risk factors for illness, we conducted a case-control study. We defined a case as nausea or vomiting in a patron of Restaurant A who dined there on October 25 through October 28, 2000. A control was a patron of Restaurant A who dined during the same period but denied nausea or vomiting. Questions covered demographic information, a brief medical history, and food and beverages consumed at Restaurant A. All 76 food items on the menu were included on the questionnaire.

Environmental investigation

Restaurant management and kitchen staff were extensively interviewed regarding food preparation methods, sanitizing procedures, and pest control. All employees were questioned regarding recent illness and food handling practices. Since intentional poisoning could explain the rapid onset of symptoms and repetitive nature of the outbreak, we also questioned employees and management about disgruntled employees and conflicts among the staff, and informed the Federal Bureau of Investigation, the Food and Drug Administration (FDA), and local law enforcement of our concerns.

Food handling procedures, sanitation, and the physical layout of the restaurant were inspected to ensure compliance with local health code. This part of the investigation included an inspection of the plumbing system at the restaurant by representatives of the Columbus Division of Water (CDW).

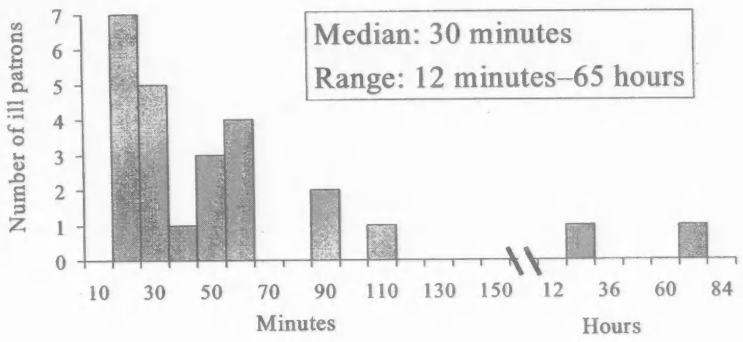
To guide laboratory testing, we reviewed the literature regarding known toxins that cause rapid onset of gastrointestinal distress and queried Food Poisoning Advisor (Michigan State Department of Agriculture, Lansing, MI), a computer program designed to search a database of foodborne pathogens for specific symptoms. We developed a list of potential agents and looked for these agents at the restaurant. The material safety data sheets (MSDS), informational sheets on potentially toxic products in a workplace, were reviewed as part of this process. The Occupational Safety and Health Administration requires employers to maintain a current MSDS file.

Laboratory investigation

Food samples were cultured for bacteria, including *Staphylococcus aureus* and *Bacillus cereus*, at the ODH laboratory, using standard methods *(21)*. Samples were tested for nitrites, sulfite, and pesticides. Chromatography and mass spectrometry *(11, 13)* were used to test for pesticides, including organophosphates and carbamate pesticides, at the California Animal Health & Food Safety Laboratory System (CAHFSL) of the University of California, Davis, and the Food and Drug Administration National Toxicology Laboratory in Cincinnati. Salad samples were visually inspected for the presence of toxic plants by a University of Georgia toxicologist specializing in poisonous plants. Water samples were tested at CDW for pH and for the presence of copper, using atomic absorption *(1)*.

Stool samples from four ill persons were cultured for bacterial pathogens at the Ohio Department of Health Laboratory. Vomitus from one ill patron was tested for the presence of *Staphylococcus aureus* and *Bacillus cereus* and their toxins, as well as for emetine (ipecac), by thin-layer chromatography at the ODH laboratory *(7)*. This same vomitus specimen was tested for organophosphates and carbamate pesticides at CAHFSL. The National Center for Environmental Health used the same technique in testing a second vomitus specimen.

FIGURE 1. Incubation periods for ill patrons of Restaurant A, October 2000 (n=25)



Estimation of ingested dose

Because methomyl breaks down chemically over time *(14)* and samples of salad were tested 21 days after they had caused the manager to vomit, to calculate the average dose at the time of consumption we multiplied the concentration of methomyl detected in food samples by the median amount of salad consumed, applied the half-life function for methomyl *(14)*, and divided the result by the median body weight of ill patrons.

Statistical analysis

Statistical analyses were conducted using STATA version 7.0 (STATA Corporation, College Station, TX). We calculated Pearson's chi-square, odds ratios (OR), and their exact 95% confidence intervals (95% CI). For continuous data we used a Student's *t*-test to compare means and report the associated *P* values. We constructed a multivariate model that included all food and beverage exposures on both the lunch and dinner menus that were significantly associated with illness in univariate analysis (*P* value < 0.1). Age, sex, self-reported weight and height, and amount of food items consumed were also included in the model. The model was reduced by manual stepwise logistic regression; variables dropped from the model were re-entered in a stepwise, forward manner to ensure that no variables were dropped because of the sequence in which they were added to the model. A *P* value of < 0.05 was the criterion used for maintaining an exposure variable in the model.

RESULTS

Case-control study

We identified 73 persons who dined at Restaurant A during the outbreak period. Twenty-five persons reported illness that met the case definition, and these individuals were included in the study. The median age of ill persons was 50 years (range, 29–77), and 64% were female (Table 1). The median incubation period was 30 minutes (range, 12 minutes–65 hours) (Fig. 1). Although several ill patrons reported vomiting before they were served their entrée, only one ill patron vomited in the dining area. Symptoms reported among the 25 included nausea (21; 84%), vomiting (13; 52%), fatigue (6; 24%), flushing (6; 24%), diarrhea (4; 16%), weakness (4; 16%), headache (3; 12%), lightheadedness (3; 12%), increased perspiration (2; 8%), increased salivation (1; 4%), and increased thirst (1; 4%). Ill patrons denied symptoms of metallic taste, numbness, tingling, paresthesia, or paralysis. The median duration of symptoms was 2 hours (range, 6 minutes–48 hours). There were no hospitalizations, and all ill persons recovered.

We enrolled the remaining 48 well persons as controls. Ill patrons were more likely to be female (OR=3.0; 95% CI = 0.90–9.2; *P* = 0.03), but were similar to controls with respect to other demographic information. Univariate analysis revealed that patients were significantly more likely than controls to have eaten the house salad. Twenty-four of 25 ill patrons (96%) had eaten the house salad, compared to 35 of 48 controls (67%) (OR = 8.9; 95% CI=1.1–198; *P* = 0.03). Twenty-one of 25 ill patrons (84%) reported they ate at least 2 cups of the house salad (1 serving). No other food, beverage, or condiment, including salad dressings, was significantly associated with illness.

The house salad ingredients were romaine lettuce, julienne carrots, beets, and mesclun greens. The romaine lettuce, beets, and carrots were used in other menu items that were not associated with illness. The mesclun greens were a mix of different plants that have a high oxalate content that give them a characteristic bitter taste. The one ill person who did not eat the house salad ate a turkey sandwich and reported eating mesclun greens that were served as a garnish.

Multivariate analysis with stepwise elimination identified two independent risk factors for illness: consumption of the house salad (OR = 10.6; 95% CI = 1.3 – 90; *P* = 0.03) and female gender (OR = 3.2; 95% CI = 1.1–9.4; *P* = 0.02). We were unable to demonstrate an increased risk of illness with increasing ingested amounts of salad adjusting for weight and height; however, 34 (47%) study participants did not report their weight.

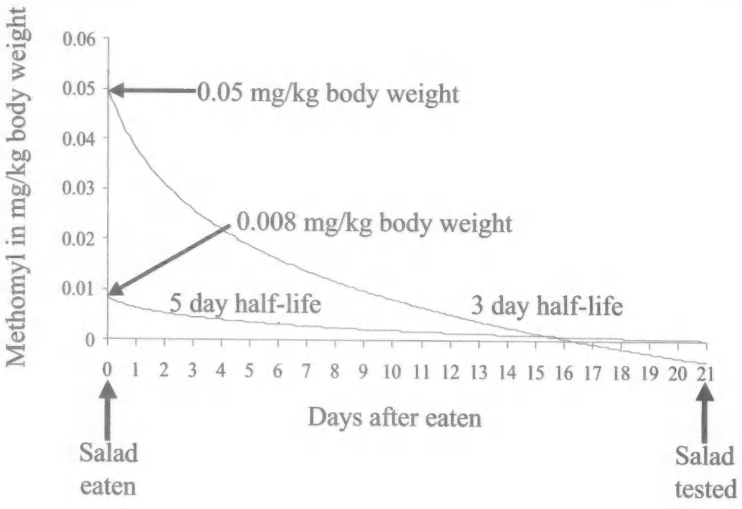
Review of the investigation results with law enforcement did not reveal sufficient evidence to suggest that this was an intentional contamination event.

Environmental investigation

An inspection of the facility conducted on October 26 revealed several plumbing deficiencies. The food preparation sink had been moved and reinstalled without an air gap. Air gaps, which are required to prevent backflow into the potable water system, were also missing from the main ice machine and the ice bin at the main service station. These and other deficiencies were corrected before the restaurant reopened on October 28, when vomiting recurred.

A review of the MSDS from the restaurant revealed that methomyl-containing fly bait was in use. A 1-kg container of the fly bait was found in a storage area, separated from where food items and ingredients were kept. The bait was used to control flies around a dumpster located near the rear entrance of the building. According to restaurant staff, the bait was scooped out of the container either by bare hand or with a spoon, and spread on the ground around the dumpster. The spoon, which was reportedly stored with the fly bait, could not be found. While

FIGURE 2. Estimated ingested dose using the median weight of 69 kg for ill patrons, a salad portion size of 0.15 kg, and the 3–5 day half-life of methomyl



the management usually dispersed the fly bait, one kitchen staff member who sometimes prepared salads occasionally dispensed the fly bait. This kitchen worker reported not preparing salad during the period of the outbreak. At the time of the inspection, fly bait was observed near the back door where deliverymen sometimes left produce and other shipments.

We reviewed the restaurant's receiving records to identify the source of the ingredients of the house salad and contacted several area restaurants that may have received the same lot of produce. No additional area restaurants that received produce from the same distributors reported illness among patrons. Moreover, CDC's Foodborne Outbreak Reporting System received no additional reports of outbreaks with rapid onset of gastrointestinal symptoms elsewhere in the United States during the same time period.

Laboratory investigation

Water samples from the restaurant, including a separate ice sample, had pH and copper levels similiar to those of the Columbus municipal water. Two samples of the house salad were negative for toxic plants by visual inspection. A sample of the house salad that caused the manager to vomit was positive for the carbamate pesticide methomyl at 0.05 ppm, and the stock house salad, from which it came, was positive at 0.18 ppm. No other pesticides were detected in these salad samples. Control samples of unopened mesclun lettuce and unopened romaine lettuce found at the restaurant at the time of the outbreak were negative for methomyl. These samples were not necessarily from the same delivery or even the same supplier as those that tested positive. Samples of house dressing, salt, and pepper were also negative for methomyl. The commercial fly bait found at the restaurant was a blue granular formulation, 0.5% by weight methomyl, according to the label. We analyzed the compound and detected 10,000 ppm methomyl. Colony counts and toxin levels of *Bacillus cereus* and *Staphylococcus aureus* were unremarkable for all foods tested.

Four stool samples collected from ill patrons did not yield *Escherichia coli* O157:H7, *Campylobacter*, *Shigella*, or *Salmonella*. Colony counts and toxin levels of *Bacillus cereus* and *Staphylococcus aureus* were normal in the one vomit sample tested. One of 2 vomitus samples from ill patrons was positive for methomyl at 0.04 ppm. The positive sample was tested 53 days after it was collected.

Estimation of ingested dose

The median weight of ill patrons was 69 kg (152 lbs) (Table 1); given the median amount of salad consumed of 0.15 kg (2 cups) and the measured concentration of methomyl in the salad of 0.18 ppm (mg/kg), we calculated the average dose of methomyl consumed to be 0.0004 mg/kg of body weight. However, methomyl is subject to chemical decomposition when exposed to light, water, chlorine, high temperature, and alkaline pH. Given the 21-day delay in testing and the exposure of the compound to water in the salad and light during testing, we adjusted for decomposition. With a 3–5 day half-life *(14)*, we estimated that the concentration of methomyl in the salad at the time of ingestion was 3.5 to 23 ppm (mg/kg). After the adjustment, the ingested dose at the time of consumption was estimated at 0.008 to 0.05 mg methomyl/kg of body weight (Fig. 2).

DISCUSSION

An acute gastrointestinal illness with a short incubation period occurred in a Columbus restaurant during October 2000. Our case-control study revealed a strong association between illness and consumption of the house salad. The rapid onset of vomiting suggested a preformed microbial toxin, a plant toxin, or other chemical agent might be the cause. Specifically, bacteria, such as *Bacillus* and *Staphylococcus* species; chemicals, such as heavy metals and nitrites; drugs, such as ipecac, which is used to induce vomiting; pesticides, such as carbamates and organophosphates; and plant toxins, such as saponins, the toxic components of pokeweed, were suspected and tested for during the investigation. We guided our laboratory testing by inspecting the restaurant for toxins that might have caused the observed symptoms. In our search for the cause, we learned that carbamate pesticides are not part of a routine pesticide screen and an extended screen must be requested if these compounds are suspected.

Methomyl, a carbamate pesticide, was detected in vomit and two house salad samples. The house salad was the only menu item statistically implicated in our case-control study; 24 of 25 ill patrons had eaten this salad. Additional anecdotal data indicated that several patrons vomited after eating the house salad but before eating their entrée. Lastly, during an interview, a manager consumed the house salad and promptly vomited; this salad sample was tested and found to contain methomyl. The only ill patron who did not eat the house salad reported eating mesclun, an ingredient in the house salad that was served as a garnish. The other ingredients in the house salad — romaine lettuce, carrots, and beets — were used in other menu items but were not associated with illness. Anecdotal reports from the local mesclun distributor and national surveillance data suggest that the

outbreak was limited to Restaurant A. Unopened packages of mesclun greens found at the restaurant at the time of the outbreak, not necessarily from the same source as that used to make the implicated salad, were negative for the pesticide. Methomyl was the active ingredient in fly bait routinely used at the restaurant, and several possible mechanisms for contamination of the house salad were identified, including application of the fly bait where the mesclun crates were delivered or hand dispersal of the fly bait followed by salad preparation with contaminated hands.

Foodborne carbamate poisonings have been reported in the United States *(8)* and elsewhere in the world *(5, 19)*. Buchholz and colleagues *(4)* recently reported 108 cases of acute gastrointestinal illness due to intentional methomyl poisoning by a disgruntled employee at a restaurant in late December 1998. The incubation period and symptom profile for ill persons was similar to the outbreak we describe. Also similar to the outbreak we report here, symptoms consistent with acetylcholinesterase inhibition were rare: paresthesia, 2%; increased perspiration, 2%; blurry vision, 2%; droopy eye lids, 1%; and dry mouth, 1% *(4)*. Unlike organophosphates, carbamate binds to receptors reversibly and the binding is short-lived; as a result, carbamates are less likely to cause symptoms of acetylcholinesterase inhibition *(9)*. Carbamates also differ from organophosphates in that they do not penetrate the blood-brain barrier and therefore are unlikely to result in neurologic symptoms except in massive exposures *(9)*. The lethal dose of methomyl in humans has been estimated to be between 12 and 15 mg/kg of body weight *(13)*. In the outbreak described by Buchholz et al. the estimated dose that would result in 50% of exposed persons developing symptoms was 0.09–0.31 mg methomyl/kg of body weight *(4)*.

Methomyl is widely used in agriculture, and 100% of non organically grown lettuce grown in the United States is treated with methomyl *(6)*. Although we did not detect methomyl on control samples of salad, minimal residual amounts of pesticides on produce for human consumption are allowed. The current allowable daily intake is 0.008 mg methomyl/kg body weight/day *(12)*, an amount derived from a complete review of toxicological data, including animal experiments and human exposure *(22)*. The level at which the most sensitive species does not develop any adverse effect is used as the starting point for determining the allowable daily intake. For methomyl, the level is then lowered by an additional safety factor of 300 in order to protect the consumer *(6)*. A study to detect the chronic effects of methomyl in dogs revealed that a daily dose of 2.5 mg/kg of body weight/day resulted in no observed adverse effect *(6)*. It is important to note, then, that the estimated ingested doses from both the outbreak presented here and the outbreak described by Buchholz and colleagues *(4)* fall well below the no observed adverse effect level (NOAEL) from animal studies *(6)*. This may be due to interspecies variation in response, which would suggest that humans are more sensitive to the compound than dogs. Indeed, the lowest dose at which health effects were observed in dogs was 10 mg/kg of body weight *(6)*, which is similar to the lethal dose in humans *(13)*.

In its dry form, methomyl remains stable for months. In the outbreak described by Buchholz et al., the salt was tainted with methomyl *(4)*; therefore, the estimated ingested dose did not require adjustment for delayed testing. When exposed to heat, light, water, or alkaline pH, methomyl degrades rapidly *(14)*. Free chlorine, the active component of chlorinated water, also accelerates the breakdown several log-fold *(15)*. On a leaf of lettuce in the field, methomyl has a half-life of 3–5 days *(14)*. The salad sample in the Ohio outbreak was tested 21 days after the salad caused the manager to vomit. During that time, it remained in contact with chlorinated water and was exposed to heat and light during service, testing, and transport. In addition, the ingested methomyl was exposed to the low pH of gastric juices. There is no data on the effect of such very low pH. The samples were also mailed from Ohio to Georgia and from Georgia to Northern California; although sent on ice via express mail, they remained unrefrigerated during shipping. For these reasons, the test results may not accurately reflect the amount of methomyl present on the salad at the time of ingestion.

The precise mechanism of how methomyl contaminated the house salad is unknown. It is possible that methomyl from the fly bait may have been unintentionally introduced on the hands of restaurant staff who may have handled the pesticide prior to preparing salads. Alternatively, the bottom of boxes of mesculun delivered and left on the ground at the rear entrance may have become contaminated with methomyl, which had been spread there to control flies. In turn, the boxes may have contaminated the salad preparation table when placed there for unpacking.

Difficulties encountered during the investigation included specimen collection and storage, and delays in testing. We were fortunate to have vomitus specimens available for testing; more often than not, such specimens are not available. However, methomyl, like many other pesticides and toxicants, can be detected in urine *(9, 16)*. Although rapid degradation is still a problem, specimen collection is much simpler. In the context of an outbreak with rapid onset and short duration, immediate collection of urine samples is an alternative to testing of vomitus. Since 90% of methomyl is excreted by the kidneys within 3 days *(17)*, rapid specimen collection is essential. Because heavy metals can cause outbreaks with rapid onset and short duration *(2, 3, 20)*, urine should be collected in containers free of such compounds or pretested for background levels. In addition, carrying an unused sample collection container, or field blank, into the field during the collection will allow for a more accurate estimate of the dose of contaminant by providing the ability to subtract the background levels of the contaminant from the measured result. For additional guidance during specimen collection, please see our Web site at http://www.cdc.gov/foodborneoutbreaks/guide_sc.htm.

A large number of potential etiologic agents can cause an outbreak with rapid onset of gastrointestinal symptoms. Determining the agent in a cost-effective, time-efficient manner requires an increased awareness of these agents, their symptom profiles, and knowledge of appropriate sample collection and testing techniques. We reviewed the environmental data, especially the MSDS sheets, reviewed the literature, and utilized software to guide the laboratory testing during this investigation. In future outbreaks, collection of urine for testing of methomyl and other chemicals may provide a simple method of exposure assessment during an outbreak investigation. Consideration of, and testing for, chemical agents may reduce the number of outbreaks that remain unexplained.

ACKNOWLEDGMENTS

The authors thank Columbus Health Department epidemiologists Ben DeJesus, Michelle Groux, Suellen Bennett, and Evette Larry for their assistance on the investigation, and Dr. Larry Thompson at the University of Georgia, Tifton, for guidance with laboratory testing.

REFERENCES

1. American Public Health Association. 1998. Standard methods for the examination of water and wastewater, 20 ed. American Public Health Association. Washington, D.C.
2. Barker, E. J., and V. Runte. 1972. Tomato juice associated gastroenteritis, Washington and Oregon, 1969. Am. J. Epidemiol. 96:219–226.
3. Brown, M., J. Thom, G. Orth, P. Cova, and J. Juarez. 1964. Food poisoning containing zinc contamination. Arch. Env. Health 8:657–660.
4. Buchholz, U., J. Mermin, R. Rios, T. Casagrande, F. Galey, M. Lee, et al. 2002. An outbreak of foodborne illness associated with methomyl-contaminated salt. J. Am. Med. Assoc. 288:604–610.
5. Davidson, W., A. C. Ellington, D. Manley, W. Patterson, and V. Worsley. 1977. Foodborne pesticides poisoning—Jamaica. MMWR. 26:317.
6. Environmental Protection Agency. 1998. Reregistration Eligibility Decision (RED) Methomyl. Vol. 2003: United States Environmental Protection Agency.
7. Frei, R., W. Santi, and M. Thomas. 1976. Liquid chromatography of dansyl derivatives of some alkaloids and the application to the analysis of pharmaceuticals. J. Chromatogr. 116:365–377.
8. Goes, E., E. Savage, G. Gibbons, M. Aaronson, S. Ford, and W. Wheeler. 1980. Suspected foodborne carbamate pesticide intoxications associated with ingestion of hydroponic cucumbers. Am. J. Epidemiol. 111:254–260.
9. Goldfrank, L., N. Flomenbaum, N. Lewin, M. Howland, R. Hoffman, and L. Nelson. 2002. Goldfrank's Toxicologic Emergencies, 7th ed. McGraw-Hill. New York.
10. Hall, J., J. Goulding, N. Bean, and R. Tauxe. 2001. Epidemiologic profiling: evaluating foodborne outbreaks for which no pathogen was isolated by routine laboratory testing: United States, 1982–9. Epidemiol Infect. 127:381–387.
11. Holstege, D. M., D. L. Scharberg, E. R. Tor, L. C. Hart, and F. D. Galey. 1994. A rapid multiresidue screen for organophosphorus, organochlorine, and *N*-methyl carbamate insecticides in plant and animal tissues. J. AOAC Int. 77:1263–1274.
12. Kidd, H., and D. James. 1991. The Agrochemical Handbook. Royal Society of Chemistry Information Services, Cambridge, UK.
13. Liddle, J., R. Kimbrough, L. Needham, R. Cline, A. Smrek, and L. Yert, et al. 1979. A fatal episode of accidental methomyl poisoning. Clin Toxicol. 15:159–67.
14. Litchfield, M. 1996. Methomyl. World Health Organization, Geneva.
15. Miles, C., and W. Oshiro. 1990. Degradation of methomyl in chlorinated water. Environ Toxicol Chem. 9:535–540.
16. Morgan, D. 1982. Recognition and management of pesticide poisonings, p. 9–13. *In* 3rd ed. United States Environmental Protection Agency. Washington, D.C.
17. Nye, D., and H. Dorough. 1976. Fate of insecticides administered endotracheally to rats. Bull Environ. Contam. Toxicol. 15:291–296.
18. Olsen, S., L. MacKinnin, J. Goulding, N. Bean, and L. Slutsker. 2000. Surveillance for foodborne disease outbreaks–United States, 1993–1997. MMWR. 49:1–62.
19. Swaddiwuthipong, W., A. Ittiravivongs, P. Kunasol, and R. Supachai. 1988. Surveillance of food poisoning outbreaks in Thailand 1981–1986. Southeast Asian J. Trop. Med. Publ. Hlth. 19:327–31.
20. Tartakow, I. 1969. Eleven vomiting caddies. Am. J. Publ. Hlth. 59:1674–1677.
21. US Food and Drug Administration. 1998. Bacteriological and analytical manual-8. Association of Analytic Communities International. Gaithersburg, Maryland.
22. World Health Organization. 1997. Guidelines for predicting dietary intake of pesticide residues (revised). World Health Organization. Geneva.

IAFP 2004 Snapshots

Phoenix in August?! That was the comment we heard over and over as we planned for IAFP 2004 at the new JW Marriott Dessert Ridge Resort and Spa in Phoenix, Arizona. It obviously did not scare people away as we are proud to announce IAFP 2004 was another record-breaking year!! Final attendee count was 1,584, a 7% increase over the prior year! It was also a record-breaking year in sponsorship and number of exhibitors with 110 companies present in the Exhibit Hall. Thank you to everyone who contributed to making IAFP 2004 an overwhelming success!

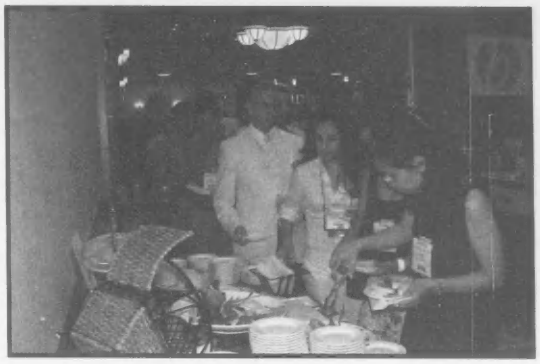
Many attendees took advantage of workshops preceding IAFP 2004. Workshops included a two-day course on how to perform environmentally and statistically sound food sampling for microbial testing, a one-day workshop on best practices for safe and high quality aquaculture products, including a field trip to a shrimp farm (in the dessert!) and a one-day workshop on converting to the NCIMS voluntary HACCP system.

Networking opportunities were abundant throughout the Meeting. On Saturday evening we welcomed new Members and first time attendees. The Affiliate representatives and officers also kicked off the meeting with an educational session and reception.

Standing Committees, Special Committees and Professional Development Groups (PDGs) met througout the day on Sunday. Minutes from these meetings can be found starting on page 872. If you are not currently involved in one of these Committees or PDGs, we encourage your involvement. Contact the Association office to get involved!

Sunday evening attendees were welcomed to the "Grand Canyon State" by the newly chartered affiliate, the Arizona Environmental Health Association (AEHA). A special thanks to David Ludwig, Aimee Upton, Chris Reimus and the entire AEHA crew for their hospitality and assistance throughout the meeting.

The prestigious Ivan Parkin Lecture was delivered by Dr. Martin B. Cole, presently Director at the National Center for Food Safety & Technology at Illinois Institute of Technology. His presentation was titled *Advanced Food Protection Technology* (see page 842). The room was full with over a thousand attentive audience members who then moved across



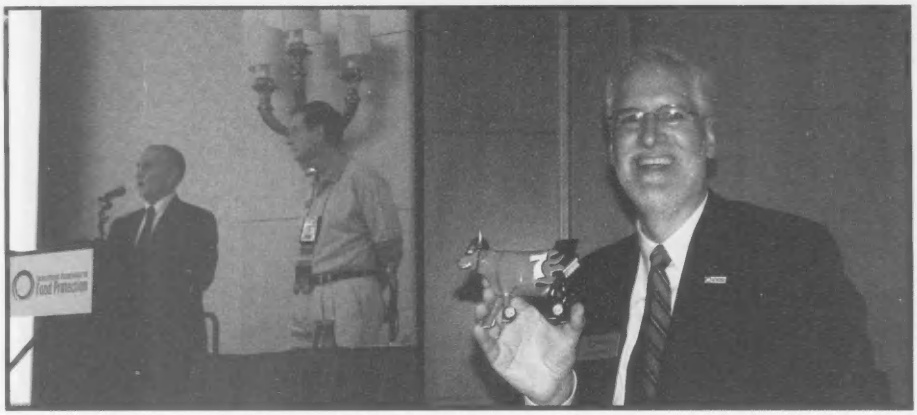
the hall to enjoy the Cheese and Wine reception sponsored by Kraft Foods. It was a night filled with business and pleasure as attendees young and old gathered to enjoy the start of IAFP 2004.

Monday through Wednesday saw attendees rushing from session to session.

Student participation in the Annual Meeting has flourished over the past few years. Once again the students assisted as room monitors for each session, had a booth in the foyer where they sold out of their polo shirts and hosted the job fair. These are our future leaders and we value their assistance.

Topics ranged from *Mycobacterium paratuberculosis* to Sanitary and Hygienic Design, Construction, and Fabrication of Dairy and Food Equipment. See the write-ups on page 849 for a summary of these sessions prepared by the student monitors. Abstracts are also available on the IAFP Web site.

They also held their first Student Mixer which was a huge success! Please encourage students you know to become active in IAFP and stay active as they pursue a career in food safety. They will make life-long friends, increase their knowledge and have fun at the same time!



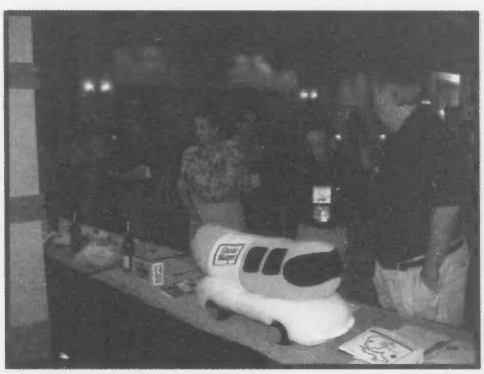
A plenary session was held Tuesday during the lunch break featuring Dr. Merle Pierson, USDA Deputy Under Secretary for Food Safety with a presentation titled *Food Safety Policy at USDA: The Road from an Ambitious Vision to Tangible Results*. See page 846 for a summary of this talk.

This year marked the inaugural John H. Silliker Lecture. A very special thanks goes to John Silliker and Silliker Inc. for making this possible. We were honored to have Dr. Silliker at the meeting to launch this new annual lecture.

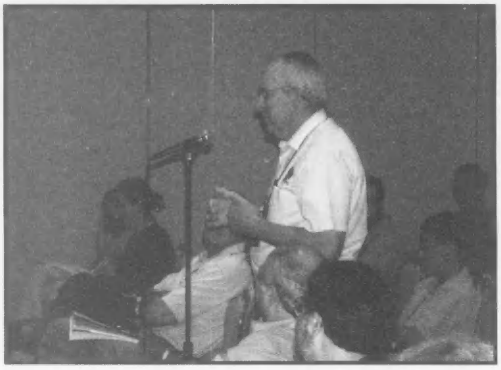
R. Bruce Tompkin, Retired Vice President of Product Safety, ConAgra Refrigerated Foods delivered the lecture, *Guess Who's Come to Stay – The Resident Pathogen Issue* on Tuesday afternoon. A summary of this lecture is on page 844 of this issue.

Tuesday was a very busy day and concluded with the Annual Business Meeting. However, no one was caught snoozing after the Florida Association for Food Protection took the stage! Caught up in the drama of the Olympics in Greece, representatives from Florida dressed in full toga attire as they held a Roma tomato eating contest. The winner graciously presented a check for $1,000 to the IAFP Foundation Fund. Can they top this performance next year? Plan now to be at next year's Business Meeting! Full minutes from the Business Meeting are on page 870.

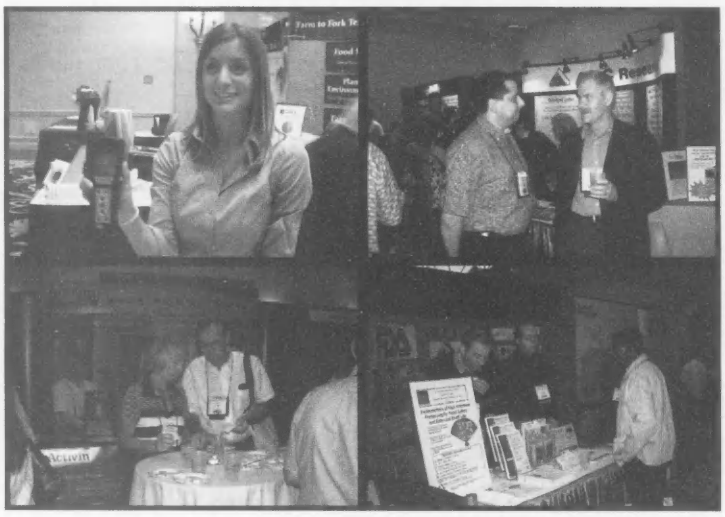
Evenings provided time to take a break from work and enjoy Phoenix and its beautiful surroundings. This year's Monday Evening Social was held at Rawhide Western Town. Attendees were found strolling the streets of the Old West, playing Black Jack in the saloon, riding a covered wagon through the dessert and a few were even caught riding the mechanical bull – no names will be mentioned!



Wednesday evening the meeting concluded with the Awards Banquet. Several deserving Members were honored for their contributions to the field of food safety. Award winners are listed on page 833. While looking through these awards we encourage you to think of other deserving individuals and submit nominations for IAFP 2005 Awards.



The Banquet concluded with Paul Hall passing the gavel to incoming President Kathy Glass. We thank Paul for his leadership during his year as President and welcome Kathy as our new President.



We received several excellent comments in regards to IAFP 2004. A survey was sent to all attendees following the meeting. From this survey 96% of respondents said the conference exceeded or met their expectations. The Program Committee can take great pride in these results. This year's Program Committee was chaired by Gary Acuff. A special thanks to Gary and the committee for putting together an excellent program.

We also want to thank our Exhibitors and Sponsors, see pages 900 through 904. Without their support the meeting would not be what it is today. So please review the Sponsorship and Exhibitor listings and take time to thank these companies if you get a chance. We truly appreciate their support!

Although IAFP 2004 is over, the knowledge gained and the friendships made will last all year. We look forward to seeing everyone at IAFP 2005 in Baltimore, Maryland. Mark your calendars today for August 14–17, 2005!

Photos by Ron Case

2004 Award Winners

Wilbur Feagan (left) presents David Theno from Jack in the Box Inc. the IAFP 2004 Black Pearl Award to Jack in the Box Inc. F & H Equipment Co. and Wilbur Feagan sponsor the award.

BLACK PEARL AWARD

Jack in the Box Inc.
San Diego, California

Each year, the International Association for Food Protection honors a single company with its most prestigious award, "The Black Pearl," in recognition of that company's efforts in advancing food safety and quality through consumer programs, employee relations, educational activities, adherence to standards and support of the goals and objectives of IAFP. The recipient of the 2004 Black Pearl Award is Jack in the Box Inc.

Jack in the Box Inc., based in San Diego, CA, operates or franchises more than 1,970 Jack in the Box restaurants in 17 states. Founded in 1951, Jack in the Box was the first major hamburger chain to develop and expand the concept of drive-thru dining, and the first to introduce menu items that are now staples on most fast-food menus, including a breakfast sandwich and portable salads. Today, Jack in the Box offers a broad selection of distinctive, innovative products, including hamburgers, specialty sandwiches, salads and real ice cream shakes.

In 1994, the company became a leader in food safety when it introduced the restaurant industry's first Hazard Analysis Critical Control Point (HACCP) system. Recognized as one of the most comprehensive food safety systems in the quick-serve industry, the HACCP system at Jack in the Box encompasses farm-to-fork procedures to ensure safe food handling and preparation in every restaurant.

The US Department of Agriculture has praised the Jack in the Box HACCP system as a model for the restaurant industry, and the Center for Science in the Public Interest (CSPI), a Washington, D.C. consumer group, has also recognized Jack in the Box as a leader in food safety and a proponent of higher industry standards.

IAFP President, Paul Hall (left) presents Dan Erickson with the 2004 Honorary Life Membership Award. Dan Erickson accepted the award for Harold Wainess.

HONORARY LIFE MEMBERSHIP AWARD

Mr. Harold Wainess
Highland Park, Illinois

This prestigious honor is awarded to long-time IAFP members for their dedication to the high ideals and objectives of IAFP and for dedicated service to the Association.

Mr. Harold Wainess has been involved in food protection for the past 64 years since he obtained his degree in dairy microbiology from Purdue University. After receiving his degree, he worked for various dairy plants, including Dean Milk where he established their first milk control laboratory. In 1944 Mr. Wainess became a "trouble shooter" for York Corporation and traveled through the USA supervising construction to meet the USPHS Grade A standards.

In Covington, Kentucky, Mr. Wainess established a control laboratory and inaugurated a dairy farm sanitation program. In 1943 Mr. Wainess was commissioned a Lieutenant in the USPHS. He was later transferred to the US Army at Camp Adair, Oregon where he was in charge of the food safety program for 80,000 troops. In 1946, he was assigned to the USPHS Chicago regional office.

Mr. Wainess resigned his commission as Lt. Col. in the USPHS in 1953 to enter private practice as a food protection consultant to many of the world's leading manufacturers of food packaging, food packaging equipment, and dairy and beverage processing establishments. He has published over 400 papers with specialties in food packaging and equipment design. He retired from Wainess and Associates in January 2004.

IAFP President-Elect, Kathy Glass (right) and Ann Marie McNamara, Silliker, Inc. present David Fry with the 2004 Harry Haverland Citation Award. Silliker Inc. sponsors this award.

HARRY HAVERLAND CITATION AWARD

Mr. David D. Fry
Lawrenceville, Georgia

Mr. David Fry is this year's recipient of the Harry Haverland Citation Award for his years of devotion to the ideals and objectives of IAFP.

Mr. David Fry is Canadian born with military service in the 82nd Airborne Division and educated in dairy science at Purdue University. He has over 45 years in quality assurance and dairy plant management experience with positions in Florida with T.G. Lee Foods, McArthur Dairies, Dean Foods, and the Borden Company.

Mr. Fry worked for eight years with Dairy-Tech/Bunge Foods in Atlanta as a technical service representative, traveling the United States, Mexico, Canada, and Central America, working with stabilizers, fruits and flavors in cultured products, frozen desserts and fluid products in over 110 food plants.

In 1954, Mr. Fry became a Member of IAFP and the Florida Affiliate (FAFP), where he served 24 years as the Florida Affiliate representative. In 1986, he became a founding member of the Georgia Association for Food Protection and served as its Affiliate representative for the past 18 years.

In 1995, Mr. Fry was awarded Honorary Life Membership in FAFP and earned the Dr. C. Brinson Lane Memorial Award for Excellence.

Mr. Fry was elected to the IAFP Board of Directors in 1973 and served as President of IAFP in 1978. In 1986 he was presented the IAFP Certificate of Merit Award by the Georgia Affiliate. He was awarded the Harold Barnum Industry Award in 1993 and the IAFP Honorary Life Membership Award in 1998. In 2002 he was awarded the IAFP Fellows Award. Mr. Fry is presently a Member of the IAFP Past Presidents' Committee, vice chairperson of the Constitution and Bylaws Committee and a representative of IAFP as a trustee/secretary-treasurer on the 3-A Symbol Council.

IAFP President-Elect, Kathy Glass (right) and Fritz Buss, Nelson Jameson present Linda Harris with the 2004 Educator Award. Nelson Jameson, Inc. sponsors this award.

EDUCATOR AWARD

Dr. Linda J. Harris
Davis, California

Dr. Linda Harris is this year's recipient of the Educator Award. This award recognizes an IAFP Member for outstanding service to the public, the Association and the arena of education in food safety.

Dr. Linda Harris graduated from the University of Alberta with a B.Sc. in food science. She worked as a dairy microbiologist before completing the M.Sc. degree in food microbiology at the University of Alberta and the Ph.D. in microbiology at North Carolina State University. Dr. Harris taught food microbiology at the University of Guelph before joining the Department of Food Science and Technology at the University of California, Davis in 1996 as a Cooperative Extension Specialist in Microbial Food Safety. In addition to organizing and participating in a wide variety of workshops for producers, processors, retailers, and consumers, she is a highly regarded guest lecturer for many undergraduate and graduate courses.

As an IFT scientific communicator, Dr. Harris is often interviewed by local and national media. Her research has focused on the microbiology of fresh fruits, vegetables and tree nuts. Her work has led to the development of proposed standard microbiological methods for a variety of produce items. She has used these methods to evaluate the behavior of foodborne pathogens on fruits, vegetables and tree nuts and to evaluate various antimicrobial agents for their efficacy in reducing microbial populations on various cut and intact produce surfaces.

Dr. Harris has chaired the *Dairy, Food and Environmental Sanitation* Management Committee and was a founding co-chair of the Fruit and Vegetable Safety and Quality Professional Development Group. She has served on the editorial boards of the *Journal of Food Protection* and *Applied and Environmental Microbiology* and has published over 55 scientific and extension publications.

IAFP Vice President, Jeffrey Farber (left) and Peter Bodnaruk, Ecolab Inc., present Helen Piotter with the 2004 Sanitarian Award. Ecolab, Inc., Food and Beverage Division sponsors this award.

SANITARIAN AWARD

Ms. Helen M. Piotter
Macy, Indiana

Ms. Helen Piotter graduated from Purdue University School of Agriculture, with a BS in agriculture/animal science in 1980. Her employment started with the Indiana State Department of Health Dairy Division as a dairy farm sanitarian, and in 1993 she was promoted to state milk rating officer.

Ms. Piotter's activities include serving on the 3-A Sanitary Standards Committee on Sanitary Procedures as vice-chair; the Atlantic-Midwest Dairy Equipment Review Committee as chair; National Sanitation Foundation's Council for Public Health Consultants for a three-year term; Hauling Procedures Committee through the National Conference on Interstate Milk Shipments, and the 3-A Sanitary Standards Variance Review Committee. She has also served on International Association for Food Protection Committees, including the Sanitarian Awards Committee, Dairy Quality and Safety Professional Development Group, and the Editorial Board of *Food Protection Trends*.

Ms. Piotter's other interests include being a member of several music groups through her church including a strings group, choir and folk group. She is vice president of the North Miami Music Parents' Association, a member of the Peru City Circus Band with her children, and a member of the Nidee Guild Chapter of the Logansport Mizpah Shrine Club.

IAFP Secretary, Frank Yiannas (right) and Fred Weber, Weber Scientific, present Kathleen Rajkowski with the 2004 Maurice Weber Laboratorian Award. Weber Scientific sponsors this award.

MAURICE WEBER LABORATORIAN AWARD

Dr. Kathleen T. Rajkowski
Wyndmoor, Pennsylvania

Dr. Kathleen Rajkowski is this year's recipient of the Maurice Weber Laboratorian Award. This award recognizes Dr. Rajkowski for her outstanding contributions in the laboratory and her commitment in the development of innovative and practical analytical approaches to support food safety.

Dr. Kathleen Rajkowski received a B.S. in home economics from New York University, an M.S. in food science from the Connecticut University and a Ph.D. in food science from the Ohio State University. Prior to joining the USDA, Dr. Rajkowski worked for both the Food and Drug Administration in Cincinnati, OH and the US Customs Laboratory in New York City. Since 1991 she has been a Research Microbiologist at the Eastern Regional Research Center in Wyndmoor, Pennsylvania.

Dr. Rajkowski's research has focused on pathogen reduction using the process of irradiation on seeds, sprouts and cut vegetables, concentrating primarily on the elimination or control of *Salmonella*, *Shigella,* and *Escherichia coli* O157:H7. Her other research areas of study were with pathogens under stress in a water environment when nutrients are limited and the removal of pathogens from hog transportation vehicles using various sanitizers and washing protocols.

Dr. Rajkowski is the vice-chair of the Water Safety and Quality PDG and a member of the Fruit and Vegetable Safety and Quality PDG, and was a member of the Developing Scientist Awards Committee. She serves on the editorial boards of *Journal of Food Protection*, *Food Protection Trends* and *Journal of Food Science*. Dr. Rajkowski is a member of the planning committee for the Eastern Food Science Conference XIV (2005) and was chair of the Student Competition for the 2003 EFSC XIII. She is the regional representative to the Organization of Professional Employees of the USDA. Dr. Rajkowski is also a member of Association for Women in Science, American Society for Microbiology, IFT, Microscopy Society of America and the International Water Association.

IAFP President, Paul Hall (left) and Leon Gorris, Unilever, present Martin Cole with the 2004 International Leadership Award. Unilever, Safety and Environmental Assurance Centre sponsors this award.

INTERNATIONAL LEADERSHIP AWARD

Dr. Martin B. Cole
North Ryde, New South Wales, Australia

Dr. Martin Cole is this year's recipient of the International Leadership Award. This award is presented to Dr. Cole for his dedication to the high ideals and objectives of IAFP and for promotion of the mission of the Association in countries outside of the United States and Canada.

Dr. Martin Cole is the Deputy Chief Executive of Food Science Australia and Chairman of the International Commission for the Microbiological Specifications of Foods (ICMSF). Dr. Cole has held a number of senior positions within the food industry including Head of Microbiology for Unilever located in UK and the Netherlands as well as Group Director Food Safety, Microbiology & Chemistry for Nabisco in the USA. He has published and presented over 80 papers on many aspects of food microbiology including predictive modelling, risk assessment and food preservation technology.

Dr. Cole has over 10 years experience within the CODEX Food Hygiene Committee where he has been a member of a number of different country delegations including the United States and more recently Australia. He is frequently asked to be a contributing expert to national and international consultations on a wide range of food safety issues. Within Australia, Dr. Cole is the Co-Director of the Australian Food Safety Centre of Excellence, a Fellow of Food Standards Australia and New Zealand (FSANZ) as well a Visiting Research Professor at the University of Tasmania. Internationally, he is the Chairman of the International Commission for the Microbiological Specifications of Foods (ICMSF), a member of the Editorial Board of Innovative Food Science & Emerging Technologies and a member of the Editorial Advisory Board for *Food Safety Magazine*.

IAFP President Paul Hall (left) presents Reginald Bennett with the 2004 President's Lifetime Achievement Award.

PRESIDENT'S RECOGNITION AWARD

Reginald W. Bennett
College Park, Maryland

Paul A. Hall, President of IAFP, is pleased to announce that Mr. Reginald W. Bennett is the recipient of the 2004 President's Recognition Award. This award is in recognition of Mr. Bennett's lifetime commitment to personifying the ideals of IAFP. Mr. Bennett's lifetime professional achievements have made a lasting impact on "Advancing Food Safety Worldwide." He is a world-renowned expert on *Staphylococcus aureus* and *Bacillus cereus* enterotoxins whose exemplary career as a microbiologist spans nearly half a century.

A graduate of the University of Pittsburgh, with a masters of science degree in microbiology, Mr. Bennett began his career at hospitals in Pittsburgh and Braddock, Pennsylvania, and served as an assistant professor of microbiology at Benedict University in Columbia, South Carolina. In 1960, Mr. Bennett went to work for the US Food and Drug Administration in Washington, D.C., and began a 44-year research career with primary emphasis on bacterial foodborne illness and laboratory diagnosis. Today, Mr. Bennett is the Acting Chief of the Microbiology Methods Development Branch, Division of Microbiological Studies, Office of Special Research Skills, Center for Food Safety and Applied Nutrition, and an Adjunct Professor at Howard University in Washington, D.C. Mr. Bennett has published over 150 publications including research papers and abstracts, method manuals, book chapters, review papers, and trade magazine articles and lectured at hundreds of workshops and conferences around the world on advances in food pathogen detection methodology and *Staphylococcal* and *Bacillus* enterotoxins.

Mr. Bennett has received many awards during his career, including FDA's Excellence in Science Award, Quality Performance Award, Special Accomplishment Award, and Special Recognition Award, the Public Health Service's Superior Service Award, and the Department of Health and Human Services' Secretary's Award for Distinguished Service (for leadership in FDA's counterterrorism/bioterrorism preparedness). During his three decades of participation in IAFP Mr. Bennett has attended annual meetings and given numerous presentations, served on the editorial board of the *Journal of Food Protection*, and published many articles in the association's journals.

Craig Henry, National Food Processors Association presents Anne Munoz-Furlong from The Food Allergy & Anaphylaxis Network with the 2004 NFPA Food Safety Award. The National Food Processors Association sponsors this award.

NFPA FOOD SAFETY AWARD

The Food Allergy & Anaphylaxis Network
Fairfax, Virginia

The Food Allergy & Anaphylaxis Network is this year's recipient of the National Food Processor's (NFPA) Food Safety Award for their

outstanding contribution to food safety research and education. Founded in 1991 by Anne Munoz-Furlong, The Food Allergy & Anaphylaxis Network (FAAN) is the world's largest nonprofit organization providing information about food allergy to those affected by food allergy, the media, schools, health professionals, pharmaceutical companies, the food industry, and government officials. Ms. Munoz-Furlong established the organization because of the lack of information available when her own daughter was diagnosed with milk and egg allergy as an infant.

FAAN's mission is to raise public awareness, to provide advocacy and education, and to advance research on behalf of all those affected by food allergies and anaphylaxis. Membership includes more than 26,000 members in the United States, Canada, and 63 other countries. They include people who have food allergy, parents of children who have food allergies, school officials, and medical and food industry professionals.

Educational materials published by FAAN are reviewed for medical accuracy by the FAAN Medical Advisory Board, which is comprised of 12 leaders in food allergy science and medicine. Annual programs include Food Allergy Awareness Week, Food Allergy Conferences, Mariel C. Furlong Awards for Making a Difference, *Food Allergy News for Kids* Poster Contest, and College Scholarship Essay Contest.

The Food Allergy & Anaphylaxis Alliance (FAAA) was established in 1999 by FAAN to facilitate information sharing among non-profit organizations working in the field of food allergy around the world. In addition to FAAN, FAAA comprises representatives from the United Kingdom, Canada, Australia, New Zealand, The Netherlands, and Japan.

DEVELOPING SCIENTIST AWARDS

Developing Scientist Award Winners: (left to right) Kaye Sy, Keith Vorst, Wei Zhang, Catherine Donnelly, Chairperson, Katija Blaine, and Yohan Yoon.

ORAL

1st — Wei Zhang
2nd — Katija Blaine
3rd — Keith Vorst

POSTER

1st — Kaye Sy
2nd — Yohan Yoon
3rd — Dennis Allen

Affiliate Award Winners: Steven Murphy presents Affiliate awards to Metropolitan Association for Food Protection, Fred Weber (left to right), Marjorie Jones, Florida Association for Food Protection; Steve Murphy, Tom Graham, Ontario Food Protection Association; Terry Peters, British Columbia Association for Food Protection; and Bob Gravani, New York State Association for Food Protection.

IAFP President, Paul Hall (right) presents David Ludwig of the Arizona Environmental Health Association with an Affiliate Charter.

AFFILIATE AWARDS

AFFILIATE MEMBERSHIP ACHIEVEMENT

British Columbia Food Protection Association

BEST AFFILIATE COMMUNICATION MATERIALS

New York State Association for Food Protection

BEST AFFILIATE EDUCATIONAL CONFERENCE

Metropolitan Association for Food Protection

BEST AFFILIATE ANNUAL MEETING

Florida Association for Food Protection

C. B. SHOGREN MEMORIAL

Ontario Food Protection Association

Jack in the Box Inc.

IAFP 2004 Black Pearl Award Winner

San Diego, California, USA

Jack in the Box Inc., the nation's first major drive-thru hamburger chain, operates and franchises more than 1,959 Jack in the Box (JIB) and more than 130 Qdoba Mexican Grill restaurants in 32 states. Headquartered in San Diego, the company has more than 45,000 employees.

A 1993 *E. coli* O157:H7 outbreak at Jack in the Box not only changed the way JIB does business but changed the scope of research worldwide and the way the USDA evaluates products. This significant change in research and evaluation brought Jack in the Box from the brink of destruction to the forefront of food safety.

The Jack in the Box Web site (www.jackinthebox.com) devotes a section to *Food Safety* and provides information on its HACCP and food safety programs. The Web site also allows guests to communicate via E-mail with any questions or concerns they have. All comments/questions from the Internet are answered within 48 hours by E-mail, letter, or direct call as necessary to ensure that guest satisfaction is achieved.

As an employer, JIB provides an environment that fosters personal and professional growth. As a restaurant chain, JIB offers a diverse menu of burgers, sandwiches, and salads that guests know are freshly made, delicious and safe to eat. As a business, JIB adheres to the highest standards of professional conduct and best practices, which contributes to higher levels of safety and productivity. And as a good neighbor, JIB strengthens its restaurant communities by supporting and implementing a variety of local, regional and system-wide initiatives.

In 1993, JIB developed and implemented a production-to-consumption HACCP-based food safety system that is considered the gold standard for food-service companies. To further help ensure that products and procedures are designed to minimize food safety risks in the restaurants, JIB suppliers must also maintain HACCP systems and process–improvement programs.

All processing plants and distribution centers are monitored at least yearly through JIB or third-party audits. The plant audits are comprehensive and cover food safety programs, facility exterior and interior, receiving and storage of raw materials, product processing, storing and shipping, control of non-conforming product, sanitation and Good Manufacturing Practices, product evaluation and reporting systems, and continuous process improvements. Quality assurance monitors vendor HACCP programs, recall programs and shift production records. There is a hold and release program for all protein products used in restaurants. Ingredient shipments are temperature monitored. A risk-based microbiological, chemical and physical sampling program checks incoming finished product and there is an hourly handwashing and sanitizing program for employees as part of the restaurant-managed HACCP system.

JIB has the most aggressive ground beef microbiological-surveillance program in the industry, involving strict sampling protocol for beef raw materials and 15-minute lot sampling. There are internal and external programs to measure food quality, cleanliness, guest service and food-safety execution.

Equipment used in restaurants includes extra handwash sinks and sanitizer stations in all new and remodeled restaurants. Smallwares all meet NSF standards. The

corporate office systems monitor refrigerators and freezers in restaurants hourly. Special JIB-developed towels are used to control the correct sanitizer concentration, and automated, air-gapped, chemical-dispensing units are utilized for strength consistency.

Food safety training at all levels is key to consistent execution of JIB programs. In restaurants, a new interactive system of computer-based training (CBT) will replace each restaurant's library of videotapes with a touch-screen computer terminal. Incorporating audio, video, animation and text — all of which are updated on the computer via satellite technology — CBT is designed to cultivate happier, better-trained employees while minimizing individual time commitments for restaurant managers. The CBT terminals will be installed in all company restaurants by the end of 2004. CBT will be the standard for new-hire, management, new product training programs, and workstation re-certifications. In addition to JIB training, all regional vice presidents, area managers, restaurant managers, assistant managers, and shift leaders must be certified through the ServSafe® training program. All people working in the corporate office who deal with restaurants have also achieved certification through the ServSafe® Program that has achieved national accreditation by the American National Standards Institute (ANSI).

As an example of a firmly held belief that food safety knowledge serves everyone, JIB freely shares its proprietary food safety programs, forms, preferred supplier criteria, distribution systems, and microbiology testing protocols with competitors, the regulatory community, and all others who wish to learn from them. The company has also actively supported state and national initiatives such as:

- participation on the National Cattlemen's Beef Association 2003 Food Safety Summit and Exposition;
- California Uniform Retail Food Facilities Law (CURFFL) requiring mandatory minimum cooking temperatures;
- mandatory reporting of illnesses associated with *E. coli* O157:H7;
- adoption of the 1997/1999 FDA Model Food Code by all states; and
- participation on The National Advisory Committee on Microbiological Criteria for Foods.

For more than 10 years, suppliers for Jack in the Box have never had a recall, and JIB remains an industry leader at a time of heightened food safety concerns. A system that was viewed as revolutionary a decade ago remains among the strongest food safety controls in food processing. JIB understands far more than most how tragic a foodborne illness outbreak can be. The company's ability to identify invisible killers continues to improve through the painstaking work of research physicians, geneticists, virologists, epidemiologists, and sanitarians. JIB strives to prevent foodborne outbreaks form occurring by continuing to develop and implement interventions at every link of the food supply chain, from production facilities to JIB restaurants and they are proud to help prevent such outbreaks form occurring elsewhere by freely sharing their knowledge with others.

Ivan Parkin Lecture

Presented by
Martin B. Cole, Ph.D.
Director, National Center for Food Safety and Technology
Illinois Institute of Technology
Summit-Argo, Illinois

"Advanced Food Protection Technology"

It has been said that in times of change, learners inherit the earth, while the learned will find themselves beautifully equipped to deal with a world that no longer exists. In the case of microorganisms, their ability to learn, or adapt, to a changing world has certainly been a key factor in the emergence of new foodborne pathogens that were not of concern even a decade or so ago.

The rapid globalization of the food processing and retailing industries, consumer demand for more natural and more convenient products and an overall increase in the susceptibility of the population are believed to be the most important factors that have led to fundamental changes in the nature of foodborne disease itself. The primary consumer trends within the mature food markets have been toward products perceived as offering pleasure, health and convenience benefits. Consumers in these markets are increasingly time-poor and may lack cooking skills, but they desire a wide range of sensory experiences. Mature markets often also have a preoccupation with health and well-being, especially in the relatively wealthy "baby boomer" market. Research and business opportunities will arise as food processing companies move to meet consumer wishes for health promoting, convenient and pleasurable foods, with premiums arising through combinations of these desirable attributes (e.g., healthy "functional foods" in a convenient form). Within this environment, the food industry has been plagued by on going food safety issues and dietary concerns that include bacterial pathogens, BSE, chemical contaminants, allergens and obesity. Food safety is a recognized given in the marketplace yet consumer trends towards fresher, more natural, less preserved convenient foods are not always conducive to enhanced food safety as many traditional preservatives are also intrinsic stability or food safety factors. In addition to the traditional food safety threats, the events of September 11 have led to the recognition of the potential for intentional introduction of contaminants into the food supply. As a result of these drivers and increasing food safety issues, industry, government and academia have responded by advancing the science and technology of food protection.

The primary role of a national government in food safety management is to protect the safety of its consumers and then secondly to facilitate trade. Industry also obviously has a prime interest in issues of real public health significance but also has to manage perceived risks. In industry, both real and perceived risks can represent a significant business risk. As new food safety issues emerge it is important to quickly try to distinguish those risks that represent a real public health risk and to design and implement appropriate control measures and risk communication strategies. Given the complexity of many of the emerging issues of food safety an effective response increasingly requires an active network between academia, government and industry.

Advances in the tools for studying single cell responses and microbial genomics are bringing a new level of understanding of the behavior of microbial foodborne pathogens. Understanding of the underlying biovariability of microbial populations led Bridson

and Gould (2000) to compare these advances to those that took place in physics describing the change as going from "Newtonian Microbiology" to "Quantum Microbiology." This new appreciation is starting to influence the way we interpret microbial kinetic data. For example, first order or log-linear death kinetics and the use of D and Z values remain the cornerstone of thermal processing within the food industry today yet deviations from the straight line approach are often observed in practice. An appreciation of the underlying biovariability within a microbial population has led to the development of new models based on a distribution of sensitivity that will allow more accurate processing to be developed and more precisely controlled. This underlying biovariability is, in fact, present in all biological populations and is crucial for selection and survival in a changing world. Consider the survival chances of a population of spores that all germinate at the same time only to find that the environment that they were in was no longer able to support growth at that moment. Darwin described the survival of any life form as requiring a "delicate balance between fidelity of replication and intergeneration variation."

Advances in microbial genomics, proteomics, metabolomics are being channeled into bioinformatic networks to bring a new systems biology approach to food safety. Through the integration of statistical analysis, databases, pattern recognition and whole cellsimulations, these networks hold the promise for the development of new preservation and intervention strategies and improved detection of microorganisms in complex matrices. Increasingly, the systems biology approach will influence food safety management strategies introducing a new dimension to the validation of new food safety control measures, risk assessment procedures, and regulation.

Developments in the areas of predictive modelling and risk assessment now offer the potential to link exposure to a microbial hazard to the likely number of cases of illness in the population and are leading to nothing less than a paradigm shift in the way that food safety risks are managed internationally based on the new concept of Food Safety Objectives (FSOs). This new framework will facilitate the transparent communication of food safety responsibilities of different stakeholders across the food chain and form the basis of equivalency of different food safety control measures. The flexibility of this approach will be a key aspect for companies wishing to innovate in this area. A good example here is the discovery and development of improved preservation processes with minimal impact on the fresh taste, texture and nutritional value of food products. Among the most innovative of these technologies are the non-thermal technologies, High Pressure Processing (HPP), Ultrasonics, Ultraviolet Light, and Pulsed Electric Field (PEF). Application of emerging technologies with a focus on the safety, freshness and diversification of food products to meet the consumers' desire for safe, convenient, healthy and high quality foods is expected to create the basis for significant advances in the food arena.

Developments in food science therefore offer exciting new possibilities to meet the consumer drivers of health, convenience, pleasure and environment. In delivering these possibilities it is important that we do not introduce new food safety hazards. Food protection technology will therefore play a crucial role in trying to predict and prevent new concerns as well allowing us to respond quickly and effectively to emerging threats. This will require not only the use of the technologies described but also an intricate networking and collaboration among all stakeholders involved.

John H. Silliker Lecture

Presented by
R. Bruce Tompkin, Ph.D.
Retired Vice President, Product Safety
ConAgra Refrigerated Prepared Foods

"Guess Who's Come to Stay — The Resident Pathogen Issue"

The dictionary defines resident as "living in a place for a length of time." Hearing this particular word may take some of you to an unpleasant psychological place when a never-do-well relative turned a one-week stay in your home into an interminable holiday. While it is somewhat difficult to draw a fitting analogy between never-do-well relatives and resident pathogens that thrive in food processing environments, proactive actions and effective strategies are needed to address both of these unwelcome "entities."

By in large, microorganisms can be divided into two distinct groups: transient and resident. Transient microorganisms are often introduced into the food environment through raw ingredients, equipment, water, employees, and other routes. Generally, the routine application of good sanitation practices is adequate to remove or kill "transients" during cleaning and disinfection. In some cases, however, certain transients can become established, multiply, and assume "residency" in harborages (e.g., hollow rollers and supports for conveyors, metal-to-metal surfaces, electrical boxes that are not watertight).

Listeria monocytogenes, a major pathogen that is responsible for an estimated 2,493 cases of listeriosis in the United States each year *(1)*, often serves as the face of this phenomenon. A number of studies have shown that certain strains of *L. monocytogenes* can become established in processing plants and remain members of the residential microflora for months or years *(1)*. Salmonellae also have a long history of becoming residents in food operations.

Against this disquieting backdrop, processors must make the plant environment as inhospitable as possible for *Listeria*, salmonellae, and other potentially harmful microorganisms. The following sections encapsulate a three-prong, scientific approach to achieve this objective in food operations where resident pathogens can lead to contaminated food.

Prevention First

Preventing conditions that lead to the creation of harborages is imperative for processors. This begins with selecting equipment designed for cleanability and then applying an effective preventive maintenance program that includes scheduled replacement or repair of equipment before it becomes a source of contamination. Equipment should be inspected periodically for parts that are cracked, worn, or have developed spaces where food and moisture can accumulate. In some cases plant management should replace hard-to-clean equipment.

Cleaning and disinfection regimens should be tailored to control of pathogens, particularly where ready-to-eat foods are exposed.

Environmental Sampling Programs

Processors of ready-to-eat foods should employ environmental sampling programs to monitor for the pathogens of concern in their specific food operation.

A well-designed environmental sampling program helps to detect unacceptable

microbiological contamination in a timely manner. Saying this, a positive result should be viewed as a success and not a failure. The worst possible scenario is one in which a sampling program is incapable of detecting contamination, falsely leading management to believe the environment is in control.

An example of a sampling program could involve collecting samples during production on a weekly basis from established sites. The day of the week and time of sample collection are randomized to reflect different conditions that occur during production. The sampling sites are based on experience and previous successes in detecting contamination and solving problems. The majority of samples could consist of sponge samples from selected surfaces (e.g., product contact, floors, support structures) but the samples should be whatever will be most productive for the type of food operation *(2)*.

The number of samples varies with the complexity of the process and the food being produced. Sample site selection can best be resolved by answering the following question. If available funds can allow only a certain number of samples (e.g., 5, 10, 20) each week, which sites would yield the best assessment of control and detect the potential for product contamination? When a facility has a favorable record of control it may be possible to composite certain samples and reduce analytical costs.

Data Collection and Analysis

Tabulating results at frequent intervals (e.g., weekly) provides processors with a short-term assessment of environmental control. Ideally, the report should include results from previous samplings, allowing trends and patterns to be observed. Lastly, plant management should review quarterly or annual reports for low level, intermittent contamination that may otherwise go unnoticed.

Summary and Conclusion

For years, processors have relied heavily on visual inspection and indicator testing to assess cleanliness in the plant environment. Growing industry awareness that resident pathogens can persist over extended periods in the processing environment has placed an increased onus on processors to measure the effectiveness of their pathogen control efforts.

Stringent in-plant preventive protocols, environmental sampling programs, and data collection arm processors with valuable information to detect and eliminate microorganisms, minimize foodborne illness, avoid costly recalls and produce safer, quality products.

REFERENCES

1. Tompkin, R. B. 2002. Control of *Listeria monocytogenes* in the food processing environment. J. Food Prot. 65:709–725.
2. Tompkin, R. B. 2004. Environmental sampling: A tool to verify the effectiveness of preventive hygiene measures. Mitt. Lebensm. Hyg. 95:45–51.

Plenary Session

Presented by
Merle D. Pierson, Ph.D.
Deputy Under Secretary for Food Safety
United States Department of Agriculture

"Food Safety Policy at USDA: The Road from an Ambitious Vision to Tangible Results"

Significant food safety advancements have been made in the past year. One of these improvements is in implementation and verification of plant Sanitation Standard Operating Procedures (SSOP) and Hazard Analysis Critical Control Point (HACCP) plans, which have led to a dramatic decline in the number of meat and poultry product recalls during 2003. The number of Class I, or high risk, recalls in 2003 have been nearly cut in half from the total observed in 2002. In the first half of 2004, the number of Class I recalls decreased even further to 16. This is a strong indicator that the agency's scientifically based policies and programs are working to prevent adulterated product from entering the marketplace.

More importantly, the accomplishments of our initiatives can be observed in the annual (2004) report on the incidence of infections from foodborne illness by the Centers for Disease Control and Prevention (CDC). The report noted significant declines from 1996 to 2003 in illnesses caused by *E. coli* O157:H7 (42%), *Salmonella* (17%), *Campylobacter* (28%), and *Yersinia* (49%). Illnesses caused by *Salmonella* Typhimurium (typically associated with meat and poultry) decreased by 38%. Between 2002 and 2003, illnesses caused by *E. coli* O157:H7, typically associated with ground beef, dropped by 36%. This reduction in *E. coli* O157:H7 illnesses brings the US closer to achieving the "Healthy People 2010" goal of 1.0 case per 100,000 people.

CDC attributes the changes in the incidence of these infections to control measures implemented by government agencies and the food industry, and enhanced food safety education efforts. Specifically with regard to *E. coli* O157:H7, CDC attributes the reduction in illness caused by this pathogen to policies implemented in 2002 and 2003 by FSIS.

While these results are positive, eliminating foodborne illness is an evolving challenge. Through analysis and discussions with the scientific community, public health experts, and all interested parties, issues have been identified that need to be addressed to attain the next level of public health protection. A brief description of these challenges is also presented. The resulting strategies should help FSIS pursue its goals and achieve its mission of reducing foodborne illness.

The first challenge is the need to anticipate/predict risk through enhanced data integration. FSIS is engaged in developing innovative ways to anticipate hazards, so that it can act to ensure that those hazards do not manifest themselves as public health problems. One significant way in which this can be accomplished is by thoroughly analyzing data obtained from FSIS' regulatory sampling, as well as other sources of data, so as to discern trends and identify connections between persistence, prevalence and other factors, such as plant practices, seasonal variations, and establishment size.

The second challenge is the need for improved application of risk into regulatory and enforcement activities. Food safety problems need to be documented as they occur, so that conditions may be analyzed and, if need be, corrected as

appropriate. A better understanding of the prevalence and types of food safety failures could allow better assessment of how to best address them. Data regarding the causes of food safety violations, either within a specific establishment or within a class of establishments, can be utilized in order to better focus our attention where the risks are greatest. In addition, it can provide us with a tool to determine enforcement trends by district and by circuit, which supervisors can use to determine whether enforcement actions are being consistently applied.

The third challenge is the need for improved association of program outcomes to public health surveillance data. We have seen notable advances in preventing foodborne illness, which CDC has attributed in part to the implementation of HACCP. However, there still is a need to determine how specific policies affect public health. Data that links foodborne illness outbreaks with specific foods needs to be connected with prevalence data of specific pathogens in specific foods. To complete the linkage with public health outcomes, a strong connection with human health surveillance data is needed. FSIS, together with our partners in public health, are working to accomplish this through FoodNet.

The fourth challenge is improving food safety beyond our borders. Food safety is an issue of global importance. As such, it needs to be recognized that FSIS' efforts transcend US borders, and paying special attention to this reality can help guide the agency's fulfillment of its vision for food safety. With the proliferation of movement of people, food, and agricultural products between countries, the likelihood of food that is produced in one country and then being consumed on the dinner table in another is increasing. The acceleration and expansion of this process is evidenced and hastened by the multitude of regional, bilateral, and multilateral trade relationships being pursued and established among countries. With this trend, FSIS has emerged not only as an established leader in effective food safety standards and regulations for the US, but also as the vanguard entity responsible for enhanced food safety on a global scale.

By focusing on these initiatives FSIS will further advance food safety in the US and abroad. For more information, please read *Fulfilling the Vision: Updates and Initiatives in Protecting Public Health* available on the FSIS Web site at www.fsis.usda.gov.

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Session Summaries

Members of the IAFP Student Professional Development Group assisted the convenors by serving as Session Monitors at IAFP 2004. Student Monitors prepared the following session summaries for presentation in *Food Protection Trends*.

S01 — Molecular Subtyping of Foodborne Pathogens

Lynette Johnston and Kelly Stevens
North Carolina State University

This symposium provided an overview of current high-tech molecular subtyping methods for foodborne pathogens, as well as their application for foodborne disease epidemiology and outbreak detection. The role of PulseNet is an improved system for the detection and early identification of the pathogen source and its assistance in providing subsequent intervention strategies has been noted. PulseNet International has also proven to be an effective tool for emerging foodborne disease and bioterrorism threats at a global level. The next frontier includes the partnership with animal health and veterinary groups. The use of Pulsed Field Gel Electrophoresis has proven to be a successful tool for PulseNet. However, next generation subtyping methods are being developed with higher discrimination power, enhanced portability, and increased automation capabilities. Two methods which were focused on during the symposium included Multilocus Sequence Typing and Multilocus Analysis. Overall, the future improvement of molecular subtyping depends upon its ability to be better, faster, and cheaper. Furthermore, analysis of data will require sound knowledge of molecular evolution and population genetics. While molecular methods will continue to improve, flexible data exchange among labs is significant for the overall enhancement of public health.

S02 — Retail Food Safety Risks

Brooke Whitney, Virginia Tech and Lynn Riggins, Kansas State University

Mary Weaver, from NSF International, and substituting for David Abney, discussed the development of an auditing method, looking at the entire process rather than just an end point and using open questions rather than direct questions to focus audits on risks not a score. Auditors need to understand operations, not just food safety. Internal risk control programs were discussed using the how, what, when, where, and who scenario. Challenges included auditor training and qualification, food safety and investigation skills, process development, and auditor flexibility in investigation.

Catherine Cutter, Pennsylvania State University, discussed two surveys and their findings on *Listeria monocytogenes* at the retail level. Examples of *L. monocytogenes* sources included food, ingredients, packaging materials, non-food contact surfaces, food contact surfaces, and people. Conditions for spreading *L. monocytogenes* included cross-contamination, improper time/temperature controls, improper sanitation of food and non-food contact surfaces, and the environment. Many preventative actions were given to reduce *L. monocytogenes* in the environment.

Vincent Radke, CDC, discussed an outbreak/non-outbreak study by EHS-Net on antecedents to foodborne illness in partnership with FDA, USDA, CDC and 8 states. Sample selection methods and study instrument design were discussed. Fifty-two percent of all restaurants surveyed were required to have a certified food safety manager. Forty-seven percent of the outbreak establishments had certified kitchen managers compared to 69% of non-outbreak restaurants. The majority of the outbreaks reported were from viral sources, the most common illness being caused by calieivirus; contamination was the most prevalent factor.

Wayne Derstine, Conference for Food Protection, discussed recommendations made by the various committees and councils to the FDA for inclusion into the 2005 Food Code. Recommendations included revising guidance documents for mobile food units and pushcarts; interdisciplinary training programs and certification for food safety regulatory professionals; revision of standards to include food security/food terrorism, preparedness, and response. Date marking and employee heath interventions were also discussed.

John Marcello, FDA, discussed an on-going study which assesses the risk factors in foodservices that influence the occurrence of foodborne illness. This report will be available in October 2005. Preliminary results indicate emphasis is needed in industry on active managerial control to change behaviors. Priorities include improper hold times/temperatures, poor personal hygiene, and contaminated equipment. The study is broken down into 9 facility types and each should be considered separately.

Peter Snyder, Hospitality Institute of Technology and Management discussed developing food safety programs in restaurants using the systems approach, similar to those in food processing facilities. Using this method makes the recipe the key document as it would explain the steps taken, critical limits, corrective actions, and serve as the processes control document. Monthly HACCP team meetings would be held to address any problems. The person most responsible for making sure all processes and records are completed correctly would be the head chef/cook. This method would reduce the burden on inspection personnel.

S03 — Validation and Verification of Pathogen Interventions in Meat and Poultry Processing

Leslie K. Thompson, Kansas State University and Laura Bauermeister, Auburn University

Verification is defined as those activities, other than monitoring, that determine the validity of the HACCP plan and that the system is operating according to the plan. Validation is a part of verification and is defined as the element of verification focused on collecting and evaluating scientific and technical information to determine if the HACCP plan, when properly implemented, will effectively control the hazards. Gary Acuff began the session by discussing the validation of carcass interventions. The best strategy for validating carcass interventions is to focus on critical control points rather than end product testing. Available options for testing are a presence/absence test for the hazard, detection of traditional indicator organisms, or inoculation studies. The ideal indicator organism should have similar heat/acid resistance, similar growth pattern as the pathogen of concern. They also need to be nonpathogenic and easy to detect or enumerate. The absence of an indicator does not necessarily mean that the critical point is controlled. Todd McAloon discussed the validation of chilling processes. The goal of chilling is to minimize the growth of pathogens of public health significance. The process followed for prevention of outgrowth in a product is usually determined by review of published literature, computer modeling, and plant data collection. Computer modeling allows for the creation of "what if" situations. It also allows for a decrease in testing required. The computer models have been improved to be more user-friendly and must be validated in real-life to make sure that the model is not too conservative.

Ann Marie McNamara discussed initial and continued verification and data collection. The initial validation of the HACCP plan helps to determine if the plan is able to control hazards. It helps to determine if the correct critical control points are chosen and where to set critical limits. Verifying CCPs involves evaluating the day-to-day compliance of activities and calibrating processing/monitoring instruments. The frequency of verification may determine amount of product potential affected in a recall. Reassessment of the HACCP plan is necessary to determine adequacy or control hazards.

Warren Dorsa discussed the validation of cooling process for ready-to-eat meat products. The USDA has specific regulations for cooling of product following heat-treatment to prevent the outgrowth of *Clostridium botulinum*. There is the option for a company to develop their own cooling protocol. The products for which the cooling regime is being developed can and should be grouped so that not every product has to be validated. The groupings should be based on meat type (species), meat density (emulsified, chunked, etc.), and anti-microbials/inhibitors in formulation.

Daniel Engeljohn discussed the regulatory perspective on validation and verification activities. Portions of the food industries' food systems are poorly supported with relevant data specific to the establishment. Recently, the FSIS has started to perform critical assessments of food safety systems. In the coming years, there will be an increase in attention to supporting documentation and specific data, both historical and current, will be necessary to demonstrate that the food safety system is working correctly. This will demonstrate ongoing effectiveness of the control methods, supporting decisions for setting methods and frequency of monitoring/verification in the establishment.

S04 – Extending the Shelf Life of Fluid Dairy Products

Kristen Matak, Virginia Tech and Stephan Flessa, University of California-Davis

The purpose of this symposium was to address the risk factors that are introduced when the shelf life of milk is extended from 10 to 16 days to over

20 days. The shelf life of a product has been defined as "the period of time that a product can be kept under typical and normal conditions." Steven Murphy of Cornell University discussed types of tests for quality evaluation of milk from the farm to the table and other factors that influence shelf life. The shelf life of milk is influenced by the quality of the raw milk. High initial bacterial counts, somatic cell counts have an effect on shelf life. Enzymatic activity and post-pasteurization contamination also have an effect. Ultimately, it is the effect that these quality issues have on sensory properties that determine shelf life.

David Blomquist from Ecolab stated that the dairy industry is facing strong competition from other industries and this is the driving force to extend shelf life. A variety of sanitizers exist and the benefits and limitations those commonly used were discussed. It was stressed that "there is no perfect sanitizer" and that for each 2 days of desired code, hygiene must be increased 10-fold. The importance of properly cleaned sanitizing systems was stressed because these systems could become a source of contamination which would adversely affect shelf life.

Debra Henyon of Elopak addressed packaging parameters and equipment for extending shelf life. The filler was identified as a likely source of contamination on a packaging line and it was suggested that the shelf life of a product is dependent on the quality of the product at the filler. A controlled environment for the filling area could be used to limit contamination at this crucial step by filtration, sterilization by heat, and minimizing unprotected access. Chris Newcomer of New-Tech Consulting continued by informing about the requirements for facilities considering extended production runs for up to 70 hours. Parts of these are to ensure effective controls and operational procedures have been developed and implemented. Also the food safety risks, public health requirements, and equipment requirements have to be understood. The on-going operation of an approved plant has to be monitored. But food safety is the number one consideration.

Kristin Phillips of Publix Super Markets concentrated on the importance of refrigeration and distribution of milk. The primary reason for milk spoilage is temperature abuse. Therefore, temperature control is supposed to be in place from the silos to filling, storage, shipping, delivery and store handling. Different control systems were explained. Memsel Griffith of the University of Guelph addressed the growing concern of spore forming due to the prolonged shelf life. An overview of common and uncommon bacteria in milk was given. For *Bacillus cereus* it is possible to adapt to cold temperatures. Gene transfer is also possible during the growth of bacteria in milk. Control strategies as microfiltration, bactofugation, bacteriophages, and bacteriocins were proposed.

S05 – Post-processing Intervention Technologies

Kristen Matak, Virginia Tech and Stephen Flessa, University of California-Davis

Post-processing contamination has been responsible for numerous bacterial outbreaks in the past and continues to be a problem. Several intervention strategies were discussed during the session that can be applied by processors to reduce the risk of post-processing contamination. One of the strategies discussed was the effectiveness of in-package heat pasteurization of meat products. Historically, heat pasteurization has shown to be an effective means of decreasing bacterial populations. High costs and the effect on product quality are concerns that need to be addressed before considering implementation. Another in-package intervention technique discussed was the high pressure processing also referred to as 'cold pasteurization'. This process uses hydrostatic forces which are distributed evenly and instantaneously throughout the food product. While high pressure has been shown to inactivate vegetative cells, yeast, mold and some viruses, bacterial spores are more resistant. The cost of the technology is considerable and the food product must be "batch processed." Advantages of this technology include reduced processing times, and retention of natural flavors, colors and textures. The technology is considered environmentally friendly because the water can be filtered and reused.

Processing brines are the first exposure which some products have to the environment after the lethal step. This technique was identified as a potential step for recontamination and while changing the brine often would reduce the risk, reuse would be more cost effective because of time efficiency, reduced material costs, and reduced wear and tear on equipment. Disposal issues concerned with the volume of brine relative to the environment were addressed as being an area where further research was needed. Methods that were discussed to limit the risk of recontamination were the use of varying concentrations of NaCl and $CaCl_2$, different temperatures, and ultraviolet light.

Active packaging used to limit bacterial growth was described as "any material that serves as more

than an inert barrier." This is a technology where packaging films have the protective capacity to exclude pathogenic and spoilage microorganisms, and also to sterilize and destroy them. Some examples that were given were antimicrobials, scavengers, and gas regulators. Ready-to-eat meat was provided as an ideal product for use with antimicrobial packaging. It was stressed that antimicrobial packaging must not replace good manufacturing processes.

The final intervention strategy that was discussed in this symposium was the benefits/limitations of chemical treatments used to decontaminate or preserve foods. Chemicals discussed in the decontamination treatment included chlorine, sodium bisulfate, ozone, and lactoferrin. It was noted that some considerations that should be taken when determining which type of chemical should be used are sensory issues, adaptation and resistance of microorganisms, corrosion of equipment, and worker safety. Post-processing contamination is a problem that must be addressed by producers in terms of risk reduction, consumer acceptance, cost implementation, and environmental preservation.

S07– Recent Developments in *Listeria monocytogenes* Research

Wendy Maduff, University of California–Davis, and Laura Bauermeister, Auburn University

This symposium covered virulence patterns determined by molecular biology tools, environmental presence and transmission of *Listeria monocytogenes*. Also, the why and how *L. monocytogenes* causes disease in humans. Its behavior in food processing and storage environments was determined using predictive and dose-response modeling. Charles J. Czuprnsky looked at gene manipulation of *L. monocytogenes* in various lineages of mice as hosts. He was looking for difference in susceptibility in these mice. Another interesting objective was to look at how the growth medium affected virulence of *L. monocytogenes* and the implications of selected genes in virulence regulation of the organism.

F. Chris Minion described constructing and validating microarrays for *L. monocytogenes* and he made a brief mention of *Escherichia coli*. The greatest barriers in developing the microarrays, were variations in humidity for optimal drying conditions, appropriately drying the spotting buffer, failures in the substrate, voltage, and the elimination of background noise. An emphasis was placed on the fact that one must establish spot quality control to have dependable results.

Next, Mark Tamplin spoke about the development of growth models for *L. monocytogenes* and their potential impact. Before forming a kinetic growth model; hazards, regulations, modeling tools, and potential applications must be identified. First, the primary model is developed and fits curves to data (the measuring parameters). Finally, a tertiary model provides graphic interfaces and is the most critical step. Currently, models are being developed to look at lag time distributions, growth, peak population densities, and inactivation models. Model performance must be well defined by providing bias and accuracy factors. Several systems for performance measurement are being developed such at the Robustness Index, Safe Prediction Zone, and Bayesian Decision Theory. Then, Peter Cowen discussed how to design an effective risk communication program of *L. monocytogenes* in ready-to-eat foods. The objectives included identifying risky food handling behaviors and the relative risk to general and susceptible populations. Through focus groups and individual interviews, he found that people tended to distrust the industry because they do not have a solid grasp of how it works, however, when individuals were asked to elaborate, they stated that you ultimately just have to trust the industry. A few of the fundamentals developed in risk communication were to help people understand and relate fact to their lives and to put risk in perspective for each individual.

The fifth speaker, Lee-Ann Jaykus, detailed ongoing research that focused on the prevalence and persistence of *L. monocytogenes* in the turkey processing environment. Three bacteria common in raw turkeys and three turkey processing facilities were evaluated including drains, floors, and equipment. Two of the plants consistently had higher levels of *L. monocytogenes* and all plants had similar levels of *Salmonella*. She also concluded that biofilms were more likely to form when another organism such as *Staphylococcus aureus* was present.

Finally, Mary Alice Smith discussed the dose-response relationship of *L. monocytogenes* in animals. Currently, there are no dose-response models available for *L. monocytogenes*. The mechanism of susceptibility was determined in Rhesus monkeys, Guinea pigs, and mice. Primates closely approximate LD_{50} to humans but research is limited by the data that you are able to collect. Mice can provide you with more data, but the system is much further away in relation to the human system.

Guinea pigs are a good model but it is again difficult to make some comparisons.

S08 – Integrating Genomic Data into Quantitative Risk Assessments

Wei Zhang, University of Wisconsin-Madison and Dharmendrasingh Pawar, University of Georgia

This symposium is organized in the quest for advancing and integrating quantitative microbial risk assessment and molecular subtyping of pathogens for food safety control. Integrating molecular subtyping information into risk assessments on *Salmonella*, *L. monocytogenes* and *Campylobacter jejuni* were presented. The challenge of integrating genomic data in casual inference modeling and systems models was discussed. Potential applications were indicated, such as cross-contamination modeling, dose response analysis and hazard identification.

Tine Hald from Danish Institute for Food and Veterinary Research, Soborg, Denmark discussed *Salmonella* DT 104 subtyping as a means for hazard identification in quantitative risk assessments. The "known" part is the reported (observed) number of cases infected or the number of people infected. The "unknown" part is the number of people being infected by a particular subtype in particular sources. Maximum likelihood was used and a passion process was justified. Like all mathematical models, this model reflected a simplification of the real world. The model can be applied to estimate the primary source of human salmonellosis in Denmark.

Donald W. Schaffner from Rutgers University focused on modeling cross contamination of *Listeria monocytogenes* subtypes in processing plants. The uncertainty regarding the fraction contamination was represented by the beta distribution. Monte Carlo simulation technique was used to model the persistence and spread of *L. monocytogenes* in a virtual food processing plant. It's possible to set simulation parameters such that different virtual strains of *L. monocytogenes* predominated in different areas of the virtual processing plant.

Martin Wiedmann from Cornell University presented the use of the genome to define biologically meaningful pathogen subpopulations for a *Listeria monocytogenes* quantitative risk assessments. *L. monocytogenes* subtypes differ in their ability to cause human and animal disease. The goal of this work is to explore specificity and virulence differences among *L. monocytogenes* strains. The plaque assay was used to test *L. monocytogenes* invasion and cell to cell spreads.

William Ross from Health Canada discussed *L. monocytogenes* as a model for attributing risk to pathogen subgroups. The goal was to develop a subtype specific dose-response model and estimate the virulence parameters. They developed a dose-response model for subgroups and quantitative risk assessment framework for attributing risk to subtypes. Both food survey and clinical data were used to study the prevalence of subtypes in foods and illness. The biological meaning of the R value was discussed.

Aamir Fazil from Health Canada presented integrating genomic data in casual inference modeling and systems models. Epidemiological investigations were classified into three types: descriptive, analytical, and molecular. Dose response was potential for greater resolution to determine more virulent strain. A software package was illustrated and many examples were discussed for the applications of the models and software.

S09 –Sanitary and Hygienic Design, Construction, and Fabrication of Dairy and Food Equipment

Leslie K. Thompson, Kansas State University and Derrick Okull, Pennsylvania State University

Lyle Clem, director of engineering at ESC, opened the session with an overview of equipment standards, sanitary design/fabrication, and other current issues facing the industry. There are more than 10 standards organizations that have an impact on hygiene issues, the largest of which is the International Organization for Standardization (ISO), a network of national standards institutes in 148 countries. Its 9,000 and 14,000 standards series are among the best known. Others include the American Society for Testing and Materials (ASTM), the American Society for Mechanical Engineers (ASME), the American Welding Society (AWS), American National Standards Institute (ANSI), and the 3-A SSI, among many others. Some current issues facing the industry include the need for 3-A standards' interpretation, and standards' guidance on rotating seals. 3-A has proposed some new design standards for consideration.

Tim Rugh outlined some new directions for 3-A sanitary standards. Oversight and coordination process needs improvement, for example, the standards' development process may benefit from some form of board direction. Oversight authority would be vested in a board of directors, who would promote the use of standards, create a uniform system, educate all stakeholders, thus modernize the system. Some notable achievements by 3-A

include accreditation by ANSI and the certification of conformance evaluators. New opportunities still exist for the organization, such as in pharmaceutical equipment design.

Tracy Schonrock discussed the process for 3-A third party verifications. The third party verification is used for those applying for new requests for symbol authority, renewing 3-A symbol authority, or after report of alleged nonconformance. They must select a CCE, perform a third party verification (TPV) evaluation, and then submit the TPV report and the supporting documents to ASSI. The TPV evaluation requires the CCE and fabricator clearly define which standards and what equipment is to be evaluated. All of the engineering drawings, materials certifications, other documents, and the piece of equipment must be available for evaluation. The evaluation also encompasses checking for the existence of an EDTCF, existence of a QC program, proper use/display of 3-A symbol, and acceptable users manuals/information.

Deb Henyon discussed methods for determining the cleanability of food contact surfaces. Validation of cleaning of equipment is as important as equipment standards. Validating cleaning helps to attain an improved level of food safety and decreases liability by showing due-diligence. There are several methods for validating cleaning including visual inspection, soiling test, fluorescence detection with UV, inoculation, ATP, sugar, protein, allergen test, and agar methods. Some tools for verification of cleaning are ATP with buttermilk test, sugar test, protein test, allergen test, and modified agar methods.

Ken Anderson discussed the NCIMS third party pilot program for dairy imports. Two options that are available for companies to be able to import grade A dairy products to meet FDA requirements are that the exporting country's milk inspection must be equivalent to the US system or that a state adopt the plant under their regulations. Another option is for an inspection to occur that is equivalent to the current IMS program. They must have a qualified 3rd party auditor audit the facility. The IMS pilot program is important to provide the necessary level of protection for dairy products that are entering the US.

S10 – Food Safety for Immunocompromised Populations

Brae Surgeoner, University of Guelph and Lisa Mathiasen, University of Guelph

In recent years, there has been a growing awareness of foodborne illness and immunocompromised persons in the population. Characteristics of a person with increased susceptibility to infection, or to increased severity of illness if infected, are: HIV, pregnancy, aging, malignancy, solid-organ or hematopoietic transplant and some medications. Data generated from clinical reports, pathophysiological studies and public health surveillance have shown that such populations are indeed at a higher risk of getting sick from foodborne illness than people outside of this group. So why is this topic becoming such a concern? One of the issues discussed was demographic changes in the US population that predict a large percentage of the population will have increased susceptibility to foodborne illness. The demographic changes discussed were increased numbers of people living with gastric and renal diseases, inflammatory bowel disease, and HIV – diseases that people no longer die from, but learn to live with. Another issue discussed was the types of immunodeficiencies that are observed in the population. There are three major categories of immunodeficiency: primary (genetic defects), impaired cellular and humoral immunity (underdeveloped or diminished immune systems), and secondary (the result of many underlying causes like uncontrolled diabetes or chemotherapy treatment).

As risk assessments continue to determine the probability of a single event occurring and an at-risk person responding to it, such information will be useless if these groups are unaware of the risk. To protect at-risk groups, a combination of continual education and food engineering is needed. Some of the educational strategies used in the US were discussed and their effectiveness was evaluated. Although there has been abundant food safety information produced for children, there are few programs for the elderly and other immune-compromised groups such as people with HIV. Of the programs available to these groups, very few focus on food safety issues and many put more emphasis on the importance of eating a balanced diet and exercise.

In order for food safety information to be effective for immunocompromised groups, it must specifically address a target audience, without isolating them from the rest of consumers. For example, when addressing the elderly it was discussed that information should be produced in large print, should not involve the use of computers and should include pictures of other people, not just seniors. Despite educational attempts barriers do exist that will prevent them from being successful. Such barriers include a lack of knowledge, resist of chance, the belief that a risk can be controlled and

the overwhelming complexity of the condition. And while at-risk people may be willing to take risks to keep eating foods that they like, with the persistence of standard specifications, educational communication strategies, new food safety technologies, and food recalls, hopefully foodborne illness will be less of a threat to this vulnerable population.

S11 – Chatterbugs: Quorum Sensing and Food Safety

Manan Sharma, University of Georgia and Stacey Smith, University of Guelph

This symposium focused on quorum-sensing mechanisms and regulators that function in bacteria, particularly, in pathogens of concern to the food industry. Quorum sensing is the term used to describe the process by which cells communicate with each other by producing signaling molecules (autoinducers) that accumulate according to cell population density. Presenters discussed topics relating to factors in food environments that may have an effect on cell-to-cell signaling and the development of interventions that could be employed to control or inhibit quorum sensing. These techniques could be ultimately used to improve food safety.

Lone Gram of the Danish Institute for Fisheries Research referenced the movie, *Finding Nemo*, to help describe quorum sensing in gram-negative bacteria. Her presentation focused on quorum sensing and food spoilage, citing that 10% to 50% of all foods are lost post-harvest or post-slaughter due to microbial growth and activity. She stated that the signaling molecules used were acyl homoserine lactones, and the *lux*R gene in *Vibro fisherii* was regulated by quorum sensing. Different receptors are used for different signaling molecules, and structural analogs can be used to block cell to cell signaling to investigate these responses.

Donald W. Schaffner from Rutgers University explained that little is known about communication during spore germination. His laboratory research has provided evidence of communication by both *Bacillus* and *Clostridium* during spore germination. His experimental and simulation studies demonstrated that spores communicate during germination (stimulation) and that cells communicate with spores during growth (inhibition).

Mansel Griffiths of the Canadian Research Institute for Food Safety addressed the topic of quorum sensing mechanisms in *Listeria monocytogenes*. After explaining the different functions that are controlled by quorum sensing, including bioluminescence and EPS production, Dr. Griffiths answered the question of whether or not *Listeria monocytogenes* quorum sense. As a result of the bacteria producing biofilms and extracellular enzymes, Dr. Griffiths concluded that response regulators are ubiquitous among *L. monocytogenes* but it remains unclear whether or not quorum sensing regulates the expression of virulence factors in *L. monocytogenes*.

The next speaker was Vanessa Sperandio of the Univeristy of Texas Southwestern Medical Center who discussed quorum sensing regulators in *E. coli* O157:H7. Throughout her talk, Dr. Sperandio addressed a number of questions including whether or not cells of *E. coli* O157:H7 were responding to norepinephrine and epinephrine secreted by the host and if antagonists that disrupt this cellular response could be used therapeutically to treat enterohemorrhagic *E. coli* infections.

Addressing quorum sensing responses in *Campylobacter* spp., Chin-Yi Chen of the USDA presented studies comparing growth and survival patterns of the wild type and *lux*S mutant strains under varying temperature, pH, media and oxygen conditions. While there was no apparent difference in patterns between the two strains under most conditions, conditioned media was found to help *Campylobacter* survive in air at lower cell densities.

Finally, Suresh Pillai of Texas A&M University presented research entitled, Quorum Sensing on Foods: Interpreting Language from Noise. Dr. Pillai stated that the complete microbial cycle includes food production, humans and the environment, and that food safety is not exclusively a water or microbial or public health issue. Because pathogen response and physiology in the environment are impacted by sunlight, heat, moisture, and pH, Dr. Pillai proposed that microbial pathogens on foods are generally faced with different conditions as compared to the environment. Studies undertaken in his laboratory used real time PCR to determine expression of genes responding to quorum sensing. His laboratory was also investigating whether or not meat processing conditions affected a QS response in foodborne pathogens. To conclude, Dr. Pillai echoed Dr. Gram's comments from earlier in the session that a better understanding of microbial ecology is needed which can provide insight about shelf life and reducing pathogen survival.

S12 – Transfer and Spread of Pathogens in Food Environments

Katija Blaine, University of Guelph and Lynn Riggins, Kansas State University

Chris Griffith, University of Wales Institute, discussed transfer survival and persistence of pathogens with a focus on routes and relative risks. He identified the two main principles of food sanitation: prevention of contamination and prevention of survival and growth. Key issues, such as routes and pathways and transfer frequency and rates, were also discussed. He provided an overview of the ease of which pathogens can spread and survive and the implications for foodborne illness. He highlighted his own research which illustrated how pathogens are spread including specific routes such as through rinsing raw chicken in kitchens.

Barry Michaels, presented the principles of modeling cross contamination including a discussion on the determinants of transfer rates. His discussion of different soils, surfaces and cleaning focused on factors that affect the efficacy of cleaning disinfection treatments. This was followed by the factors involved in pathogen transfer and modeling issues for hands and surrogates.

Sabah Bidawid's (Health Canada) presentation focused mainly on viruses but briefly summarized the survival of select bacterial pathogens and parasites on various surfaces and environment. Also mentioned was the importance of emerging pathogens such as SARS, *Enterobacter sakazakii*, *Mycobacterium paratuberculosis*, Hepatitis E and Avian influenza. Research on Hepatitis A and Feline calciviru was summarized. Detailed information regarding the survival of these pathogens on certain surfaces, environments and in food, and environmental factors that affect survival were discussed. He concluded with future directions such as the need to gauge the potential for infection and develop appropriate intervention strategies, guidelines and eventually appropriate training and educational materials.

Ewen Todd, Michigan State University, described research conducted to develop a series of *Listeria* transfer coefficients that can be incorporated into risk assessment calculations to determine the likelihood of cross contamination between foods marketed by retail foodservice establishments and delicatessens. Preliminary work examined food adherence to contact surface dependent on type of food and surface.

H. Morgan Scott, Texas A&M University, discussed problems in quantifying transmission risk for foodborne pathogens and antimicrobial resistant enteric bacteria among populations of food animals and humans. This included the pros and cons of the different research approaches and the problems facing studies of humans, food animals, and food products. He then described a three-year longitudinal study to identify the force of infection p/w cohorts and population and between food animals and food products.

Mueen Aslam, Agriculture and Agri-Food Canada, provided a general overview of how *E. coli* is transferred to meat, including sources and processes, such as skinning, by which it is transferred. This was followed by implications of inadequate personal equipment cleaning (such as knives and gloves) and the effectiveness of decontamination processes (such as pasteurization). This was followed by the processes by which *E. coli* can grow on meat, where and how it can be redistributed after pasteurization, and the subsequent implications.

S13 – Indicator Organisms and Testing– Where's the Value?

Wei Zhang, University of Wisconsin-Madison and Bala Kottapalli, North Dakota State University

Testing of indicator organisms accounts for a large portion of all microbiological testing performed by the food industry. There is always a debate about the values of these test. In this symposium, the purpose, approach and specifications setting to the specific indicator organisms by the different food sectors were discussed. Indicator organisms for food processing environments, alternatives to indicator organism testing and cost benefit analysis were described.

Timothy Freier from Cargill Inc. discussed indicator organisms for meat and poultry products. He described the poor uses and good uses of indicator organisms. He suggested the best use of indicator organisms is in process control validation, shelf life prediction and prerequisite program verification.

Edward Arnold from Land O' Lakes Inc. discussed indicator organisms for dairy products. He talked about indicator organisms, including coliforms, *Staphylococcus*, *Listeria* genus, yeast, and mold. Furthermore, the methods used for indictor testing were described, such as VRB conventional agar, MPN techniques, 3M Petri film and MicroFoss. In addition, regulatory requirements, industry norms, process capability and competitive advantage were presented.

Mark Moorman from Kellogg Co. focused on indicator organisms for products with low water activity. Indicator organism used for these products include *E. coli*, fecal coliforms, coliforms and *Enterobacteriaceae*. Furthermore, the vehicles for finished product contamination and microbiological concerns in sensitive ingredients were discussed.

Larry Cohen from Kraft Foods presented indicator organisms for the food processing environment. The usage of a defined and aggressive environmental monitor program was suggested to control pathogens. The purpose of environment monitor program is to identify harborage areas and use data to correct problem areas before they pose a risk to product. There are several different types of microbiological environmental monitoring conducted in a plant and pathogen environmental monitor is an important one. Furthermore, the four zones of environmental monitor program were described. In addition, environment control program was described.

Richard Stier focused on the right bug as indicator organisms. He proposed that intelligent use of microbiology provides a valuable tool for developing information that can be used for decreasing hazards. It was emphasized to find problems before they occur, such as minimizing potential for economic spoilage. It was suggested to select proper methods based on product and proper application of the method to the product. In addition, the approaches for juice or fruit spoilage prevention and vacuum-packaged meats control were mentioned.

Lori Lendenback from Kraft discussed the cost benefit analysis of indicator organism testing. The value of non-pathogen indictor test and testing to meet regulatory requirements were described, as well as the role of indicator organism in process control or product performance.

In summary, this symposium took a close look into the area of indicator organism testing and the issue surrounding it.

S14 – Update on Foodborne Illness

Kristen Matak, Virginia Tech
and Brooke Whitney, Virginia Tech

Anthony Fiore began the session by discussing the outbreak of Hepatitis A in 2003 associated with the consumption of raw green onions at Restaurant Z. The multistate outbreak had a majority of its cases in PA (n=556). Because of the widespread nature of the outbreak, it is presumed that contamination occurred prior to distribution. Genetic fingerprinting showed that the cases from Restaurant Z were similar to outbreaks occurring in Mexico. From the available records, the implicated green onions were traced to one or more of four farms in Mexico.

Jack Guzewich continued the discussion of the Hepatitis A outbreak by detailing the inspection of the four farms which could have produced the onions. A ban was placed on all four farms, and the next season, two of the farms petitioned to have the ban lifted. Upon inspection, it was decided that these two farms still did not meet Good Agricultural Practices (GAPs) guidelines, and the ban was not lifted from any of the farms, and still remains to this day.

Amy Dechat talked about an outbreak of *Salmonella* Typhimurium DT104. This strain of *Salmonella* is resistant to ampicillin, chloramphenicol, streptomycin, sulfamethoxazole, and tetracycline. The case-controlled study used 28 victims and found that the victims were more likely to have medical problems and were less likely to have high school diplomas. Also reported was the consumption of raw ground beef "noodles" during preparation of the meal. No recall was issued, but in response, FSIS issued an alert in January of 2004 stating the importance of properly cooking ground beef prior to consumption. Dechat had several recommendations including irradiation, reevaluating HACCP plans, making Multiple Drug Resistant (MDR) *Salmonella* an adulterant, and the elimination of non-medical antibiotic use for cattle.

Emilio Estaban continued discussion of the DT104 outbreak, detailing the food safety assessment of the implicated processor that occurred 2 years prior to the outbreak. The processor uses 70% cull dairy cows from over 30 states and 1,500 suppliers. Due to the large number of suppliers that can be processed each day, it would be impossible to identify the specific farm from which the implicated meat originated. He recommends further research is needed into the virulence of MDR *Salmonella* before it is labeled an adulterant.

Asim Jani gave details about the first case of DT104 associated with eating whole beef. The outbreak occurred at a holiday gathering at a hotel. The implicated food was a whole steamship round of beef, described as "raw" or "bloody" by those in attendance. The roast had been prepared by slow cooking in a low heat oven until the internal temperature reached 140°F. However, the thermometers used to read the temperature were not long enough to have been able to reach the center of the roast. Though it was assumed the roast was not cooked to the proper temperature all the way through, questions still remain about how the DT104 was able to penetrate the roast, and whether the vacuum packing was able to facilitate the movement.

S15 – Everything You Wanted to Know about Adopting New Methods... But Were Afraid to Ask

Wei Zhang, University of Wisconsin-Madison and Huimin Zhang, North Dakota State University

New methods in microbiology are continuously being developed with the advancement of science and technology. It is necessary to understand the steps to implement and validate new methods. This symposium aims to inform about the development of a new idea into a valuable product on the market, such as how methods are prepared by their inventors to withstand all the requirement of the marketplace.

Ruth Firstenberg from BioSys discussed the innovation process from an idea to a new rapid method on the market. Jay Ellingson from Marshield Clinic Laboratories presented preparing new methods for the microbiology laboratories. Sharon Brunelle from Brunelle Biotech Consulting talked about both the United States and international regulatory approval process to get a new method accepted. Roy Betts from Campden & Chroleywood Food Research, UK focused on generating independent data for regulatory approvals and the types of data required. Mark Carter from Kraft Foods presented the Kraft experience in implementation of a novel method. Tim Jackson from Nestle Research Center talked about the Nestle experience on the implementation of a novel method. The last two speakers descried the cases study to show how these two major food processing companies adopted new methods. In this symposium, both the US and international process were discussed, including approval process, the types of tests that methods have to pass, inclusively and exclusivity studies, comparative studies against a reference method, ruggedness trials and examination of the limits of detection or quantification, as well as how to obtain the high degree of confidence of a new method.

S16 – Food Toxicology 101: Basics for the Food Safety Professional

Stephan Flessa and Wendy Maduff University of California-Davis

This symposium covered techniques, development of modeling systems, and research-relevant issues concerning the bacterial pathogen *Listeria monocytogenes*. Stanley Omaye of the University of Nevada–Reno discussed the historical background of food safety and covered the basics of food toxicology. Food toxicology, a subdiscipline of toxicology, deals with toxicants found in food, either from nature or through contamination, which have a harmful effect on a target organism. For the toxic effect the dose response relationship has to be considered. Important toxicants are pesticides, food additives, contaminants, and naturally occurring toxicants. The relevance of toxicology was stressed by showing 65 naturally occurring carcinogens/mutagens out of the 200 involved with food safety. The case was made for the need to expand education, research, and extension outreach. Current resources and societies were listed.

Next, Terry Troxell of the FDA spoke about the FDA's approach to emerging and environmentally persistent microbial and chemical contaminants in food, and how to deliver the correct message to the consumer from information ascertained from the risk assessments. For example, it has recently been documented that more than 700 foods contain acrylamide; however, most of these foods have minimal amounts. But consumer advice will be developed to minimize exposure. He also discussed furan, which is present more common than thought. But here no action is taken because the exposure is much smaller than the NOEL. Also addressed were percholrate, dioxin-like compounds, and polychlorinated biphenyls. PCBs e.g., are found in salmon, but the dietary effect of the fish is greater than the harm by PCBs, so the consumer is not advised to change their diet.

Barbara Petersen of Food and Chemicals Practice detailed the impact of mycotoxin risk assessments on international trade. Risk assessments were addressed as well as the involvement of the distribution of mycotoxins, the frequency of occurrence, consumer consumption patterns, and the a measure of toxicity. Furthermore sampling procedures have important effects on the resulting exposures. All these steps have influences on the risk assessment, so one must understand the assumption and limits of a risk assessment.

Joseph Hotchkiss of the Cornell University addressed hot topics in food toxicology. In the '70s and '80s food technology mostly concentrated on carcinogenic testing, establishing testing methods, and determining a maximum tolerated dose; concentrating on a single chemical. But today the focus has shifted to test food as a whole, and include testing for allergenicity. Furthermore, molecular genetics are now employed, and the effect of genetical engineering is studied. Most recently food toxicology also deals with the

regulatory management of naturally occurring toxicants.

S17 – *Salmonella* Control in Broiler Chickens: What Can We Learn from the Scandinavian Experience

Laura Bauermeister, Auburn University and Dharmendrasingh Pawar, University of Georgia

This session focused on the implementation of *Salmonella* control programs in the Scandinavian countries and how we could adapt these systems to US production practices in an economically feasible manner. Johan Lindblad discussed current *Salmonella* control programs in Sweden and Denmark. In Sweden, the program is regulated by the government and requires that any food animal testing positive for *Salmonella* is considered unfit for human consumption. The five principles employed in their programs for poultry included: (1) day old chicks must be free from *Salmonella*, (2) birds must be provided *Salmonella*-free feed and water, (3) birds must be kept in a *Salmonella*-free environment, (4) the involvement of active surveillance programs and (5) monitoring of the final product. If a flock tests positive for *Salmonella*, it has to be destroyed. The Nordic countries have effectively implemented *Salmonella* control programs and in some cases virtually eliminated *Salmonella* in broilers. Effects of implementing these programs include improved animal health, less human exposure and a less polluted environment.

Next, Stan Bailey focused on how we could economically adapt the Swedish and Danish *Salmonella* control programs to the US poultry production systems. Denmark followed Sweden's example by implementing *Salmonella* control programs in the early '80s after finding a high incidence of *Salmonella* on farms. The Swedish program applies control measures at the farm and no control is necessary at the processing facility. The Danish program differs a little from the Swedish program in that *Salmonella*-positive birds can be sold in commerce, however, the flocks must be processed separately. Bailey suggested that the US model could include programs that start at the breeder-level, including vaccination programs and competitive exclusion programs. If broiler chicks at the farm-level were *Salmonella*-free, it should be sufficient to apply good biosecurity measures and possibly competitive exclusion programs to control *Salmonella* at the farm. Here in the US, it is unlikely that the government would absorb any of the costs associated with the implementation of these programs, so unless federal regulations were adopted *Salmonella* control measures would not be implemented. He concluded that the best way to control *Salmonella* is on the farm; if birds are never exposed they will not be infected. We should look at the most economically feasible ways to apply control measures.

Lastly, Tanya Roberts discussed the economic analysis of implementing *Salmonella* control programs in the US. She focused on the Danish program which is a newer program that used the Swedish program as a guide. Roberts pointed out a few biosecurity measures that could be applied at the farm-level to reduce *Salmonella*. Some of the results of the *Salmonella* control programs in Denmark included an increase of broiler exports and the creation of a new market (*Salmonella*-free). She had created a 4-year example timeline of how the US could implement a program similar to the Danish program and estimated that the cost of implementing such a program would, in the long run, be approximately 10 cents per broiler. The Nordic countries have a much smaller broiler production system than that in the US and it is necessary to look at the principles that were applied in the Nordic countries and why they worked to develop a program for the US.

S19 – Risk and Control of *Enterobacter sakazakii*

Manan Sharma, University of Georgia and Bala Kottapalli, North Dakota State Univeristy

This session gave a comprehensive overview of the relevant issues concerning the emerging bacterial pathogen *Enterobacter sakazakii*. Dr. Maria Narrowec-White, (Agriculture and Agri-Food Canada, Canada) covered characteristics of the pathogen, including its increased osmotolerance over other Gram negative pathogens, its unique biochemical profile, its colony morphology and its susceptibility to pasteurization. Infections cause retarded neural development and have a 50% mortality rate among infants. Reservoirs for the pathogen remain poorly identified but it has been found in dry milk powder plants, chocolate and cereal factories.

Dr. Steve Forsythe (Nottingham Trent University, UK) described problems in detecting and identifying *E. sakazakii* using conventional methods. He stated that VRBGA may not be the best media for detecting *E. sakazakii*. Media developed that included tryptic soy agar, sodium thiosulfate,

ammonium iron citrate, sodium deoxycholate recovered a greater number of cells than other types of media. Growth of the organism in some enrichments depended on the strain of *E. sakazakii*, and reference strains used to identify the microorganism may not have been *E. sakazakii* but rather *Citrobacter boseii*.

Dr. Les Smoot (Nestlé USA, USA) emphasized strict process controls, adherence to critical control points in HACCP plans, and separation of wet and dry operations in the plants to limit contamination when formulating powdered infant formula (PIF). He emphasized that the presence of *Enterobacteriaceae* in dry operations is a good indication that moisture might be present in dry operations. The addition of nutrients and vitamins to the powder after the heating step, a critical control point, also provides opportunity for *E. sakazakii* to contaminate the product. Common ingredients (sucrose, lactose, lecithin, and starch) to PIF have shown the presence of *E. sakazakii*. Dr. Jaitinder Bhatia (Medical College of Georgia, USA) brought a clinical perspective to the discussion. He stated that the use of reconstituted PIF was essential to providing proper nutrients to neonatal infants, and the risks using these types of formulations was justified because of the benefits in development that occur in the neonates compared to the lack of development when using liquid sterile formula. Physicians are concerned about the high mortality associated with *E. sakazakii*, but the relatively few number of cases did not justify devising a new system to feed neonates.

Dr. Marcel Zwietering (Wageningen University, The Netherlands) constructed risk assessment models for *E. sakazakii*. His models used the estimated total number of 10 cases over the last 40 years to determine an R value for the pathogen, which was then set at 8.9×10^{-6} (the chance that one will develop an infection of *E. sakazakii* after a feeding). However, he emphasized the use of these values and the construction of models as estimates and not fixed values, and more efforts are needed in this area.

Dr. Don Zink (Food and Drug Administration, U.S.A.) discouraged the use of boiling water to reconstitute PIF because it may destroy or precipitate nutritive compounds, and children may be scalded during preparation. He indicated that the presence of the organism may not be based on the amount of material analyzed per sample. He emphasized the use of proper sanitation and hospital worker training, which would limit the incidence of *E. sakazakii* and other opportunistic gram negative organisms present in infant formula. Overall, the sessions provided an exhaustive examination of the issues surrounding control of *E. sakazakii*

S20 – Impact of Environmental Viral and Parasitic Contamination on Food Safety

Stephanie Drake and Efstathia Papafragkou
North Carolina State University

Enteric viruses are important foodborne pathogens associated with many foodborne outbreaks from consumption of various food products, mainly shellfish, fresh fruit and vegetables as well as ready-to-eat-foods (RTE). Enteric viruses can be transmitted by the fecal-oral, person to person and airborne route. Another less likely source can be potential animal reservoirs (swine, cattle) of these viruses that contaminate water supplies which then come in contact with food or humans (drinking, swimming, irrigation water). Viruses cannot replicate in food or water and, moreover, they can withstand a wide variety of food storage and processing conditions. They have properties that make them environmentally stable to extremes in pH, and low temperatures, as well as to enzymes present in the human gastrointestinal tract. Taking into consideration their usually, low infectious dose, virtually any kind of food product can serve as potential vehicle for transmission of viral pathogens. The ability of contaminated food to serve as a vehicle of infection depends on virus stability, dose needed to produce infection, and host susceptibility. Factors contributing to virus transmission are improperly treated sewage polluted with human waste, lack of sanitation and personal hygiene, and improper preparations of RTE foods from foodhandlers. Control and prevention of virus persistence and transmission can be achieved by intervention strategies that can interrupt viral transfer, such as chemical disinfections of food surfaces, effective decontamination of foodhandlers's hands as well as application of various physical methods (UV irradiation, temperature control) to foods. Also, the application of good agricultural practices, HACCP systems, effective vaccination and an updated database collection center would enhance the surveillance of enteric viruses.

In the last decades, several large foodborne outbreaks were associated with parasites from the consumption of fresh fruits and vegetables. There are 2.5 million foodborne illness associated with parasites each year, which is believed to be underestimated due to poor detection methods. Parasites enter the environment by infected people and animal waste material coming in contact with water or food. Some of the reasons that have

contributed to spread of parasites into the food chain include shifts in consumers' views about diet, increase in international travel, globalization of the food supply, and increase in the consumption of undercooked or raw meats. While parasites do not replicate outside of a host, they do remain infectious; moreover, they have evolved in a way that they can survive various processing treatments. Current detection methods rely on high price molecular techniques and microscopic techniques. There is an urgent need for improved and more sensitive detection techniques as oocysts are not usually found in large numbers in contaminated products. Control and prevention methods rely on waste material management, as the cost for treating the livestock is prohibiting high. Animals produce 1.4 million tons of waste, while in comparison humans produce 1/100. Potential animal manure treatments that can be employed include composting, land applications, biocontrols, chemical disinfection, as well as physical and chemical treatments for human waste disposal.

S21 – Safety of Raw Milk Cheeses

Kristen Matak, Virginia Tech and Wei Zhang, University of Wisconsin

Raw milk cheeses are gaining popularity and health authorities and researchers alike question the safety of these products. Raw milk cheeses are those made from milk that has not undergone pasteurization (minimum 71.7°C for 15 s or more). Linda Harris of University of California at Davis gave an overview of dairy recommendations commissioned by the National Academy of Science (NAS). The controversy over performance standards of the 60-day holding period of raw milk cheeses exists because effectiveness of this strategy is unclear. The NAS acknowledges that pasteurization of milk will reduce foodborne illnesses associated with these products and recommends clear and concise labeling for raw milk products.

Kathyrn Boor of Cornell University presented the history behind the 60-day holding period of raw milk cheeses. Pasteurization is required for soft, fresh cheese like cottage, cream, mozzarella, etc., but it is not required for cheeses that are cured. Pasteurization is not required for cheddar cheese but the holding period for 60 days is needed. Pasteurization and aging requirements were brought about after a series of typhoid outbreaks in the mid 1900s but recently it has been shown that some pathogens are able to survive longer then 60 days. Elliot Ryser of Michigan State University gave a review of the survival and the effects of aging on pathogens in cheese. *Listeria monocytogenes*, *Salmonella* spp., and *Escherichia coli* O157:H7 were identified as high risk pathogens and the ability of these pathogens to persist longer then the 60 day aging period is of concern.

Catherine Donnelly from University of Vermont discussed current cheese outbreaks and noted that post-pasteurization contamination was cited as the most frequent cause of contamination. Tradition, economics, flavor, and consumer demand were reasons cited by Debra Dickerson of Singular 3D Cheese to allow the tradition of raw milk cheese production to continue in the United States. A cheese tasting followed the presentations so that taste comparisons could be made between raw and pasteurized milk cheeses.

S22 – Packaging Innovations, Safety Concerns and Seafood

Richelle Beverly, Louisiana State University and Leslie Thompson, Kansas State University

Marlene Janes and Kathleen O'Donnell convened this symposium that highlighted issues such as; packaging concerns of *Listeria monocytogenes* and *Clostridium botulinum* and seafood. It also covered issues on antimicrobial edible films and the regulation of seafood packaging.

Douglas Marshall of Mississippi State University covered the topic of "Modified Atmosphere Packaging and *Listeria monocytogenes*." This is a bacterium with the ability to grow at refrigerator temperatures with or without a vacuum. Studies show that the modified atmosphere packaging reduces the growth of *L. monocytogenes* when compared to standard packaging.

Jon Bell, of Louisiana State University, discussed "Reduced Oxygen Packaging and *Clostridium botulinum* Safety Concerns for Seafood Processors." The processing for the collection and packaging of Bowfin Caviar worried processors that it would encourage the growth of *Clostridium botulinum*. It was illustrated that the use of salt at certain levels addresses this critical control point (CCP) in a seafood processors hazard analysis critical control point (HACCP) plan.

"Industry Perspective of Regulations on Reduced Atmosphere Packaging of Seafood," was presented by Jeffery Rhodehamel of Cryovac/Sealed Air Corporation. The use of time temperature indicators (TTI) is more widely used. It was also stated that better barrier shrink bags, barrier laminates or nylon pouches need to be developed to improve and maintain quality while begin aware of the danger that packaging that does not allow for the

penetration of oxygen poses to the growth of *Clostridium botulinum* and its toxin.

"Technological Perspectives: Reduced Oxygen Packaging of Seafood" was presented by James Cox of Vitsab, Inc., Belmont, North Carolina. Cox discussed the alternatives to Time Temperature Indicators (TTI) such as FreshTag Technology and Frozen Stage II Shrimp. These new alternatives to TTI are easier to deploy and less expensive.

Marlene Janes of the Department of Food Science, LSU Ag Center, and Baton Rouge, LA discussed "Antimicrobial Edible Coatings for Protection from Foodborne Pathogens." Edible films made of lipids, resins, carbohydrates and proteins are effective in reducing microbial counts. Janes stated "Greater understanding of film and coating properties, edible antimicrobial films and coatings could be effectively developed for any food product for protection from spoilage and foodborne pathogens."

Mary Losikoff of the Office of Seafood/CFSAN, Food and Drug Administration discussed "FDA Perspective on Reduced Oxygen Packaging of Seafood." The concerns of the FDA is that reduced oxygen packaging (ROP) may extend shelf life by preventing the growth of aerobic spoilage organisms. ROPs open the door for potential for growth and toxin production of nonproteolytic *C. botulinum* at refrigeration temperatures without visible signs of spoilage.

S23 – Heat Resistant Spoilage Microorganisms in the Juice and Beverage Industry

Derrick O. Okull, Pennsylvania State University and Huimin Zhang, North Dakota State University

In this session, Dale Morton gave an overview of heat resistant spoilage microorganisms in the juice and beverage industry. Heat resistant, spore-forming microorganisms continue to cause spoilage problems in the juice and beverage industry. As a result, companies regularly test for the presence of heat resistant spore forming bacteria and molds in juice concentrates and other non-juice ingredients. *Alicyclobacillus* spp. and *Byssochlamys fulva* were identified as the most problematic spoilage microorganisms in the industry. In the past decade, economic losses from *Alicyclobacillus* related product recalls have grown, and the demand for *Alicyclobacillus*-free products has grown. Since this organism is ubiquitous and heat-resistant, most food manufactures have failed to meet this demand. *Alicyclobacilli* prefer to grow under low pH, high temperature conditions unlike other spore-forming bacteria. These conditions are similar to those in which acidic foods stored at room temperature are found. Their control is further complicated by their high degree of heat resistance, and their ability to survive for long periods under unfavorable conditions. Thermal processes can therefore be unrealistic because of environmental influences on the processed products.

Joe Shebuski compared different culture techniques for the identification of *Alicyclobacillus* species. There is considerable variation among some of the most commonly used detection media such as K-agar, BAT agar and acidified PDA medium. More data is still needed on the prevalence of *Alicyclobacillus* in beverages. In order to enforce any requirements for zero-tolerance, an enrichment step should be included in testing protocols because of the ubiquitous nature of *Alicyclobacilli*. Despite the possibility of spoilage by this organism, guidelines will require much review, because not all *Alicyclobacilli* can cause spoilage, for example.

Mickey Parish and Randy Worobo discussed developments in the detection and confirmation of *Alicyclobacillus* in beverages. Cultural methods are still commonly used, but there are efforts to develop molecular based methods to assist especially with confirmation of presumptive tests.

Larry Beuchat gave an overview of heat-resistant molds of concern in the juice and beverage industry. Among the most common species are *Byssochlamys fulva*, *Neosartorya fischeri*, and *Talaromyces* sp. All the molds have both vegetative and sexual stages; the sexual stage is responsible for producing the heat resistant ascospores. Differences in each of the species are clearly visible when the ascospores are viewed microscopically, and help in identification of potential spoilage problems. The ascospores only form under specific conditions of growth, and are easily activated by the thermal processes applied to most beverage products. Despite decades of research activity and a well-documented body of knowledge about heat resistant molds in juices and beverages, spoilage of these products remains an important issue for many food manufacturers.

Paul Gerhardt outlined some *Alicyclobacillus*-mediated effects on juice and beverage products. Spoilage by *Alicyclobacillus* is typified by strong offensive off-odors due to the production of guaiacol and other phenolic end products. A sensory evaluation study of formulated juice products

established the development of mustiness associated with *Alicyclobacillus* contamination.

S24 – Sanitation: Because You Have to Be Clean to Be Safe

Katija Blaine, University of Guelph and Lynn Riggins, Kansas State University

Ann Marie McNamara, Silliker Inc., began the symposium with her presentation on microbial growth and removal in a plant environment which included a discussion of the formation and importance of biofilms in food environments and implications for sanitation. She also identified growth niches, equipment and environment characteristics that are favorable to biofilm formation. She discussed environmental monitoring programs to identify biofilms and plant contamination, sanitation considerations for wet and dry processing environments, some specific considerations for *Listeria* monitoring in ready-to-eat facilities and lessons learned from *Listeria* control programs. She concluded by describing the concept of and special considerations for allergen clean.

Fred Reimer, HEB Grocery Co., presented the principles of sanitation from the grocery retail perspective. The lines between manufacturing and retail have been blurred which has resulted in increased sanitation challenges for retail stores. He described the application of the HACCP food safety assurance pyramid to food retail sanitation. Also discussed were the elements of an effective sanitation program including adequate resources and commitment from senior management. Anecdotes were used to illustrate barriers (such as inadequate resources) and ways to overcome them.

William E. McCullough, Arby's Inc., opened with the importance of sanitation and cleaning in foodservice operations. He described the components needed to make sanitation a core value such as training, procedures, tools, responsibility, and partners. Also stressed was the need for corporate commitment and cultural change for successful adoption of these principles.

Dennis Stearns, Marler and Clark, spoke about the types of claims that a suspected producer of contaminated foods may face in the event of an outbreak–including strict liability, negligence and breach of warranty (express or implied). The purpose of these tort claims is to compensate the injured victim. He described the differences between the types of claims using illustrative examples and highlighted ways for a company to protect itself. He distinguished that what makes a food product defective is if it is unsafe beyond that which would be expected by an ordinary consumer. He concluded with a case study on a 2003 outbreak of *Salmonella javiana*, involving a major chain restaurant, to illustrate the consequences of poor sanitation programs.

Chris Remus, Johnson Diversity, discussed the core aspects of a sanitation program and sanitation crew including external factors that affect sanitation (such as changes in plant technology and chemical usage). Discussed were the five core aspects of a sanitation program: management commitment, procedures and practices, training/education, implementation and auditing. The components of a sanitation crew included education, sound SSOPs, reinforcement, monitoring, teamwork, and reward. Also discussed were the challenges of obtaining these components, ways to overcome these challenges, and costs of a sanitation program.

S25 – The Global Food Safety Initiative

Stacey Smith, University of Guelph and Richelle Beverly, Louisiana State University

The IAFP Foundation Fund sponsored this session which was convened by Louise Fielding and David Lloyd entitled "The Global Food Safety Initiative (GFSI)." This symposium covered topics encompassing food issue globally.

Jill Hollingsworth of the Food Marketing Institute gave a "Global Food Safety Initiative – Overview". She mentioned that in 1999 a group of global retailers identified the need for a more reliable, credible and consistent method for assuring supplier food safety performance. The Global Task Force of retailers in 2000 identified the needs and a plan for implementation, strategy for communicating with all retailers, suppliers and consumers. The new standards were established based how audits are to be conducted, use of ISO Guide 65 for management of certification bodies, and on international accreditation.

Carole Payne of EFSIS Certification, Milton Keynes, UK talked about "Understanding the Audits: Getting the Right Decision." Private companies are leading the way for certification and inspection specialist in agri-food throughout world, along with collaboration between the meat and livestock commission. One-Stop-Inspection shopping: EFSIS can undertake multiple inspections on the same visit, thus reducing cost and time to industry. It is also approved by all UK multiple retailers including Burger King, McDonald's, and others.

"The Standards-Similarities and Key Differences" was presented by Gordon Hayburn of University of Wales Institute-Cardiff, Cardiff, UK presentation. Food safety is a non-competitive issue. The

philosophy of food safety management is generally very similar in promoting higher standards and is gaining wider acceptance. The future of GFSI is to ensure a common approach to the mechanisms and means of approval with the inclusion of more standards under the approved banner.

Louise Fielding of University of Wales-Cardiff, Cardiff, UK presented the "Benefits to Business–The Manufacturer." The small manufacturers are having a hard time with HACCP. Plans have been put in place to help small businesses gain certification. By doing this the companies perform up to standards that are endorsed by the majority of the large multiple retailers, certification which allows small and medium establishments to target a wider customer base, company branded products, and local producers in local stores. There are clear financial and operational benefits to manufacturers, globalization of the food industry when certification is achieved.

"Challenges to the Adoption of Third Party Safety Assurances Certification in the USA and Canada," was presented by Paul Ryan of the Food Marketing Institute in Washington, D.C. He explained that third party certification and internationally accepted mechanisms, whereby audits are undertaken by suppliers' food safety and quality management systems have been documented to meet the requirements of a specific standard, scheme or code to determine its compliance.

The symposium concluded with a panel discussion. Gordon Hayburn of University of Wales Institute-Cardiff, Cardiff, UK led the discussion. There were approximately 65–70 people in attendance.

S26 – Optimizing Data and Minimizing Risk

Derrick O. Okull, Pennsylvania State University

Every year, food processors and manufacturers spend millions of dollars on microbial testing and data collection related to food safety. However, the right data is often not collected, or companies do not know what to do with data once it is collected. This session was convened to address this problem.

L. Smoot, filling in for Cindy Ryan, discussed the use of trend analysis and data management techniques to drive continuous improvement. He discussed the importance of a monitoring system that improves data management by generating information to make decisions. The two stages of data management entail generating the information through data collection and tabulation and then advancement into analyzing data trends to predict outcomes an assess correlations. Over the long term, data is also regularly reviewed to continuously improve processes.

J. Konarcki discussed the role of raw ingredient and finished product testing within the big picture of risk management. He proposed some criteria for statistical confidence associated with microbial data, such as sampling techniques, confounding factors like die-offs and clumping among microorganisms in the food. Risk assessments based on HACCP plans must accord equal attention to prerequisite programs such as SSOPs and GMPs, otherwise testing programs may not accurately reflect microbial risks. Companies must also be willing to consider frequent re-testing for quantitative estimates of microorganisms that are based on probabilities such as those in large batches of products. He concluded that finished product testing is inadequate for risk assessment, but environmental testing on the other hand can be a powerful tool if applied within the criteria for statistical process control.

Don Schaffner gave practical examples and case studies of modeling and risk assessment to solve food safety problems in the food industry. Care must be used however, in using such data to make decisions on food safety; the data are general guides to decision making, and should not replace actual testing to determine real risks.

Lynn Leger and Michael Brodsky presented a discussion on microbial mapping the 6 sigma methods of data analysis for microbial risk assessment. The data used to make risk assessments must be representative and be of good quality, otherwise uncertainties with analyses of the data would occur. Choice of analysis methods depend on performance characteristics such as specificity and fit for purpose. For example, the choice of microbiological media, analytical procedure, equipment, and personnel all influence the quality of data. During analyses, considerations on trend data such as control charts, variation over time versus spread of data, or statistical significance versus observation, must be factored in for balanced decision making. Cause and effect relationships should be carefully observed, for example, shelf life of products can correlate positively with maintenance records of equipment. Another example of possible correlations is the number of complaints versus test results. In microbial mapping, ecological relationships are used as a tool to determine microbial locations. This preventive measure and problem solving tool can locate the source of a microbial problem using genetic fingerprinting and then prevent the movement of microorganisms through a food processing plant to enhance shelf life and improve food safety.

S27 – Biofilms and Their Impact on Food Safety

Leslie K. Thompson, Kansas State University and Huimin Zhang, North Dakota State University

This session discussed current and future areas in biofilm research, attachment of human pathogens to plant surfaces, biofilm formation on meat products, and a company's perspective on prevention of biofilm formation in the food-processing environment.

John Dutcher gave an overview of new research developments in microbial attachment. He discussed two theories that explain the formation of biofilms: DLVO theory and extended DLVO theory. The attachment of biofilms to surfaces is facilitated by bacterial cell wall polymers, pillae, and flagellum. Biofilm formation involves three steps: attachment, colonization, and growth. The main experimental areas on biofilm include molecular biology genetics, advanced microscopy and physical measurements of bacteria and biofilms. In biofilm expression technology, microenvironments including chemical, physiological, and physical environments are investigated. This research area involves the population dynamics of bacteria and biofilms, cellular models of biofilms, nanoscopic models of bacterial membranes, discouragement of adhesion and removal of bacteria, cationic antimicrobial peptides, and substratum modification. The nanoscopic model focuses on the interactions of antimicrobial agents with LPS. The challenges for future research lies in biofilm phenotype, probes for heterogeneous biofilm, and improved reproducibility of biofilm growth.

Maria Brandl discussed attachment and formation of aggregates by human pathogens on the plant surfaces. She discussed her studies on localization of *Salmonella* Thompson in the phyllosphere of cilantro. Her research shows that there are many factors involved in the attachment of bacteria to plants. There are differences between attachment between enteric organisms as well as between strains or serotypes of pathogens. There are also multiple bacterial determents involved in the attachment of the organism to plant surfaces. The classical biofilm formation model, namely, attachment, mushroom formation, pores and channels, is very unlikely in plant model. Plant surface heterogenecity and lack of constant water flow allow no potential for aggregate formation.

James Dickson discussed microbial attachment to meat and poultry. Biofilms on extraneous material are often transferred from the hide or intestinal tract of the animal to the carcass surface and intervention strategies are capable of killing some but not all of the bacteria. As the meat is processed, it comes in contact with conveyor belts and can form biofilms on the belts. The biphasic culture scenario of vacuum-packaged encourages microbe growth; as a result, biofilm develops on the meat and film surfaces. Biofilm detachment is facilitated either with cellular erosion, or sloughing/abrasion by which lead to large chuck of biofilm loss.

Joe M. Stout discussed practical solutions to control microbial attachment in food processing plants. He began with some basic information on sanitary zones. There are four sanitary zones:

1. Product contact surfaces
2. Surfaces adjacent to contact surfaces
3. Same room
4. Area just outside of processing room

He presented an equation for prevention of biofilms: sanitary design of equipment and buildings + effective sanitation process control + frequent cleaning regime + sanitation verification and documentation = biofilm control. To assure removal of biofilms, there are several factors to consider. Consider the effectiveness of the cleaning process; define the what, why, and objective; map out the sanitation process; avoid recontamination; clean effectively and efficiently; and put equipment back where it belongs.

T02 – General Microbiology and Sanitation

Stacey Smith, University of Guelph and Richelle Beverly, Louisiana State University

This technical session featured twelve presentations on topics relating to sanitation in food production, preparation and service. Contamination of food contact surfaces continue to be a serious food safety concern, and new technologies and techniques for detecting, recovering, and subtyping pathogens are becoming increasingly valuable.

Chris Griffith of the University of Wales Institute-Cardiff presented two studies. In the first, new microbiological surface sampling kits were evaluated with the conclusion that sensitivity and reproducibility of the swabs were important and that these aspects were both improved with the new swabs as compared to the control. In the second study, Chris discussed the standards of cleanliness in English Butchers' Shops. While he acknowledged that cleanliness is improving, test results indicated that there is still a great potential for cross contamination in these shops.

Gordon Hayburn, also of the University of Wales Institute-Cardiff discussed a survey of English butchers' beliefs and perceptions about HACCP. The results of the study indicated a positive perception of HACCP, improved hygiene and shop efficiency, and most butchers did not find the food safety management system overly demanding on money or time.

Keith Vorst and Lindsey Keskinen of Michigan State University discussed the transfer of *Listeria monocytogenes* in delicatessens. Keith found that the pathogen can still be transferred from an inoculated slicer blade to ready-to-eat deli meats after 30 slices. Lindsey's study showed that *L. monocytogenes* is transferred to ready-to-eat turkey in greater amounts from knife blades contaminated with the strong biofilm.

Brian Sheldon of North Carolina State University presented results of a study that demonstrated the efficacy of commercial HabaGUARD® conveyor belts. These belts are designed to prevent biofilm growth and the belts containing an inhibitor did limit the populations of most spoilage organisms and bacteria although some of the resistant organisms included *Escherichia coli* O157:H7.

Also of North Carolina State University, Stephanie Drake discussed results of a comparison in the recovery of *Vibrio vulnificus* using sodium pyruvate. As *Vibrio* bacteria are a major food safety concern in the seafood industry, the study indicted that media supplemented with sodium pyruvate may aid in recovering *V. vulnificus* cells sublethally injured by exposure to food processing-related stresses.

David Nyachuba of the University of Vermont presented a study on the efficacy of fourteen sanitation compounds to eliminate *Listeria monocytogenes* from seven different footwear materials used in food processing environments. Results indicated that three of the footwear materials could withstand sterilization and all sanitation compounds tested were effective against the pathogen. David concluded that overshoes have a great potential for use in food processing plants as they contribute to reducing contamination.

J. T. Holah from Campden and Chorleywood Food Research Association in Gloucestershire presented a study of dry cleaning techniques, which are beginning to replace wet cleaning techniques in the production of ready-to-eat products. J.T. assessed the cleaning efficacy of compressed air, brushing and vacuuming using a cleaning rig. The spread of particles by compressed air was greater than with brushing or vacuuming, and the use of vacuum and brushing had better results than vacuuming alone.

Nigel Cook of the Central Science Laboratory in York, UK presented two studies involving PCR-based detection methods. The first study used a PCR assay for *Listeria monocytogenes*, which was found to be at least as sensitive as the ISO-based method and could be completed in 48 hours compared to the 5–10 days required for the traditional method. Nigel's second presentation discussed internal amplification controls (IACs) for use in PCR-based methods. Their laboratory constructed IACs for (RT) PCR-based detection of *Listeria monocytogenes*, Mycobacterium and norovirus.

Wei Zhang of Pennsylvania State University discussed the development of a multivirulencelocus sequence typing (MVLST) approach that used *Listeria monocytogenes* as a model foodborne pathogen. Wei concluded that MVLST improves the discriminatory ability of multilocus sequence typing (MLST) for subtyping *L. monocytogenes* and can be used for subtyping other bacterial genera and species.

T03– Foods of Animal Origin

Derrick O. Okull, Pennsylvania State University and Dharmendrasingh Pawar, University of Georgia

Rodriguez Lazaro discussed an RT-PCR assay for the detection of *Mycobacterium avium* subsp. *paratuberculosis* (MAP). The sensitive, specific test can potentially be used to detect as little as 100 cells/20ml in milk and water samples. It also has potential applications in other food products, but is disadvantaged because dead cells can also be amplified, thus leading to false positives.

The presence of bovine components in animal feed is believed to be largely responsible for the development of BSE in livestock. Marta Prado discussed the detection of cattle species in foodstuffs using a PCR-based method utilizing a fragment of the bovine-specific *cytb* gene to develop primers which allow the amplification of a115bp region of the gene. The highly specific and sensitive assay enables direct identification of bovine species in foodstuffs.

Douglas Smith explored the effect of fecal contamination and immersion chilling on *E. coli*, Coliform, *Campylobacter*, and *Salmonella* counts of broiler carcasses. Immersion chilling may equilibrate counts between contaminated and non-contaminated broilers in the same chiller, and minimize differences in counts on carcasses between non-contaminated and contaminated chillers.

L. Victor Cook presented a survey of *Salmonella* spp. and *Listeria monocytogenes* in raw liquid egg products in federally inspected processing establishments. *Salmonella* spp., especially serotypes *S.* Heidelberg and *S.* Enteritidis, were the most predominant.

Joshua Gurtler discussed the effects of pre- and post-cooling treatments on CO_2 cryogenically cooled table eggs inoculated with *S.* Enteritidis. In CO_2 cryogenically cooled eggs, no current processing methods would encourage *S.* Enteritidis growth above that in unprocessed, untreated eggs.

Luis Vivas compared the hygiene performance of two cattle abattoirs based on antimicrobial counts on hides and on dressed carcasses. The relationship between microbial populations on hides and resultant carcasses may compare abattoirs better than one based on carcasses only.

Spring M. Younts-Dahl presented three papers on the prevalence and reduction of *E. coli* among finishing beef steers fed with cotton-seed, a *Lactobacillus*-based direct fed microbial, and different doses of a *Lactobacillus acidophilus* direct fed microbial. Cotton-seed feeding did not lower *E. coli* prevalence, while the *Lactobacillus*-based direct feeding lowered *E. coli* shedding. A higher dose of *Lactobacillus acidophilus* caused the greatest decreases in *E. coli* shedding over time.

Kyle Dahl outlined the potential legal ramifications developing pre-harvest food safety interventions in the beef industry. The cost and effectiveness of interventions, validity of lawsuits under federal law, and difficulties in proving a causal link to the plaintiff's injuries may limit the success of any claims. The development of pre-harvest food safety interventions may not have a major impact on increased regulation or liability for producers.

David Smith assessed the distribution, elimination and metabolism of dietary sodium chlorate in beef cattle. Sodium chlorate may be a viable tool for pre-harvest pathogen elimination provided the chloride ion is the major chlorate metabolite present in edible tissues.

Ann Marie McNamara compared rapid test methods and discussed the validation of composite sampling to detect *E. coli* O157:H7 in raw beef trims and raw ground beef. Sensitivity of detection depended on the method used. The results could assist industry in correctly choosing a rapid test kit, incubation time and composite size to reliably detect O157:H7 in beef products and design testing protocols.

T04 – Education

Richelle Beverly, Louisiana State University and Katija Blaine, University of Guelph

The technical session on education was convened by Patrick Krakar and Xiangwu Nou highlighted. The presentations highlighted topics concerning: food safety, hazard analysis, and personal hygiene and consumer practices.

Alan Tart of the Food and Drug Administration, Atlanta, GA discussed the "Managing Food Safety: USDFA HACCP Guides for Operators and Regulators of Retail and Food Service Establishments." "This presentation involved the synopsis of how the regulatory agencies, retail and food service operators have drafted a plan to reduce the incidences of foodborne illness."

LeAnne Ellis of the University of Wales Institute Carduff, Carduff, UK did a study entitled "Evaluation of Novel Information Resources to Assist SMEs and Microbusinesses in Hazard Analysis." This study found that small, medium and microbusisnesses felt that resources that were jargon-free aided in the improvement of food safety management practices.

"Grower and Farm Worker Surveys Highlight the Need for Personal Hygiene Training Programs," was the talked presented by Elizabeth Bihn of Cornell University, Ithaca, NY. Elizabeth discussed that the farmers provide toilets to their field worker most of the time and did not provide the hand-washing facilities or needed training to the workers. The training is needed due to the fact that most workers are immigrant workers that read little English and illustrations aid to properly understand of what is expected. The surveys also pointed out that more growers need to provide more toilets, hand-washing facilities and training all the time.

The "Secret Shopper: Grocery Store Employee Food Handling Practices form a Customer's Perspective," was given by Lisa Mathiasen of the University of Guelph, Guelph, ON, Canada. Trained secret shoppers visited various grocers and observed the food handling practices. It was discovered that despite training, there was improper glove usage, poor employee hygiene and areas for cross contamination between ready-to-eat products and raw products.

"An Evaluation of Food Safety Information Transfer to Employees: One-page Media Summary Sheets in Food Service and Agriculture," was discussed by Benjamin Chapman of the University of Guelph, Guelph, ON, Canada. The one-page sheets compiled by the Food Safety Network (FSN), done in English and Spanish, were posted in break areas and employee areas. The sheets written on a consumer level were a tool for businesses to help train employees about the importance of food safety.

Sandra Poirier and Thamir Alnajjar of Zayed University, Dubai, United Arab Emirates discussed the "Food Safety Education in the United Arab Emirates." Due to increase international trade and increased food safety practices, a new program, United Arab Emirates International Food Safety and Sanitation Professional Development Program, trainings employees in food safety and sanitation practices. It also provides technical writings, research and presentation skills for Dubai's food and hospitality sectors.

"The Design and Evaluation of Food Safety Messages and Media for Canadian Restaurant Take-out Consumers," was presented by Brae Surgeoner. The study pointed out that consumers are concern about the safety of take-out food and want information on how to improve safe handling. A sticker study illustrated consumer changing awareness of safe handling practices.

Sheryl Cates of RTI International Triangle Park, NC presented the "Handling and Storage Practices for Frankfurters, Deli Meats and Deli Salads: Results of a Consumer Survey". The survey showed that consumers are not aware of *Listeria monocytogenes* and that there is a need for the development of risk communication materials targeted to consumers.

Highlights of the Executive Board Meeting

August 6–12, 2004

Following is an unofficial summary of actions from the Executive Board Meeting held at the J.W. Marriott Desert Ridge Resort on August 6–12, 2004:

Approved the following:

- Minutes of April 28–30, 2004 Executive Board Meeting
- Issuance of Affiliate Charter to Arizona Environmental Health Association
- Change of Committee name for Committee on Communicable Diseases Affecting Man to Committee on Control of Foodborne Illness
- Foundation Fund vision statement

Discussed the following:

- E-mail votes taken since the last meeting
- Board responsibilities at various Annual Meeting functions
- Possible new Affiliate organizations
- Affiliate organizations not in compliance with IAFP Bylaws
- 3-A Sanitary Standards, Inc. update
- World Health Organization – Non-Governmental Organization
- Working together with ILSI Europe to hold a workshop in Europe
- Restructure of Awards Criteria
- Released restriction on contribution to IAFP Foundation
- Code of Ethics assigned to Past Presidents' Committee
- A review of IAFP 2004
- Committee recommendations

Reports received:

- *Food Protection Trends*
- *Journal of Food Protection*
- IAFP Web Site
- Membership update
- Advertising update
- Financial statements for period ending June 30, 2004
- Board Members attending Affiliate meetings
- Affiliate Newsletter
- Future Annual Meetings
- Co-sponsorships
- Exhibiting (IAFP On the Road)
- Future Board meeting dates

Next Executive Board meeting: November 15, 2004

Minutes of the 91st Annual Business Meeting

August 10, 2004
Phoenix, Arizona

President-Elect Kathy Glass welcomed attendees and introduced President Paul Hall.

Moment of Silence

President Paul Hall asked those present to observe a moment of silence in memory of departed colleagues.

Call to Order

The Annual Business Meeting of the International Association for Food Protection was called to order at 4:47 p.m. at the JW Marriott Desert Ridge Resort in Phoenix, Arizona. A quorum was present as defined by the IAFP Constitution.

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

Minutes

Minutes from the IAFP 90th Annual Business Meeting were approved, as they appeared in the November 2003 *Food Protection Trends*. The motion was made by Jack Guzewich and seconded by Michael Brodsky.

President's Report

President Paul Hall reported on programs and activities of IAFP over the past year. He reported that a group met to explore forming a Membership Committee to assist with membership growth. A meeting was also held to form a Food Toxicology and Food Allergens PDG. Ed Zottola was selected as the Scientific Editor of *Food Protection Trends* with John Cerveny serving as interim Editor during the selection process, and *FPT* manuscript submissions were down last year. The *Journal of Food Protection* received 80% of its manuscript submissions online. *JFP* Online now has over 700 users, including 60 institutional subscribers, and the use of online membership renewal and online Annual Meeting registrations increased over the prior year. Paul noted that two new awards, the Presidential Lifetime Achievement Award and the John H. Silliker Lecture Award would be presented at the Awards Banquet. The Student PDG involvement continues to grow at the meeting with the first Student Mixer to be held this year. IAFP 2004's program included 6 concurrent sessions, record attendance with over 1,550 attendees, 128 exhibit booths, a 20% increase in sponsorships, and 3 workshops were held this year.

President Hall then presented an Affiliate Charter to David Ludwig and Christopher Reimus who accepted it on behalf of the Arizona Environmental Health Association.

Tellers Committee Report

Mark Carter, Teller, reported there were 725 votes received, with 8 being illegal. Gary Acuff was elected as Secretary for the 2004–2005 year. A motion by Bob Sanders and seconded by LeeAnne Jackson to accept the report and destroy the ballots was approved.

***JFP* Management Committee Report**

Chairperson Roger Cook reported that a record number of manuscripts were submitted in 2003; *JFP* Online subscriptions had increased and he noted it was felt membership renewal forms need to offer a clear method for selecting *JFP* Online over the print version. The Journal will be publishing three supplements that should be monitored to ensure they do not interfere with other manuscripts being published. He noted that an author response to a Letter to the Editor was 15 pages in length when received and that guidelines should be developed to limit response length. An issue of financial disclosure was discussed regarding a manuscript where it was not clear that the authors worked for the company that supported the research. He noted that the Committee asked staff to investigate the financial implications of implementing online reviews. Roger thanked the staff and the Scientific Editors for their hard work and noted that Mike Davidson had agreed to another 4-year term. It was also recommended that Board consider adding another Scientific Editor due to increased manuscript submissions.

***FPT* Management Committee Report**

Fred Weber reported 23 people were in attendance at the *Food Protection Trends* Committee Meeting. The Committee welcomed David Golden as Vice Chair of the Committee. There were no "Thoughts on Food Safety" articles published in 2003, a policy for handling articles of a sensitive nature was developed, and the 2002 and 2003 ILSI Symposia will be published in *FPT*. Fred noted that articles containing opinions should be included in

"Thoughts on Food Safety," and a request for readership input will be published. The Committee will recommend establishing a system for online manuscript submissions for *FPT*, investigation of the cost of *FPT* to be carried by an index service, publication of full-length articles online, and to include an Editor's Musings section in *FPT*. Ed Zottola was welcomed as Scientific Editor.

Foundation Fund Report

Gale Prince reported there were 70 submissions to the Developing Scientist competition this year and that the Ivan Parkin Lecture continues to be supported by the Fund. He noted the Committee is looking at how to get people involved, to recognize contributors, and to expand the speaker fund to assist Annual Meeting speakers with their travel expenses. He indicated the Committee recommended 10% of the projected annual Foundation revenue be allocated to support speakers. New Members have been added to the Committee, which now numbers 12. The Committee recommends that terms on the committee be increased from 2-years to 3-year terms. This change to the term will need to be reflected in the Bylaws.

Gale announced that over $4,600 was raised through this year's Silent Auction. Upon conclusion of his report, a very creative presentation of a $1,000 check for the Foundation Fund by members of the Florida Association for Food Protection was made. The presentation incorporated a skit highlighting the summer Olympics being held in Greece but with a food safety twist.

Affiliate Council Report

Steve Murphy reported there were 43 in attendance at the Committee Meeting, 26 Affiliates represented, and there are now 40 Affiliates. An informational breakfast meeting was held with 45 people in attendance from Japan, Australia, New Zealand and Thailand to explore forming new Affiliate organizations in those countries. The Council recommended that Affiliate Meeting speakers submit their presentations to the IAFP office for publication in *FPT*. Steve requested Affiliate officers and members to submit pictures from their meetings to the IAFP office so that a PowerPoint presentation can be assembled for showing at next year's Annual Meeting in Baltimore.

Executive Director's Report

David Tharp reported on the financial condition of the Association and stated that for the first time in more than 15 years, as of August 31, 2003 the Association's General Operating Fund carried a positive fund balance into the current fiscal year. The balance stood at $28,000 at September 1, 2003. He further explained that there has never been a cash flow problem at any time during the prior years; the Association has always been able to pay its obligations timely. David further explained that holding a negative General Fund balance meant that if the Association were to discontinue as a business entity, full payment of its debt to vendors and Members would not be possible. In addition, it was pointed out that for an Association that has been around as long as IAFP (more than 90 years), it was unacceptable to hold a negative General Operating Fund balance.

Besides the news of finally reaching the goal of a positive General Fund balance, David told that this current fiscal year looks to be a record-breaking income year for the Association. Financial results for the year ending August 31, 2004 will not be available until completion of the audit that will be presented to the Executive Board in early November. Expenses have been held in check during the year and with the financial success of IAFP 2004; David was optimistic that the General Fund balance is headed in the right direction.

David thanked the IAFP staff for their hard work and perseverance. It takes many hours of extra effort and lots of dedication for the staff of 10 to organize IAFP's Annual Meeting. David Ludwig, Aimee Upton and Chris Reimus organized the Local Arrangements Committee (LAC) from our newest Affiliate, the Arizona Environmental Health Association (AEHA). David Tharp recognized the work put forth by AEHA and the LAC Chairs. Lastly, David thanked the Executive Board for their support of him and the IAFP staff over the past year.

Unfinished Business

A tabled Bylaws Amendment from the 2003 Business Meeting was brought off the table with a motion from Jack Guzewich and a second from Kathleen Rajkowski.

A motion was made by Anna Lammerding and seconded by Fred Weber to accept the Amendment as tabled last year. Discussion of the motion was held. Constitution and Bylaws Committee Chair Ron Case explained that, during the Committee's discussion, they arrived at a recommendation that the amendment is not necessary for inclusion in the Bylaws. A vote was taken and the motion failed.

New Business

Past President Anna Lammerding presented David Tharp with the "Nascow Stockyard Cow," a miniature version of the cow from CowParade™ held in cities around the USA. No new business was brought before the Annual Business Meeting.

Adjournment

President Hall adjourned the meeting at 5:53 p.m.
Respectively Submitted,
Frank Yiannas, Secretary

Committee Minutes

IAFP 2004—August 8–11, 2004
Held at the JW Marriott Desert Ridge Resort
Phoenix, Arizona

STANDING COMMITTEES

Food Protection Trends Management Committee

Members Present: Fred Weber (Chairperson), David Golden (Vice Chairperson), Ed Zottola (Scientific Editor), Roger Cook, *JFP* Chairperson, Alfred Fain, Leon Gorris, Judy Greig, Mariza Landgraf, Joseph Meyer, Peter Slade, Gloria Swick-Brown, Alex Von Holy, Chris Newcomer and Edward Wellmeyer.

Members Absent: Steve Berry, Carl Custer, Dan Erickson, Gisele LaPointe, Thomas McCaskey, and Richard Whiting.

Board Members and IAFP Staff Present: Paul Hall, Kathy Glass, Jeff Farber, Donna Bahun, David Tharp, and Lisa Hovey.

Guests: John Cerveny, LeeAnne Jackson, Elizabeth Johnson, John Sofos, Edward Wellmeyer, Donna Christensen, and Maria Teresa Destro.

Meeting Call to Order: 2:06 p.m.

Recording Secretary of Minutes: David Golden.

Introduction of David Golden as Committee Vice Chairperson.

Welcome to new committee members – thanks to departing members.

Weber offered his appreciation to the outgoing members, and introduced the new members.

Additions/Modifications to Agenda and Approval: No new additions or modifications to the agenda were offered.

Approval of Minutes from 2003 Meeting: Fain moved to accept, second by Swick-Brown, approved by members.

Executive Board Report: Paul Hall noted that the Association had been very busy and successful during the past 12 months. Membership has remained stable. Exploring new membership committee with charge of seeking ideas and ways to increase membership. Increase in Gold and Silver Sustaining members. Paul expressed thanks to Gold and Silver members for their support. Some highlights: 611 papers submitted to *JFP*; *JFP* accepted online submissions 2003; 700 subscribers to *JFP* online, no significant drop in hard copy subscriptions; Paul noted significant activity on web (20,000 hits) to web site, including online submissions to *JFP*, meeting registration, etc. Martin Cole will deliver the Ivan Parkin Lecture; Merle Pierson speaking in Plenary Session. New lectureship – John H. Silliker Lectureship, Bruce Tompkin is the speaker. Increase in exhibit hall booths. 20% increase in sponsorship, 3 workshops this year. Student PDG is growing and doing well. Executive Board held strategic planning conference during Spring meeting to look at future direction of the Association over the next 10 years, and developed strategic plan. This will be disclosed later.

Executive Director Report: David Tharp thanked Donna Bahun for *FTP* assistance as Production Editor. David indicated a slight increase in attendance at this year's annual meeting; reiterated some of the increases in support as mentioned by Paul. Noted that the Association is in a positive financial situation, running ahead of budget so far this year, and anticipated good results from the annual meeting. Expressed appreciation to committee for their efforts.

Scientific Editor Report: Ed Zottola started this job in May and still getting familiar with the position. He thanked John Cerveny for serving as Interim Editor prior to Ed's appointment. Distributed report. Expressed frustration in not getting reviews back in timely fashion from some reviewers. Toyed with idea of establishing an editors column. Invite readers to submit a problem that they encountered in their jobs, and how the problem was solved. Hoped that this information would be beneficial to others.

Peter Slade asked Ed if there was need for a disclaimer regarding the advice column. Ed indicated that the name of submitter was not necessarily needed, but asked for comments. David Tharp noted that a disclaimer does exist for articles, and noted that some sort of disclaimer may be needed.

Fred Weber reiterated that submissions were down, and that this needs to be addressed.

Production Editor Report: Donna Bahun reported that submissions were down and that we had been publishing 3-4 papers per month from backlog, but due to low submissions, need to reduce this number to around two per issue, which would carry *FPT* through the October issue. Only 19 papers have been submitted to *FPT* in 2004, as compared with 33, 39, and 46 in 2001, 2002, and 2003, respectively. No Thoughts on Food Safety columns have printed this year and the Career Services Section is low, running only one ad every couple of months. Donna thanked John Cerveny for filling in as interim scientific editor and is looking forward to working with Ed Zottola.

Old Business:

Status of 2003 Recommendations to the Executive Board: Regarding the recommendation for a policy for evaluation of manuscripts that impact food safety and security, the Board agreed with recommendation. Board asked *FPT* and *JFP* Scientific Editors along with the chairperson and vice chairperson of both committees to prepare a policy addressing review of articles dealing with sensitive subject matters such as bioterrorism and homeland security for board review and acceptance as soon as possible. Weber asked the staff how this policy is disseminated to prospective authors. Tharp noted that it is not a published policy, but is an internal document for Board. LeeAnne Jackson asked if such manuscripts should also be given to others with similar experience to that of submitting author, in addition to the Editors of *JFP*, and it was noted that this practice is used if necessary.

Policy for evaluating manuscripts: Specifically with regard to articles of a sensitive nature, Weber noted that different organizations have struggled with this issue, considering the concern for censorship vs. public protection. He noted that ASM is dealing with a similar situation. John Sofos, pointed out that *JFP* also has instructions to reviewers to be alert to manuscripts that may contain material of a sensitive nature.

Status of 2002 Recommendations to Executive Board. There were thoughts about the possibility of publishing selected *FPT* articles in non-English languages, and if so, what language? Slade suggested publishing only the abstract in English and the other language, with the full text available on the IAFP Web site. Zottola commented that from a practical standpoint, it could be difficult to get the translation – would require bilingual translaters. Bahun pointed out that we have typically asked our members to assist with some translation issues, but that a problem of this magnitude (full articles) would be beyond the ability to get membership assistance. Zottola noted the predominate target readership can read English, and that the need to translate abstracts and articles may not exist. Hall agreed that there may not be a need for such an effort. Mariza Landgraf, from Brazil, pointed out an IAFP document had been translated by someone into poor Portugese, and it was represented as an IAFP document. This could create misperceptions, and again, may not be needed for readership.

Request to publish certain ILSI and other symposium abstracts in *FPT*. Bahun stated that 2002 and 2003 abstracts will be published in the near future.

Thoughts on Food Safety Column Report: How to increase submitted columns – A subcommittee was tasked to come up with topics and solicit authors. Weber noted that opinion columns may be rolled into this column and noted that such a column is a good idea. He also pointed out that the readership has indicated great interest in such a column, and it should be continued. Topics chosen are selected by the subcommittee – recommendation that others outside the subcommittee be allowed to submit. Should we put out a call for submissions? Hall suggested that you may need a combination approach – open up to readership but also still rely on recommendation for topics from the sub-committee. Golden suggested using symposium presentations that particularly stand out as potential topics, and solicit column submissions from the presenters. Zottola pointed out that there are a number of posters that may be likely sources for submissions. He asked that committee members watch out for potential topics presented at the annual meeting, bring it to his attention, and he would contact the author to solicit a column. Gorris called for wording of a recommendation to the Executive Board to include a hot topic or immediate interest to the food industry. John Cerveny suggested that a recommendation be made to expand the concept of the column to include Food Quality thoughts. It was further discussed that the recommendation should state that solicitations for the article be both invited and solicited via requests from the Scientific Editor to readership. Motion to make recommendation to board (Gorris; Meyer second, unanimous acceptance by vote).

Status of Manuscript Submissions: Submissions are down. Bahun noted that this seems to be a trend every couple of years in which submissions increase and then decrease. Weber suggested that the online

submission opportunity for submitting to *JFP* is a likely reason for the increase in *JFP* submissions, and asked if it would be possible to accept online submissions for *FPT*. A recommendation was made for the Executive Board to consider implementing online submissions for *FPT*. (Swick-Brown, motion; Greig second, unanimous vote by committee.)

Zottola proposed an Editor's column for *FPT*, and plans to explore this option and consider title for the column (e.g., Editor's Musings; Lessons Learned, etc.). Gorris asked about the current time line, from submission to acceptance. He suggested that working to shorten the process might increase submissions. Bahun and Zottola noted that reviewers' timeliness also affects time line. Weber suggested that online review of articles is inevitable, and adopting online review would also help to expedite publications. It was suggested that the Staff look into the cost of having *FPT* carried by Pub Med or similar service. This might increase an author's likelihood to submit to *FPT*, since impact factor is an important consideration for submitting articles to journals. Gorris suggested that the entire article be published on the web, and not just the abstract, as is the current practice. Gorris moved to recommend to the Board that it be made possible to download full articles from *FPT* (Greig second; carried unanimously). John Sofos pointed out that all IAFP members get *FPT* free, and that making the article downloadable should not represent a negative financial impact. Swick-Brown commended Bahun on her selection of photos used on the cover of *FPT*.

New Business: Appointment of Ed Zottola for 4-year term as Scientific Editor. Fred distributed notes on the resignation of Bill LaGrange and announced the appointment of Ed Zottola as new scientific editor. Recommendation to Executive Board to confirm Ed's appointment to 4-year term as *FPT* Scientific Editor (Meyer motion; Swick-Brown second; approved unanimously).

Recommendations to the Executive Board:

1. To expand the concept of the "Thoughts on Food Safety" column to include Food Quality thoughts, i.e., "Thoughts on Food Quality and Safety."
2. Solicitations for "Thoughts on Food Quality and Safety" should be both invited and solicited via requests from the Scientific Editor to readership.
3. To consider implementing accommodations to accept online submission of papers for publication in *FPT*.
4. That it be made possible for the membership to download full articles from *FPT* from the IAFP Web site.
5. To confirm Ed Zottola's appointment to 4-year term as *FPT* Scientific Editor.

Final Comments: Weber again thanked John Cerveny for serving as interim Scientific Editor for almost four months. Weber reviewed the recommended change in Instructions to Authors regarding length of opinion-based submissions. Zottola recommended adding language to restrict the length of submitted articles to 30 double-spaced, typewritten pages, including references.

Next Meeting Date: August 14, 2005, Baltimore, MD.

Meeting Adjourned: 4:02 p.m.

Chairperson: Fred Weber.

Journal of Food Protection Management Committee

Members Present: Roger Cook (Chairperson), Isabel Walls (Past Chairperson), Maria Teresa Destro (Vice Chairperson Elect), John Sofos (Scientific Editor), Michael Davidson (Scientific Editor), Joseph Frank (Scientific Editor), Fred Weber (*FPT* Chairperson), Morris Potter, Lone Gram, Mark Moorman, Payton Pruett, Eric Johnson, Tina Pedroso, Elliot Ryser and Scott Burnett.

Members Absent: David Acheson, Judy Fraser-Heaps, Jennylynd James, Randall Phebus, and Marian Wachtel.

Board Members and IAFP Staff Present: Paul Hall, Kathy Glass, Jeff Farber, Gary Acuff, Anna Lammerding, David Tharp, Lisa Hovey, Bev Brannen, and Didi Loynachan.

Guests Present: Jack Guzewich and Larry Beuchat.

Leaving: Mindy Brashears, Warren Dorsa, Melissa Newman, Greg Siragusa, and Isabel Walls.

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

Introductions: The committee welcomed Scott Burnett, Eric Johnson, and Tina Pedroso, and later Morris Potter, to the committee. Committee thanked departing members Mindy Brashears, Warren Dorsa, Melissa Newman, Greg Siragusa, and Isabel Walls.

Committee and President recorded a vote of thanks to Isabel Walls for a magnificent job as Chairperson, and for her preceding work on the committee.

Recording Secretary of Minutes: Isabel Walls.

Old Business: Minutes of 2003 meeting were reviewed and Approved (Farber/Pedroso).

Issues arising:

1. Provision of complementary PDF files to authors. Board considered the cost to IAFP not acceptable at present but would revisit in the future.
2. Submitted papers with food security concerns. Board developed policy that entails decision by scientific editors with escalation to the Board if concerned. Amendment to Instructions for Authors.
3. John Sofos accepted as Scientific Editor for another 4 years.

New Business:

Amendments to agenda (Farber/Pruett):

Added discussion on acceptable length of responses to Letter to the Editor (Frank).

Added discussion on changes to scope to enable immediate rejection of quality papers without context of food safety (Davidson).

Added discussion on provision of online review of papers (Frank).

Added discussion on quality of figures submitted for publication.

Added statement with regard to acceptance of papers from trade-restricted countries.

Report from IAFP President: Paul Hall provided an update of activities in 2003-04.

Report from IAFP Office: David Tharp provided an update of activities in 2003-04.

Report from *JFP* Scientific Co-Editors: Joseph Frank presented a report of activities in 2003 and 2004 to-date. Volume 66 (2003) contained 376 more pages and 49 more articles that volume 65. This is reflecting heavily in the Editor workloads. More importantly, 73% and 93% of articles were published within 10 and 12 months respectively, which is reflected well in the high standing to which the journal is now held (2003 Journal Citation Report). The backlog is now optimal at 2.13 issues compared to 2.47 in 2002. 2004 (volume 67) is on track to be another record year.

International authors provided 47.1% of submitted papers with Spain and Canada fighting it out for the most papers submitted. Although 11 new reviewers were added to the editorial board in 2003, the Committee was asked to encourage more international members.

The Scientific Editors noted that papers thought to be more suitable to *FPT* are recommended for diversion at the earliest possible time in the review process.

The Committee offered thanks to the Scientific Editors and the Editorial Board for a job well done in the face of the increased numbers of submitted papers.

Report from Administrative Editor: Bev Brannen reported:

Electronic publishing is on track with no issues of concern.

Subscription to *JFP* Online continues to increase with 652 individual members and 61 institutional members signed up without a noticeable decrease in subscriptions to the print version. The Administrative Editor was asked to provide more detailed statistics on web use. There was agreement that the online procedure for selecting "Online only" was unclear, and that clarification was required on the web-site. A possible adverse effect on subscription income was noted.

Three supplements to the journal have been accepted and are working through the publication process. It was noted the supplements were placing some stress on the system and it was agreed that the Management Committee would (1) be aware of the implications of accepting each supplement, (2) monitor the publication process to ensure that publication of contributed papers is not compromised, and (3) develop specific guidelines for publication of supplements would be developed and submitted to the Board.

Page charges were not increase although subscription and membership rates would increase.

Further Business: Maria Teresa Destro (Brazil) was elected as the Vice Chairperson.

Scientific Editor: It was agreed that the term for Michael Davidson be extended for a further 4 years.

Letters to the Editor: It was reported that the journal had received a 15 page response to two Letters to the Editor. Because the response was scientifically robust, justified and met current Instructions for Authors, and that such responses are rare, it was agreed to publish the response without further page charges. However, it was agreed that the Management Committee would develop new guidelines for the Instructions for Authors to limit the length of such responses (e.g., 5 double-spaced pages, extended only with permission of the Scientific Editors).

Financial Disclosures: An issue was raised and discussed with regard to authors of papers describing or comparing commercial test kits failing to indicate a commercial link to the described kit. It was agreed that the current policy and Instructions for Authors are adequate.

Online Review of Papers: Following the success of online submission of papers to *JFP*, the advantages and disadvantages of online review of manuscripts was discussed at length. It was acknowledged that initial indications of high cost may now be out of date.

Food Quality Papers: The Committee agreed that while the current scope of *JFP* allows the submission of food quality papers without any "food protection" context, such papers were outside the intended scope of the journal.

Publication of Figures: The Committee agreed that the instructions to authors be amended to improve guidance for submission, especially electronic submission, of figures.

Non-trade Countries: The Committee was updated on the previous possibility of a legal prohibition on copy editing, hence accepting, papers from countries for which there is a trade ban. Fortunately, this legal prohibition never eventuated.

Scientific Editors: The Committee noted that the increase in number of submitted papers and acceptance of specific symposia [supplement sections], had substantially increased the workload of the Scientific Editors. Any "inevitable" increase in the number of submitted papers would deem the workload unacceptable.

Recommendations to the Board:

1. That the instructions for selection of subscription solely to *JFP* Online be clarified.
2. That approval be granted for extension of the term for Michael Davidson as Scientific Editor for a further 4 years.
3. That the practicality and financial implications of contemporary systems for online review of papers be re-evaluated.
4. That the scope of *JFP* be amended to discourage papers without a "food protection" context.
5. That a 4th Scientific Editor be appointed, noting that a recent selection process for *FPT* had turned up several excellent candidates.

Next Meeting Date: August 14, 2005, Baltimore, MD.

Meeting Adjourned: 12:07 p.m.

Chairperson: Roger Cook.

Program Committee

Members Present: Gary Acuff, Catherine Donnelly, Vickie Lewandowski, Emilio Esteban, Faye Feldstein, Margaret Hardin, Tim Jackson, Lee-Ann Jaykus, Indaue Mello, Ron Schmidt, and Don Zink.

Members Absent: Alejandro Castillo, Gordon Greer, and Shelagh McDonagh.

Board Members/Staff Present: Paul Hall, Kathy Glass, Jeff Farber, David Tharp, and Bev Brannen.

Guests: Over 10 guests attended the meeting.

Meeting Called to Order: 4:00 p.m.

Recording Secretary of Minutes: Catherine Donnelly.

Summary of Activities and Actions Taken:

Gary Acuff and Gordon Greer will be leaving the Committee at the conclusion of IAFP 2004. On behalf of the Program Committee, we want to thank them for their contributions during their term. Their efforts were, in part, responsible for the successful programs presented at the Annual Meetings, and we truly appreciate all their hard work and dedication.

Members who will join the committee this year are: Lee-Ann Jaykus and Don Zink. Vickie Lewandowski will serve as Vice Chairperson for IAFP 2005 and will become Chairperson for IAFP 2006 in Calgary, Alberta, Canada.

The committee reviewed symposia and workshops proposed for IAFP 2005. Further review of all symposia will be made at the Wednesday meeting.

Summary of Program Committee Meeting, Wednesday, August 11:

Members Present: Catherine Donnelly, Emilio Esteban, Faye Feldstein, Margaret Hardin, Tim Jackson, Vickie Lewandowski, Lee-Ann Jaykus, Indaue Mello, Ron Schmidt, and Don Zink.

Members Absent: Alejandro Castillo and Shelagh McDonagh.

Board/Staff Present: Paul Hall, Kathy Glass, Jeff Farber, and Bev Brannen.

Meeting called to order: 12:30 p.m.

The committee reviewed 50 proposed symposia. After detailed discussions, 16 proposals were rejected and 8 were recommended to be combined with other proposals. Total accepted symposia were 26. Letters will be sent out to the organizers with instructions to finalize their submissions. Final acceptance will be made at the January meeting.

The committee reviewed six workshop proposals. Four workshops were accepted for further development. Three workshops will be in conjunction with IAFP 2005 and one will be developed as an off-site workshop. The remaining two workshops were rejected.

Recommendations to the Board: None.

Next Meeting Date: January 21–22, 2005, Baltimore, MD.

Chairperson: Catherine Donnelly.

SPECIAL COMMITTEES

AWARDS COMMITTEE

Members Present: Steven Murphy, Stephanie Olmstead, and Eugene Frey.

New Members: Randy Daggs.

Meeting Called to Order: 10:15 a.m.

Recording of Minutes: Eugene Frey.

Old Business: None. Reviewed the past year's selection process.

New Business: We discussed the need to review the qualifications needed for IAFP Awards to bring current relevance to the selection process. Do some of the required selective criteria exclude some highly qualified candidates?

Recommendations to Executive Board: None at this time, but may have suggestions during this current year, prior to awards selection process in early 2005.

Next Meeting Date: August 14, 2005, Baltimore, MD.

Chairperson: Eugene Frey.

3-A Committee on Sanitary Procedures

Members Present: Helen Piotter, Vice Chair, Phil Wolff, Ron Schmidt, and Steve Sims.

Others Present: Tim Rugh, Allen Sayler, Joe Smucker, Ken Anderson, Dan Erickson, David Fry, and Todd Cline.

Meeting Called to Order: 10:15 a.m.

Tim Rugh, 3-A SSI, presented overview of new 3-A format for guests present.

Helen Piotter presented notes from IAFP Executive Board regarding symposia, booklets topics and formation of new PDG on food allergens and toxicology.

Symposia for IAFP 2005 were discussed. Two symposium proposals were developed including: Application of Materials for Multi-use Food Contact Surfaces and Testing and Evaluation of Multi-use Food Contact Surfaces for Cleanability.

A motion was made and approved to forward the proposals to the program committee.

Discussion was held about getting a presenter for the May 2005 3-A meeting on the topic of Ceramics as a food contact surface.

The members discussed developing a booklet pertaining to a resource guide for cleanability of food equipment. A motion was made and approved that at next year's IAFP 3-A CSP meeting, the primary topic of discussion will be the development of a booklet of resources of cleanability information.

A special meeting to discuss changes to the Model Document was discussed. The meeting will be held on August 9, 2004, 8:00 a.m. to 10:00 a.m.

Steve Sims presented ideas for alternatives to face to face meetings for sanitarians to discuss 3-A documents being considered for vote in working groups and by the consensus group. Tim Rugh agreed to research internet bulletin board and other options.

A motion was made and approved that options be pursued for web-based communication on draft documents for CSP.

Tim Rugh indicated that an index is being developed that will post and archive opinions and interpretations already accepted by 3-A groups.

Ron Schmidt announced that he and Dan Erickson co-authored new informative documents available through the University of Florida Cooperative Extension on sanitary design and construction of food processing and handling facilities and sanitary design and construction of food processing equipment.

Next Meeting Date: August 14, 2005, Baltimore, MD.

Meeting Adjourned: 12:20 p.m.

Audiovisual Library Committee

Members Present: Purnendu Vasavada, Bernadette Franco, Dorothy Wrigley, Howard Malberg, Joseph Iwan, Cindy Roberts, Bob Sanders, Warren Clark, Tom McCaskey, and Bob Marshall.

New Members: Xiangwu Nau.

Board Members and IAFP Staff Present: Jeff Farber, Anna Lammerding, and Lucia McPhedran.

Meeting Called to Order: 1:12 p.m.

Recording Secretary of Minutes: Dorothy Wrigley.

Old Business:

1. Review of library acquisitions since last meeting of new materials and 3 copies for video with high demand. New $1,592.50, 8 free $830.84 for additional copies of frequently used tapes.
2. Executive Board approved use of survey on AV to members.
3. AV data sheet discussed.
4. Continuing need to add new members.
5. Link to NAL Web site from IAFP Web site made. Link could be made from Spanish video list to NAL's Spanish list.

New Business:

1. Budget discussed as provided.
2. Survey on AV needs to IAFP Members: include in FPT and individually to AV library users. Lucia will draft a survey and circulate to committee members. Items for survey include: topics desired to be included in the library, types of materials: CD, DVD, VHS/ Interactive, Languages needed, Individuals who could provide sources for non-English video, willing to serve as a member, use of AV library.
3. Long-range goal, voiceover of non-copyright material to convert to other languages
4. Evaluation, description of intended use: needs to be expanded, use some information from NAL.
5. Discussion on CD interactive courses for loan-term and usage.

Next Meeting Date: August 14, 2005, Baltimore, MD.

Meeting Adjourned: 3:00 p.m.

Chairperson: Tom McCaskey.

Committee on Communicable Diseases Affecting Man

Members Present: Ewen Todd, Bert Bartleson, Chris Griffith, Jack Guzewich, Faye Feldstein, Barry Michaels, Judy Greig, and Sabah Bidawid.

New Members: Marilyn Lee and Kristi Barlow.

Meeting Called to Order: 8:10 a.m.

Recording Secretary of Minutes: Bert Bartleson.

Old Business:

1. Discussed Symposium 2004 (Transfer and Spread of Pathogens in Food Environments) Convenors: Ewen Todd and Bert Bartleson.
2. Review and discuss draft paper "The Importance of the Infected Food Handler in Causing Foodborne Illness Outbreaks."
3. Committee Members Leaving Committee: Daniel Maxson.

New Business:

1. Discussion of a new name for the committee, five possible names were identified and discussed: (Committee for the Management of Foodborne Disease, Committee on Foodborne Disease, Committee on Communicable Disease, Manual Committee and Committee on the Control of Foodborne Illness).
2. Symposium for 2005 discussed. Title Foodborne Illness and Outbreaks – What Went Wrong? Six proposed speakers and topics were identified.
3. We discussed revising the manual, "Procedures to Investigate Foodborne Illness", 5th edition, 1999. We decided to begin the process next year and to incorporate adding a section on bioterrorism and changing the forms to electronic format if possible.

Recommendations to Executive Board:

1. We proposed that the new name for the committee be Committee on the Control of Foodborne Illness.
2. The draft paper [on food worker hygiene] was reviewed and the Committee will publish it in *FPT* or *JFP* in up to five parts beginning shortly with the first and second parts.
3. The Committee proposes to revise the manual beginning in 2005 [foodborne manual]. Sections on bioterrorism will be added as well as other needed additions and corrections.

Next Meeting Date: August 14, 2005, Baltimore, MD.

Meeting Adjourned: 5:36 p.m.

Chairperson: Ewen Todd.

Constitution and Bylaws Committee

Members Present: Ron Case (Chair), Zeb Blanton, Michael Brodsky, and Bob Sanders.

Board Members and IAFP Staff Present: David Tharp, Gary Acuff, and Didi Loynachan.

Meeting Called to Order: 3:05 p.m.

Recording Secretary of Minutes: Ron Case.

Old Business: Discussion of tabled changes from 90th IAFP Business Meeting. The Committee did not feel the changes were needed.

New Business: Selected David Fry as Vice Chairperson. Changes in Bylaws needed for 2005 meeting:

1. Add Membership Committee as Special Committee.
2. Add new Awards.

Recommendations to Executive Board:

1. Add Membership Committee as Special Committee, and add new Awards.
2. The Committee recommends the proposed changes that were tabled [at the 2003 IAFP Business Meeting] not be included in the IAFP Bylaws.

Next Meeting Date: August 14, 2005, Baltimore, MD.

Meeting Adjourned: 3:25 p.m.

Foundation Fund Committee

Members Present: Stan Bailey, Roger Cook, Bob Gravani, Peter Hibbard, Bob Marshall, Gale Prince, Susan Sumner, Fred Weber, Don Zink, and Wilbur Feagan.

Board Members and IAFP Staff Present: Paul Hall, Kathy Glass, Jeff Farber, Frank Yiannas, David Tharp, and Lisa Hovey.

Meeting Called to Order: 3:05 p.m.

Recording Secretary of Minutes: Susan Sumner.

Old Business:

1. Reviewed the annual expenditures of Foundation Fund.
2. Reviewed the Board actions on 2003 recommendations.
3. Gale Prince reported on subcommittee ideas to recognize foundation donors.

New Business:

1. Appointed a subcommittee to draft a vision statement for the Foundation Fund. Committee members encouraged provision of additional support to developing scientists and for assistance to international members, especially those of developing countries.
2. Current subcommittee will further develop an implementation plan to recognize foundation donors. Some suggestions for consideration follow:
   a. Provide for the name badge a ribbon entitled FOUNDATION FUND CONTRIBUTOR.
   b. Establish contribution levels and provide that they can be reached over time. Suggested titles: platinum, gold, silver, bronze, and pewter.
   c. Market the foundation during the opening session, the business meeting and the banquet.

Motions Made, Seconded and Passed:

1. Recommend the Executive Board explore the option to put Foundation funds into a separately managed account to increase yield.
2. Recommend that the budget line item for speaker travel be increased to 10% of projected revenue.
3. Recommend that Foundation Fund Member's term of appointment be changed in the IAFP Bylaws from 2-year to 3-year appointments.

Recommendations to the Executive Board:

1. That the funds from the Foundation be put into a separately managed account to increase yield.
2. The Committee recommends that the amount of speaker travel supported by the Foundation be increased to 10% of the Foundation's projected annual revenue.
3. The Committee recommends that the Foundation Fund Committee Member's term of appointment be changed from 2-years to 3-years.

Next Meeting Date: August 14, 2005, Baltimore, MD.

Meeting Adjourned: 5:00 p.m.

Chairperson: Bob Marshall.

Nominating Committee

The Nominating Committee met to discuss candidates to stand for election to become Secretary for 2005-2006. The committee will hold a conference call after the deadline date for nominations from the IAFP membership. Nominations are encouraged and should be submitted to Lee-Ann Jaykus, Chair or through the IAFP office.

Chairperson: Lee-Ann Jaykus.

Past Presidents' Committee

Members Present: Jenny Scott, Henry Atherton, Jack Guzewich, Bob Sanders, Michael Brodsky, Ron Case, David Fry, and Bob Gravani.

Board Members and IAFP Staff Present: Paul Hall, Anna Lammerding, and David Tharp.

Meeting Called to Order: 3:17 p.m.

Recording Secretary of Minutes: Jack Guzewich.

Old Business: None.

New Business: Bob Gravani will chair a subcommittee with Jenny Scott and Michael Brodsky as members to develop a draft Code of Ethics for IAFP. The draft will be circulated to other Past Presidents' Committee members for comment. The final document will be forwarded to the IAFP Board for consideration.

Recommendations to Executive Board:

1. David Tharp, Executive Director should notify the Past Presidents' Committee Chair of any IAFP Award Category without nominees when 4 weeks are left in the nomination period. The Past Presidents' Committee will make nominations for those Awards without nominations.
2. Do not schedule the Past Presidents' Committee meeting at the same time as the Foundation Fund and Constitutions and Bylaws Committees. Schedule the other two Committees at 3:00 p.m. – 4:00 p.m. and Past Presidents' at 4:00 p.m. – 5:00 p.m.

Next Meeting Date: August 14, 2005, Baltimore, MD.

Meeting Adjourned: 4:44 p.m.

Chairperson: Jenny Scott (for Jim Dickson).

PROFESSIONAL DEVELOPMENT GROUPS

Applied Laboratory Methods PDG

Members Present: Timothy Jackson, Michael Brodsky, Claire Lee, Philip Combs, Patricia Rule, Jeff Kornacki, Ruth Eden, Christine Aleski, Patricia Rule, Reginald Bennett, Jill Gebler, Elena Enache, Robert Behling, Lucy Buczek, Cynthia Zook, William Cray, Mika Tuomola, and George Wilson.

New Members: Debbie McIntyre, Gary Genlser, and Ken Davenport.

Meeting Called to Order: 10:08 a.m.

Discussed the purpose of PDG for promotion of professional development related to specific area and mission statement.

Gary Acuff, IAFP Executive Board had indicated the goal of developing additional symposium of an applied nature. Designate "applied" on submitted symposium or workshop proposal if that is the intent.

IAPF anti-trust policy was read to the committee.

Old Business:

General discussion of previous and current symposium.

Workshop I: Your Data, Your Job: Quality System for Microbial Food Analysis Workshop Attendance was 35 well above last year. The background of the attendees was appropriate for the content and there was a high level of discussion and interaction from all in attendance.

An attendee of the workshop indicated that the trending data breakout was the most directly applied material and suggested we improve on that theme.

Other symposia of interest related to methods were discussed.

General discussion that we have made no improvements to the web links offered by IAFP.

New Business:

General discussions of symposium and workshop topics for 2005.

Agreement for two symposia:

Sample Preparation Methods – Co-convenors: Phillip Combs and Lee-Ann Jaykus.

Indicator Organisms: So What ?!? – Co-convenors: Kelly Stevens and Jeff Kornacki.

Agreement on two workshops:

To Use or Not to Use: Practical Method Validation – Co-convenors: Christine Aleski and George Wilson.

Out of the File Cabinet, Into Use: Real World Experience with Trending Data – Organizer: Patricia Rule.

Group goals for an Applied Laboratory Methods Web site were discussed. Pat Rule and Bill Cray would like to coordinate the efforts of the committee on this effort.

Review other PDG links to see what additional features they include:

Useful links: Bill Cray and Patricia Rule to coordinate an E-mail to members about what is needed for useful links.

Suggested bi-annual articles on "other information": George Wilson, will prepare the first article 2-3 pages discussing Media QC requirements of a lab.

Discussed the verification of a method for lab utilization vs. validation of a method through schemes such as AOAC/MicroVal/AFNOR, etc.

Discussed the need for more information on method verification and validation and the need to harmonize verification schemes. Michael Brodsky pointed out a new document discussing a validation harmonization strategy was recently prepared by AOAC. He will provide the chair with a copy of the document for distribution to the committee members.

Discussed methods for increased awareness of the workshop programs and IAFP symposium and suggestions for ensuring success in the future:

- E-mail alerts in January after the program content is determined

- E-mail specific to the event, i.e., a single workshop, but more in advance
- 3-month reminder postcard of the IAFP
- Questionnaire of members to ask why or why not they attend

Book topics were discussed:

- Trend Analysis and Interpretation of Data,
- Method Verification – What is Relative/ What is Not, and
- Response to Food Security Issues

Recommendations to Executive Board:

1. Proposed Workshops for 2005: (1) To Use or Not to Use: Practical Method Validation – Co-convenors: Christine Aleski, George Wilson and (2) Out of the File Cabinet, Into Use: Real World Experience with Trending Data – Organizer: Pat Rule.
2. Proposed Symposium for 2005: (1) Sample Preparation Methods – Co-convenors: Phillip Combs and Lee-Ann Jaykus, (2) Indicator Organisms: So what ?!? – Co-convenors: Kelly Stevens and Jeff Kornacki, and;
3. Work with IAFP to enhance Web page for the Applied Laboratory Methods PDG on the IAFP Web site.

Next Meeting Date: August 14, 2005, Baltimore, MD.

Meeting Adjourned: 11:50 p.m.

Dairy Quality and Safety PDG

Members Present: Ginny Huber, Ron Schmidt, Helene Uhlman, Don Breiner, Joe Smucker, Kristen Matak, Helen Piotter, Jill Gebler, Steven Sims, Vickie Lewandowski, Loralyn Ledenbach, Allen Sayler, Randy Daggs, Dan Erickson, David Blomquist, Ken Anderson, Gaylord Smith, Eugene Frey, Stephanie Olmsted, Steven Murphy, John Bruhn, and Kathy Glass.

New Members: Gary Krejcarek, Philip Wolff, Purnendu Vasavada, Hussein S. Hussein, Rocelle Clavero, Dennis Gaalswyk, and David Robbins.

Visitors/Guests: Ken Davenport.

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

Recording Secretary of Minutes: Ken Anderson.

Old Business:

1. Committee membership needs to be updated. Chairperson will contact current members to determine if they wish to remain on the committee.
2. Need to improve participation in IAFP from dairy science students.
3. A motion was passed to create a task force to develop an awareness of IAFP and its dairy related program and report back at the 2005 Annual Meeting.

   Task Force Membership: Hussein S Hussein, Chair, Vicki Lewandowski, Allen Sayler, and Loralyn Ledenbach.
4. Of the proposals submitted last year, three symposia and one workshop were accepted for this year's program.

New Business:

1. Committee members urged to submit nominations for next year's IAFP awards.
2. Proposal for symposia: Dairy Regulations – Issues & Updates
   - Raw Milk Pathogens: What are the risks?
   - Dairy Security in Today's Environment
   - Improvement of Cold Chain Management in Dairy Products
   - Materials Selected for Multi-Use Food
   - Contact Surfaces and Cleanability Testing and Evaluation of Multi-Use Food Contact Materials (submitted by CSP Committee and endorsed by the Dairy Quality and Safety Committee)
3. Proposal for Workshop:
   - Troubleshooting Fluid Milk Quality Problems

Recommendations to the Executive Board:

1. To improve participation from NCIMS committee members, it is requested that meeting room space be provided for NCIMS committees as was done in past years.

Next Meeting Date: August 14, 2005, Baltimore, MD.

Meeting Adjourned: 3:15 p.m.

Chairperson: Gaylord Smith.

Food Safety Network PDG

Members Present: Giselle Julien-Davis, Paul Uhler, Sid Camp, and Brian Himelbloom.

New Members: Robert Smith, Paula Fredorka-Cray, David Bloomquist, and Maria Nazarowec-White.

Board Members and IAFP Staff Present: Paul Hall and Donna Bahun.

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

Recording Secretary of Minutes: Giselle Julien-Davis.

Old Business: Paul Uhler will be assuming the role of Vice Chairperson. He was elected at last years meeting.

New Business: Submit topic for symposia for IAFP 2005. Topic of symposia: "When Do You Count the Environment?"

Sub-topics will cover various perspectives on environmental testing and the interpretation of data. Presenters will be from regulatory, industry, and European industry. Main focus of the group for the upcoming year will be to compile a list of favorite sites for information. Group members will do a critical review of web sites that contain information relevant to the food industry. An evaluation template will be designed to "rate" sites. Sites will be evaluated based on information, quality, ease of access, and how current information is on the site. Review of sites will be published quarterly.

Recommendations to Executive Board:

1. List meeting attendees by organization/company name, in addition to the alphabetical listing in the list of attendees.

Next Meeting Date: August 14, 2005, Baltimore, MD.

Meeting Adjourned: 11:35 p.m.

Chairperson: Giselle Julien-Davis.

Food Sanitation PDG

Members Present: Mark Moorman, Gloria Swick-Brown, Larry Mendes, Peter Snyder, Lori Randall, Geri Barone, Chris Remus, Dennis Bogart, Todd Clark, Wayne Knudson, Charles Giambrone, Adel Makdesi, Frank Pool, Gordon Mowat, Ken Janes, Jeff Varcoe, Fred Reimers, and Mark Carter, Brian Anderson, Kelly Stevens, and Zeb Blanton.

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

Recording Secretary of Minutes: Brian Anderson.

Old Business: Mark Moorman, Chairperson reviewed role of Food Sanitation PDG. Symposia was approved "Sanitation–Because You Have To Be Clean To Be Safe" at last year's meeting and will be presented August 11, 2004.

Reviewed progress made on development of food safety icons for food manufacturing. Organized by Mark Carter. Thirteen icons were proposed organized in 4-targeted areas, GMP, Process Controls, Cleaning and Sanitizing, Environmental Control.

Discussed how to best deploy icons. Suggestions included download off IAFP Web site for small fee or donation. Next step are to get artists rough draft by Oct. '04 and review with PDG group at next annual meeting.

New Business: Mark Moorman suggested changing name of the PDG to incorporate the word "hygiene" in an effect to broaden mission to outside of North America. Motion made to change PDG name to "Food Hygiene/Sanitation PDG." Passed.

Mission statement changed to "To provide information on the developments in hygiene/sanitation in the food industry."

Zeb Blanton was nominated chairperson for 2005.

Recommendations to Executive Board:

1. Proposed symposium for 2005: "Cleaning and Sanitizing in Food Operations." Sessions to include: (1) Pathogens in Food Operations: Their Source and Level, (2) Food Contact Surface Contamination and Pathogen Transfer, (3) Cleaning and Sanitizing the Niches and Removing Biofilms in Foodservice, the Chemics, the Procedures, Their Effectiveness, (4) Surfaces to Determine Safety and Tracking Pathogens in a Facility, (5) HACCP Process Design and Management of Cleaning and Sanitizing Process, and (6) Shortening Your Sanitation and Maintaining the Quality. Suggested Convenor: Pete Snyder. Moderators: Jeff Varcoe and Zeb Blanton. Assist with developing symposium program: Adel Makdesi, Dennis Bogart, Charles Giambrone, Mark Moorman, Brian Anderson, and Jeff Varcoe.
2. Suggest changing the name of Food Sanitation PDG to Food Hygiene/Sanitation PDG.
3. Change the mission of the PDG to "To provide information on the developments in hygiene/sanitation in the food industry."

Next Meeting Date: August 14, 2005, Baltimore, MD.

Meeting Adjourned: 4:45 p.m.

Chairperson: Mark Moorman.

Food Toxicology and Food Allergens PDG

Members Present: Pamela Wilger, Michael Meusah-Wilson, Carmen Campos, Wayne Knudson, T. J. Fu, Chris Remus, Ewen Todd, Wilson Rumbeiha, Kathleen O'Donnell, Mika Tuomola, James Ball, Peter Cressey, Mark Moorman, Courtney Halbrook, Catherine Nnoka, Brett Gardner, JillAnn Williams, Maria Nazarowec-White, Jennifer Tong, Tom Schwarz, Peter Slade, Rocelle Clavero, and Ginny Edleman.

Board Member Present: Kathy Glass.

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

Recording Secretary of Minutes: Catherine Nnoka.

It was agreed that the group should petition to the IAFP Executive Board to become a professional develop group on food toxicology.

All individuals present agreed to become members of this new PDG.

A preliminary mission statement for the food toxicology PDG was adopted: To facilitate communication on topics in food toxicology including food allergens.

Members decided to propose two symposia to the 2005 annual meeting program on food toxicology and food allergy. Very preliminary programs for these symposia were drafted and submitted to the Program Committee. In keeping with instructions from the board liaisons at the meeting an effort was made to select applied topics for these sessions.

Recognizing that most individuals at the meeting represented other disciplines, it was agreed that additional input should be solicited from food industry toxicologists to gather support before continuing with the program development.

In order to attract participants who might not attend the meeting otherwise, it was suggested that the Program Committee be petitioned to schedule the food toxicology and food allergy sessions on Monday morning and afternoon. This would allow individuals to attend IAFP 2005 on Sunday (Food Toxicology/Allergy PDG meeting and Opening Session ceremonies) and Monday (toxicology allergy session). Special brochures or advertisements could be made to advertise/promote this new program to the appropriate audiences.

One suggestion was that perhaps the Program Committee could consider these sessions as special add-ons to the regular program since they would likely attract a smaller subset of participants than the overall meeting. Another thought was that the anticipated smaller size (50 people) of these sessions might lend itself to a roundtable/seminar type of format rather than a full symposium.

A conference call will be scheduled after IAFP 2004 to continue planning for IAFP 2005. All participants in this meeting will be invited to participate.

Recommendations to Executive Board:

1. To become a Professional Development Group of IAFP on Food Toxicology and Food Allergens.
2. Proposed symposia for 2005 on Food Toxicology and Food Allergens.

Next Meeting Date: A conference call will be scheduled after IAFP 2004.

Meeting Adjourned: 4:45 p.m.

Interim Chairperson: Mark Moorman.

Interim Vice Chairperson: Catherine Nnoka.

Fruit & Vegetable Safety and Quality PDG

Members Present: Donna Garren, Brett Gardener, Laura Dunn Nelson, LeAnn Chuboff, Tom Schwarz, Wendy Maduff, Bredan Niemira, Robert Stovicek, Stacy Stoltenberg, Amy Simonne, Lynette Johnston, Huw Smith, David Rodriguez-Lazazo, Nigel Cook, Rebecca Guy, Suresh Pillai, Larry Beuchat, Glenner Richards, Pamela Wilger, Tony Valenzuela, Gala Jaramillo, Jim Gorny, Keith Ito, Joe Furuike, Keith Refsnider, Veny Gapud, Montserrat Hernandez Iturriaga, and Leopoldo Orozco Ramirez.

Board Member Present: Frank Yiannas.

Election of Vice Chair: Suresh Pillai.

Jim Gorny Presentation:

- Development of FAQs regarding the microbiology of fresh produce
- Educational outreach efforts for press

Discussion:

- *Food Protection Trends*—develop paper that goes to all members
- Press: need simple language
- Partnership for Food Safety Education: consumer messages for produce handling
- Outreach to growers: information how to handle test results
- Need peer review information that develops messages for press: credible source, instead of expert witness
- Develop a list of experts for press contact
- Sub-group to develop Jim Gorny, Chair. Larry Beuchat, Linda Harris, Brett Gardner, Jennifer Tong, Laura Dunn Nelson, Keith Refsnider, Thomas Schwarz, Brendan Niemira, and Suresh Pillai.

Government Update: Outbreaks

- Feb 2004: clusters of *Cyclospora* outbreaks—basil/mesculin mix
- Current cyclospora outbreak: nursing home—vehicle, snowpeas (PA, exposure June)
- *Salmonella*/Sheetz: roma tomatoes—450 cases, Javiana, Thompson, Munchin, Anatum, Domestic, SC, FL
- Canadian outbreak: Ontario, SC origin, Javiana
- *Salmonella*, multistate, berta, braenderup, Javiana—either tomatoes or lettuce
- Almonds—*Salmonella*, *Salmonella* Enterditis, orchard(s) still try to determine, cases 42, lot not determined, thus recall very large
- Green Onions, Sept-Nov: Hep A, TN, GA, NC, PA, over 600 cases, 4 deaths, Mexican origins
- Sprouts, one O157 and one *Salmonella* in 2004, seed from Australia
- Cantaloupes—daycare, flooding, cantaloupes cross contaminated, bad hygiene issue at point of preparation

- Outbreak reporting: produce the vehicle, but cause is mishandling at point of preparation
- Attribution Project: 2-3 years, using outbreak data to attribute to different food categories, John Painter, CDC the lead
- Gives no idea about the contributing factor, like mishandling
- MDP program
- Produce Safety Action Plan—FDA
- GAP Farm video—Cornell University
- Screening of the Fruits, Vegetables and Food Safety: Health & Hygiene on the Farm
- Selling for $20
- Cornell, farm survey for growers
- Received a recent grant for interactive website
- January: GAPs research conference, Orlando, FL
- IFPA, allergen management guide for members
- Foreign objects management plan
- Sanitary design for equipment
- UC, Davis, TX AM, UFL, sanitary workshops across country
- Tri-state consortium: finishing up in August, number of publications

United Update:

- NRA—education for handlers, ServSafe: here is information on produce handling
- Reception: Keith Refsnider and Jennifer Tong, Chairs for next year's event

Symposium Topics:

- Sanitary Design for Field/Packingshed/ Repacking Equipment, Jim Gorny, Ron Schmidt
- Ecology of Pathogens of 5 vegetables, three states—tri-state consortium: Suresh Pillai, Linda Harris, Bob Gravani, Lee-Ann Jaykus (clean green project)

Recommendations to Executive Board: None.

Next Meeting Date: August 14, 2005, Baltimore, MD.

Chairperson: Toni Hoffer.

Meat and Poultry Safety and Quality PDG

Members Present: Carl Custer, Margaret Hardin, Michael Meusah-Wilson, Mark Pratt, Patrick Dodsworth, Brian Sheldon, Xin Li, Randy Huffman, Bill Sveum, Ann Marie McNamara, Roger Cook, Jerry Erdmann, Dane Bernard, Michael Bradley, John Marly, John Hudson, Jackie Boerema, Robin Kalinowski, Peter Bodnaruk, Indaue Mello, Jinru Chen, Manan Sharma, Justin Ransom, Kristina Barlow, Peter Cressey, Lynn McMullen, Eileen Cole, Stan Wallen, Tanya Roberts, Wafa Birbari, Alejandro Mazzotta, Craig Henry, Jenny Scott, Rick Holley, John Cerveny, Cynthia Dohm, Todd Bacon, Michael Michel, Stan Bailey, Paul Uhler, Mueen Aslam, Ron Usborne, and Eric Line.

Board Member Present: Gary Acuff.

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

Recording Secretary of Minutes: Margaret Hardin, Vice Chair.

Old Business: Review of session developed by PDG for this year's meeting: "Validation and Verification of Pathogen Interventions in Meat and Poultry Processing."

New Business: Members reviewed the three proposed symposia for 2005 submitted before the meeting. Several issues and publications related to food safety over the past year have provided ideas for symposia.

The increased requests by customers and regulatory agencies for microbiological testing led to the development of one session on "Microbiological Sampling: the risks; the reality." The symposium deals with a discussion of 35 years of environmental sampling – what have we accomplished and ends with a talk on how to actually have confidence in your testing program.

Recently published literature have addressed the risks of *Listeria* at retail. Thus another proposed symposium investigates the risks at the restaurant and retail level and their associated control measures, including the importance of sanitation.

Another important issue that has arisen associated to meat and poultry safety is the risk and current interventions in the production of semi-dry and dry meats such as jerky and pepperoni. The third proposed symposium addresses these risks, the latest in intervention research and practical solutions to potential problems that can occur in the production of this product.

Recent publications in the literature have addressed the proper use and misuse of microbial predictive models used to validate food processes. The proposed session topic was further developed during the meeting to include speakers from academia and ARS who have developed these models. Speakers from the Agency and industry were included to discuss how the models are currently used.

A few members from the poultry side of the PDG discussed questions and comments they have received relating to the current status of *Campylobacter*. Some of the issues and concerns include what to use for methodology, what do the results really mean for food safety and what is the status of the Agency on testing?

A symposium was developed during the meeting to address these concerns including methodology – where are we and several on-going quantitative tracking projects of *Campylobacter* from the farm through processing currently being done in North America and Europe.

Other general topics for discussion included the release of new *Salmonella* results and their relative significance and the current status of the proposed egg safety action plan.

Recommendations to Executive Board: None.

Next Meeting Date: August 14, 2005, Baltimore, MD.

Meeting Adjourned: 1:50 p.m. Members continued to fine-tune symposium ideas until 3:00 p.m. Five symposia were sent to the Program Committee for consideration for IAFP 2005.

Chairperson: Carl S. Custer.

Microbial Risk Analysis PDG

Members Present: David Baker, John Bassett, Michael Brodsky, Bob Buchanan, Yuhuan Chen, Peter Cressey, Patrick Dodswouth, Jerry Erdman, Aamir Fazil, Leon Gorris, Andrew Hudson, John Hicks, Ken Janes, Fumiko Kasuga, Wayne Knudson, Anna Lammerding, Johan Lindblad, Deon Mahoney, Michael Mensah-Wilson, Charisse Newcomer, Tanya Roberts, William Ross, Jenny Scott, Peter Slade, Mark Tamplin, Ewen Todd, and Ron Usborne.

Meeting Called to Order: 10:02 a.m.

Recording Secretary of Minutes: Aamir Fazil.

The Chair welcomed all present and explained the purpose and scope of the PDG. He thanked Richard Whiting for skillfully chairing the previous two PDG meetings.

All attendees were asked to briefly introduce themselves, giving their affiliation and their interest in Microbial Risk Analysis. Sign-in forms were circulated.

An important task for the PDG was the nomination of a new vice-chair. Two persons had previously shown interest (Mark Tamplin, Aamir Fazil). The meeting did not propose more candidates. A secret vote identified Aamir Fazil as the nominee for the executive board to consider. Mark is gratefully thanked for showing interest in this commitment.

The agenda proposed by the chair was accepted by the meeting, no further items were added.

Review of the minutes of 2003. The meeting approved the minutes as written and published in the November 2003 issue of *Food Protection Trends* and on the PDG Web site http://www.foodprotection.org/about%20IAFP/committees/microbialrisk.htm.

Old Business: The chair recalled the old business items also discussed during the 2003 PDG meeting.

The meeting was encouraged to consider publicizing in *Food Protection Trends*.

Ewen Todd informed the meeting that the IAFP document he had been working on and was meant to assist risk managers in Risk Assessment was put on hold until Codex Alimentarius had specified their guidance on risk management.

The chair reviewed the symposia on the program of IAFP's Annual Meeting that had been developed and proposed during last year's PDG meeting. The program committee had selected three out of four proposals:

- Session 08: Integrating genomics data in quantitative risk assessments. Monday afternoon, August 9, 2004. Organizers: Yuhuan Chen, Ruff Lowman, and Don Schaffner;
- Session 19: Risk & Control of *Enterobacter sakazakii*. Wednesday morning, August 11, 2004. Organizers: Tim Jackson, and Maria Nazarowec-White (developed in conjunction with the PDG "*Applied laboratory methods*").
- Session 26: Optimizing data and minimizing risk. Wednesday afternoon, August 11, 2004. Organizers: Michael Brodsky and Don Schaffner.

Other sessions of interest to the PDG membership were mentioned:

S02: Retail Food Safety Risks. Monday morning, Aug. 9.
S10: Food Safety for Immunocompromised Populations. Tuesday morning, Aug. 10.
S12: Transfer and spread of pathogens in food environments. Tuesday morning, Aug. 10.
S21: Safety of raw milk cheeses – the state of the science. Wednesday morning, Aug. 11.
Technical session 05:
Risk Assessment. Tuesday afternoon, Aug. 10.
Poster session 03:
Tuesday morning, Aug. 10.

Developments in Codex Alimentarius

The chair informed the meeting of some recent developments on Risk Analysis in Codex Alimentarius and several members shared personal experience on more national developments to the meeting. Some of the points raised were:

- Codex has firmly adopted the Risk Analysis framework. The Codex Committee has adopted the principles for risk analysis at step 8.

- Guidelines for risk management are in the making (for the last 4 years) and more work is needed, but from this work three new important concepts have emerged, namely that of the Food Safety Objective, Performance Objective and Performance Criterion. Codex took these out of the risk management document and the Committee on General Principles endorsed them at step 5/8. (ftp://ftp.fao.org/codex/alinorm04/al0433ae.pdf);
- ILSI Europe published proceedings from a workshop on FSO that was recently published. This can be downloaded from http://europe.ilsi.org/publications; and
- ICMSF published book 7 and proceedings of a workshop in Zurich on the topic of FSO and related concepts. http://www.foodscience.afisc.csiro.au/icmsf.

WHO/FAO conducted "global risk assessment" studies. Some are concluded. Some are ongoing.

- MRA on *Salmonella* in poultry and egg (concluded; published 2003 http://www.fao.org/es/ESN/food/risk_mra_salmonella_report_en.stm);
- MRA on *Listeria* in ready-to-eat foods (concluded; published July 29, 2004 on http://www.fao.org/es/ESN/food/risk_mra_listeria_report_en.stm);
- *Campylobacter* in chicken products (ongoing but expected to be released in 2004); and
- *Vibrio*: (ongoing; publication expected soon).

While the above risk assessments run over several years, in March of 2004 WHO and FAO called an expert consultation on *Enterobacter sakazakii*. One element of this was a preliminary risk assessment for this microorganism. This was developed within the three-day meeting. The report (final stage) is published: http://www.fao.org/es/ESN/food/risk_mra_entero_report_en.stm.

The WHO Web site also can bring you to these publications: http://www.who.int/foodsafety/micro or http://www.who.int/fsf.

Also on the WHO and FAO websites, quite technical guidelines to hazard identification and hazard characterization can be found. A guideline on Exposure Assessment is underway.

It was mentioned by Bob Buchanan that the USA is starting new risk assessments on *Listeria monocytogenes* in smoked fish and another one of this pathogen in soft cheeses (this one together with Canada). A MRA on *Clostridium perfringens* relating to cooling strategies was underway. In addition, the relevant US agencies have several risk profiles under development which they use for internal purposes to document the available knowledge as well as the gaps in knowledge for particular pathogens and foods. Bob also mentioned that there had been a request in codex circles (JECFA, CCFH) to consider a chlorine risk assessment, which would be a first risk-risk trade-off exercise in a global setting.

Fumiko Kasuga informed the meeting that Japan is developing a risk assessment on BSE and risk profiles on *Clostridium botulinum* and on norovirus.

Peter Cressey mentioned that New Zealand was developing MRAs for *Salmonella* and *Campylobacter*. Several risk profiles are being prepared that are used for risk ranking purposes.

Deon Mahoney commented that extensive risk profiles developed by Australia had been developed over recent years and that new risk profiles considered were on norovirus in oysters, *Bacillus cereus* in infant formula and raw milk cheese risks.

During the discussions it was noted that a lot of attention worldwide was contributed to risk assessment, but that much less attention was given to risk communication or risk management.

It was also raised that there was confusion about who the risk manager was, someone in government or in industry? It was commented that the function could be found in both, but with different scope and focus.

The society for Risk Analysis will organize a meeting in Arlington (VA) on 28 and 29 September "Risk Assessment and Antimicrobial Resistance: Past Present and Future" http://www.sra.org.

Amir Fazil informed the meeting that a strategic initiative "Needs, Gaps and Opportunities Assessment in the area of microbial contamination of food and water", had been conducted which was focused on microbial risk assessment for food and water. This study was funded by the Canadian Institutes of Health Research (CIHR) Institute of Infection and Immunity, the Canadian Water Network, and the Natural Sciences and Engineering Research Council. The final report can be found on http://www.uoguelph.ca/OAC/CRIFS/.

In a recently concluded European Union sponsored project, a workshop was held on "improving the interface between risk assessment and risk management". The conclusions can be downloaded from www.ra-rm.com.

WHO and FAO developed a Risk Analysis Manual, consisting of a basic text by Charlie Yoe and Leon Gorris and case studies, two on chemicals and one on *Vibrio*. The manual is posted on the FAO website (http://www.fao.org/es/ESN/food) but temporarily

unavailable. It aims to be a resource for risk manager to appreciate the risk analysis principles of what infrastructure may be required to work in that framework.

A second EU project (RAIN: Risk Analysis Information Network) is advertising it aims, amongst others, to set up a database to share data relevant to risk analysis. The database does not seem to be freely accessible. Some info Website: http://www.eu-rain.com. They will have a meeting early December 2004 in Italy.

Mark Tamplin mentioned that PMP/Combase do contain and add data sets to their system and that these are freely accessible. http://www.arserrc.gov/mfs/pathogen.htm and http://wyndmoor.arserrc.gov/combase/.

Bob Buchanan recalled the food risk clearinghouse that also is a freely accessible repository for risk assessment data. http://www.foodriskclearinghouse.umd.edu/.

Another news item was that *Journal of Food Protection* soon will publish a special issue compiling manuscripts from presentations given at the 1st international symposium on microbial risk assessment held in Baltimore end July/early August 2002.

The PDG was invited to consider getting involved in issuing public comment on MRA studies, as other professional bodies, trade associations or interest groups were doing. The meeting discussed some of the pros and cons.

The chair mentioned that through JIFSAN, the US had developed a large number of (short-) courses, summer courses and several distance learning courses together covering many different aspects of risk analysis. See for details: www.jifsan.umd.edu.

From a very interactive and lively brainstorm, the following ideas emerged:

Symposia:

- Risk profiling and risk ranking for foodborne pathogens, including the purpose and methodology and different international views on those (initiators: Peter Cressey and Tanya Roberts).
- The latest developments in Risk Communication, covering best practices and challenges (Initiators: John Bassett, Ewen Todd, and Bill Ross).
- Application of Food Safety Objective in Food Safety Management (Initiators: Tanya Roberts and Leon Gorris).
- Data requirements for MRA (Initiators: Isabel Walls and Leon Gorris).

Workshop:

- Using Risk Communication to realize value from Risk Management and Risk Assessment, aimed to share a good understanding of Risk Communication, how it fits into Risk Analysis, how different stakeholders play a role in RC (initiators: David Baker and Leon Gorris).
- "Statistics as a Tool in Microbial Evaluation of Foods"; on the basics of assessing food safety, including sampling, detection limits, variability (Initiators: Ron Osborne and Patrick Dodsworth).

The Chair noted that the PDG has a website at http://www.foodprotection.org/about%20IAFP/committees/microbialrisk.htm.

Ideas on interesting additions or updates to the website info are appreciated and can be send to the chair (leon.gorris@unilever.com).

IAFP had asked PDG members to consider whether they know of any book titles or topics they would like to see published. Ideas can be sent to the chair to pass on to IAFP.

It was mentioned that a new PDG on Food Toxicology and Food Allergens would have its first organizational meeting on Aug 9, 2004 at 3:00 p.m.

Recommendations to the Executive Board:

1. There were no formal recommendations to the Executive Board, other than to endorse the nomination of Aamir Fazil as the Vice Chair for the PDG.

Next Meeting Date: August 14, 2005, Baltimore, MD.

Meeting Adjourned: 12:10 p.m.

Chairperson: Leon Gorris.

Outreach Education PDG

Members Present: Veny Gapud, Gordon Mowat, Barbara Ingham, and Robert Brooks.

New Members: Gala Jaramillo, Jinru Chen, Amy Simonne, Frank Guray, and Lynn Riggins.

Board Member Present: Gary Acuff.

Meeting Called to Order: 3:05 p.m.

Recording Secretary of Minutes: Gordon Mowat.

Old Business: Review of minutes from 2003 meeting:

- approved as read
- discussed recommendations to Executive Board

New Business:

1. New Pamphlet
   - Veny Gapud, Barb Ingham and Gordon Mowat have been developing a new pamphlet entitled "What You Need to Know About Food Allergies"
   - Currently seeking an external reader to review the content. Perhaps someone from FDA.
2. Proposal for symposium on Communicating Food Safety Issues to Consumers–Hype versus Reality at the IAFP 2005 Annual Meeting. The suggested topics and speakers were as follows:
   - Communicating Risk to the Consumer – Doug Powell, Univ. of Guelph.
   - Trans Fat: Taking Trans Out of the Frying Pan and Oven – Dan Lampert, Cargill Foods.
   - Acrylamide: Facts versus Fantasy – Bruce Phillips, McCain Foods, USA.
   - Combating Misinformation – Labelling and Carbohydrates – Darryl Sullivan, Covance Laboratories.
   - Organic Produce – Safer or Not – Michael Doyle, University of GA.
   - Consumer Attitudes Toward Technological Innovations – Christine Bruhn, University of CA, Davis.

Recommendations to Executive Board:

1. The Outreach Education Professional Group requests that the Executive Board review again the role of the IAFP and PDG Web site in presenting information. The Outreach Education PDG would like to see pamphlets posted on the IAFP Web site as PDF documents with the option to purchase printed pamphlets.

Next Meeting Date: August 14, 2005, Baltimore, MD.

Meeting Adjourned: 4:45 p.m.

Chairperson: Veny Gapud.

Retail Food Safety & Quality PDG

Members Present: Frank Guray, Harry Field, Courtney Halbrook, Jennifer Tong, John Marcy, Craig Henry, Lynn Helmers, John Foster, Gordon Mowat, Michael Mensah-Wilson, Milinda J. Dwyer, Thomas McCaskey, Veny Gapud, LeAnn Chuboff, Fred Reimers, Toni Hofer, Jill Ann Williams, Brett Gardner, Keith Schneider, Howard Malberg, Gloria Swick-Brown, Joe Eifert, Alfred Fain, Zeb Blanton, Pete Snyder, Alex Von Holy, Amy Simonne, Larry Mendes, Lori Randall, Lynn Riggins, Geri Baroe, and Faye Feldstein.

Board Members and IAFP Staff Present: Frank Yiannas and Lucia McPhedran.

New Members Present: 21.

Meeting Called to Order: 10:00 a.m.

Recording Secretary: Al Fain.

Old Business:

1. Reviewed symposium developed last year by PDG members (presented as #S2 on Monday morning).
2. Review of the ongoing International Food Safety Icon II project. Thirteen messages have been selected and draft icons will be created by Disney artists later this summer.

New Business:

Several topics were discussed as possible symposia for 2005. The PDG submitted two applied symposia proposals:

- HACCP process standards for unified food safety process control: Conveners: Pete Snyder and Vijay Juneja.
- Do it right every time! Theory, practice, outcome: A behavioral approach to performance based food safety management. Conveners: Fred Reimers, and Zeb Blanton.

PDG agreed that we should make better use of the PDG contact list or E-mail list. Chairperson agreed to include all PDG member E-mail addresses (no blind copy) in future E-mail correspondence with PDG members.

PDG discussed the need, feasibility and format for development of a Web site or other resource that could provide IAFP members a source of references and research on important retail food safety issues.

Pete Snyder discussed his plan to develop a series of papers on developing HACCP plans for retail food operations. This effort will enhance the development of safe food process innovations at retail.

Recommendations to Executive Board:

1. PDG recommends that a listserve be established with the IAFP webmaster for "hot topic" discussions and to facilitate member communications. Additionally, a listserve could limit the problems some members have with their E-mail. Specifically, some members have difficulty receiving E-mails that contain many recipients or E-mail attachments that may get filtered out by some computer programs.

Next Meeting Date: August 14, 2005, Baltimore, MD.

Meeting Adjourned: 11:50 p.m.

Seafood Safety and Quality PDG

Members Present: K. O'Donnell, P. Tom, W. Ruwibeilha, J. Hicks, S. Drake, P. Hibbard, J. Bell, M. Janes, A. Fain, S. Reddykotha, S. McCarthy, D. Marshall, H. Field, Williams, B. Himelbloom, L. Andrews, R. Smith, and R. King.

Board Members and IAFP Staff Present: Anna Lammerding and Didi Loynachan.

Recording of Minutes: Linda Andrews.

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

Approval of Agenda 2003. Peter Hibbard read Anti-Trust Guidelines for Association. Agenda approved.

Old Business:

a. Minutes of 2003 Meeting, New Orleans Approved by unanimous vote.
b. SSQPDG Membership Roster. Check on Web site for corrections, suggestions, new items.
c. Announcement of IAFP 2004 Symposium #22 "Packaging Innovations, Safety Concerns and Seafood", Wednesday Aug. 11, 2004 a.m. Summary: Brief summary given of speakers as listed in the program book and abstracts.
d. Summary of IAFP 2004 Workshop "Best Practices for Safe and High Quality Aquaculture Products" 16 attendees, morning lectures, followed by field trip to Gila Bend Shrimp Farm. Videos were seen on the trip to and from the shrimp farm. Met with owners of farm and toured the grounds and ponds.
e. Summary of Symposiums from 2003, discussed attendance, which was well attended. See web site for details.

New Business: Discussion of topics for proposing a symposium at IAFP 2005.

Symposium Ideas for Seafood Safety and Quality 2005

Oceans and Human Health: Doug Marshall (org/conv) and Susan McCarthy (conv).

- NOAA program overview – NOAA OHH Director, speaker to be determined (tbd)
- Marine proxies for human health - tbd
- Harmful Algal blooms – NMFS Spencer Garrett, tbd
- Indicators of fecal pollution - tbd
- Point Source Tracking - tbd
- Trends of illness at resorts and on cruise ships – CDC Speaker, tbd

Applied Symposium: Practical Verification Tools for Seafood.

Linda Andrews and Marlene Janes (org/conv)

Personnel hygiene and sanitation verification – Marlene Janes

Thermal process validation and verification Linda Andrews

Forensic Approach: *L. monocytogenes* in ready to-eat seafood – speaker tbd

Forensic Approach: Histamine – speaker tbd

Forensic Approach: *Salmonella* – RTE– speaker tbd

Round Table Discussion (on above and other topics)

Environmental Compounds in Seafood: Realities and Perspectives — Kathleen O'Donnell, Peter Hibbard, John Hicks (Org and Conv).

Methyl mercury – Gary Myers

Antibiotics – speaker tbd

Flame retardants – speaker tbd

Endocrine disrupters – John's Hopkins – speaker tbd

PCBs – speaker tbd

Radionuclides – speaker tbd

Other New Business: Comments from committee members suggesting booklet topics. Will use information gained from proposed symposia to develop booklets.

Problems and Ideas: Hopefully all attendees will continue to be active.

Meeting Adjourned: 2:53 p.m.

Next Meeting Date: August 14, 2005, Baltimore, MD.

Student PDG

Members Present: Ben Chapman, Michelle Danyluk, Laura Bauermesiter, Manan Sharma, Yash Burgula, Wendy Maduff, Richelle Beverly, Aisha Abushelaibi, Chithea Lakshmanan, Lisa Mathiasen, Lynn Riggins, Justin Ransom, Brandon Carlson, Stacey Smith, Aaron Uesugi, Karen Chong, Willette Crawford, Leanne Ellis, Kristen Matak, Shelly Rodrigo, Stephanie Drake, Lynette Johnston, Hugh Griffiths, Brooke Whitney, Sally Foong, Olanna White, Efi Papafragkou, Montserat Hernandez-Itorriaga, Ma Fernanda Franco Silva, Leopoldo Orozco Ramirez, and Christine Stanko.

Board Members and IAFP Staff Present: Kathy Glass, Frank Yiannas, Jeff Farber, Gary Acuff, Stephanie Olmsted, Steve Murphy, and David Tharp.

Guests: Christine Bruhn, Amy Simonne, Peter Hibbard, Zeb Blanton, Susan Sumner, Pattie McNiel, John Bruhn, and Steven Blanton.

Meeting Called to Order: 1:20 p.m.

Old Business: Session monitor summaries; published October 2003.

New Business: Session monitor sheet posted on board. Thanked old officers and introduced new officers. Ben talked about t-shirt program and expanding the Web site. Flyers were distributed to promote membership.

Speaker Frank Yiannas spoked about continual learning.

There will be a meeting for the 2005 symposium this afternoon at 1:45 p.m.

In response to the board recommendations regarding the name of the Student PDG to Student Association, a task force is being developed to examine the advantages and disadvantages of remaining a PDG versus becoming an affiliate. A recommendation will be made at next year's meeting.

Everyone was invited to the Student Mixer Tuesday night.

This year's reception was sponsored by John Morrell, McDonald's Corp., Kraft Foods North America, Walt Disney World, Ecolab, Cryovac/Sealed Air, British Columbia Food Protection Association, California Association of Dairy and Milk Sanitarians, Portugal Association for Food Protection, Almond Board, UC-Davis Food Tech Club, Kansas State-Food Science Institute and FSnet@Guelph.

Michelle encouraged involvement from everyone.

Next Meeting Date: August 14, 2005, Baltimore, MD.

Meeting Adjourned: 1:40 p.m.

Chairperson: Michelle Danyluk and Ben Chapman (for Renee Raiden).

Viral and Parasitic Foodborne Disease PDG

Members Present: Lee-Ann Jaykus, Sabah Bidawid, Nigel Cook, Doris D'Souza, Bert Bartleson, Judy Greig, Jack Guzewich, Thomas Schwarz, Huw Smith, and Julie Jean.

New Members: Cynthia Zook, Suresh Pillai, Glenner Richards, Efstathia Papafragkou, Rebecca Guy, and Ann Goldie.

Board Member Present: Kathy Glass.

Meeting Called to Order: 10:00 a.m.

Recording Secretary of Minutes: Lee-Ann Jaykus.

Old Business: Reviewed minutes from previous year's meeting. Announced this year's symposium sponsored by the PDG.

New Business: Introduced Participants, new and old members. Discussed potential activities of PDG. Sabah Bidawid discussed the European Food Virology Network, a new endeavor that will serve as a clearing-house of isolates and sequences. This group is also working toward harmonization of sequencing efforts to facilitate genotyping. Dr. Bidawid stated that a similar prototype is being developed in North America. Nigel Cook also discussed EnviroNet, another European food virology network in development. The group discussed potential symposia ideas; decided to develop and submit one focusing on pre-harvest issues associated with viral and parasitic protozoal contamination of foods.

Announced the 2nd International Conference on Human Caliciviruses in November 2004 in France. Elected Dr. Doris D'Souza as Vice Chair, term to begin August 2005.

Recommendations to Executive Board: Recommend that the Board consider shortening PDG meetings for select groups that take only an hour to complete their business, or else consider staggering meeting times so that individuals can attend multiple meetings, if they so desire.

Next Meeting Date: August 14, 2005, Baltimore, MD.

Meeting Adjourned: 11:00 a.m.

Chairperson: Lee-Ann Jaykus.

Water Safety and Quality PDG

Members Present: Kathleen Rajkowski, Peter Slade, Louise Fielding, Donna Christensen, Michael Brodsky, Larry Cohen, Isabel Walls, Dean Davidson, Susan McKnight, and Rick Foster.

Board Member Present: Jeff Farber.

Recording Secretary of Minutes: Kathleen Rajkowski.

The Chairperson opened the meeting, welcomed attendees and introduced herself, Kathleen Rajkowski and Past Chairperson Susan McKnight.

A brief overview of meeting iterinary: Elect Vice Chairperson, symposium proposals, and workshop proposals.

Old Business: The workshop proposal was tabled and the group will put together a new one.

An outline for a proposal symposium on water quality as it relates to food products was distributed. The chairperson of the other PDGs were contacted to suggest speakers for this symposium. Discussion occurred and the topic met the criteria for "applied." The title for the symposium "Water, the Common Commodity" was finalized and submitted. Organized by K. T. Rajkowski.

New Business: Larry Cohen was nominated for Vice Chair and accepted the nomination. He was elected as Vice Chair. Board representative Jeff Farber attended the meeting. He asked if there was anything he could do to aid the Committee. Susan McKnight suggested that this Committee meet at a different time that the other PDGs. She suggested the morning session time.

Next Meeting Date: August 14, 2005, Baltimore, MD.

Chairperson: K. T. Rajkowski.

Affiliate Council Minutes

IAFP 2004 – August 8–11, 2004
Held at the JW Marriott Desert Ridge Hotel
Phoenix, Arizona

Affiliates Present:

Alabama	Tom McCaskey
Arizona	Chris Reimus
Brazil	Maria Teresa Destro
British Columbia	Terry Peters
California	John Bruhn
Capital	Carl Custer
Carolina's	James Ball
Florida	Peter Hibbard
Georgia	David Fry
Illinois	David Robbins
Indiana	Helene Uhlman
Kentucky	Sue Jewell
Metropolitan	Fred Weber
Michigan	Brian T. Cecil
Missouri	Gala Jaramillo
Nebraska	Tom Tieso
New York	Steve Murphy
Ohio	Gloria Swick-Brown
Ontario	Tom Graham
Portugal	Laurentine Pedrese
Pennsylvania	Gene Frey
Southern California	Margaret Burton
Texas	Fred Reimers
United Kingdom	David Lloyd
Upper Midwest	Dan Erickson
Washington	Stephanie Olmsted
Wisconsin	Randy Daggs

Members Absent: Korea, Connecticut, Idaho, Iowa, Kansas, Mississippi, Tennessee, and Wyoming.

Board Members and IAFP Staff Present: Paul Hall, Kathy Glass, Jeff Farber, Gary Acuff, Frank Yiannas, Anna Lammerding, David Tharp, Lisa Hovey, and Lucia Collison McPhedran.

Guests: Judy Greig, Sid Camp, Zeb Blanton, Roger Cook, Joe Disch, Malcolm McDonald, Dave Gagnon, and Fumiko Kasuga.

Meeting Called to Order: 7:05 a.m.

Recording Secretary of Minutes: Stephanie Olmsted.

The meeting was called to order at 7:05 a.m. by Affiliate Council Chairman Steven Murphy. A sign-up form for attendees was distributed for delegates and guests. There were 44 delegates and guests present.

Steven Murphy introduced Chris Reimus as the delegate from our newest affiliate, Arizona. It was also announced that there are also 2 new affiliates being worked on, New Zealand & Japan. The minutes from our 2003 meeting were distributed as part of the attendees packet, and were approved and seconded as published in *FPT*.

Executive Board Report: Paul Hall, IAFP President gave an extensive report from the Executive Board, and announced that the IAFP membership is stable, and that Gold & Silver sustaining memberships have increased. His report also included updates on *Food Protection Trends* and *Journal of Food Protection*. Reports on the 2004 IAFP attendance looks favorable, with an estimate of 1550 to 1600 attendees to be registered. There are 128 booths registered for the Exhibit Hall, and sponsorships are up 20% over last year. The Foundation Fund is also growing, closing in on $220,000.

IAFP Office Report: Reports were given by both David Tharp and Lucia Collison McPhedran. David was happy to report that after carrying a negative balance in the General Operating Fund for almost 15 years, we are finally showing a profit. Lucia encouraged the affiliates to take advantage of the Executive Board Speaking Program. She also encouraged the affiliates to keep her informed of any changes in officers, as well as contact information. Affiliates were also encouraged to utilize the Certificate of Merit Award. Fred Weber asked if nominees for the award needed to be members of IAFP, and this was confirmed that they do indeed need to be members of both the local affiliate, as well as IAFP. This past year, 36 of 39 annual reports were returned, which is the best return rate seen in many years.

Election of Affiliate Council Secretary: Steven Murphy went over the commitments expected of the Affiliate Secretary. Terry Peters from the British Columbia was nominated by the Nominating Committee, and was approved unopposed by the Council.

Affiliate Reception and Symposium: Steve reported that the affiliate reception & symposium was well attended. Capital Vial and Weber Scientific provided funding for this event. Continuation of this event was discussed with the attendees, and it was determined that it was of definite value to make plans again for Baltimore. Attendees were encouraged to provide suggestions for future topics to Steve or Stephanie Olmsted.

New Affiliates: Chris Reimus with the Arizona affiliate reported on the membership and the prior affiliation of the group with the National Environmental Health Association. Roger Cook from New Zealand also reported on progress in his country towards forming an affiliate.

Unfinished Business: David Tharp reported on the status of our Non-compliant affiliates. There are currently 4 affiliates that are not in compliance, however Lucia is working with these affiliates with hopes of bringing them back into compliance.

New Business: The winners of the 2004 affiliate awards were announced. They were:

Membership Achievement Award: British Columbia Association for Food Protection
Best Communication Materials Award: New York State Association for Food Protection
Best Educational Conference: Metropolitan Association for Food Protection
Best Annual Meeting Award: Florida Association for Food Protection
C.B. Shogren Memorial Award: Ontario Food Protection Association

It was discussed & decided that we would include affiliate Web sites as part of the consideration components for both the Communication and Shogren awards.

A lengthy discussion was held with the attendees discussing ways to drive membership. Ideas discussed included inviting other local affiliate members that are in close proximity, & waiving registration fees to those neighboring affiliates. It was suggested that IAFP look into the logistics of having a Powerpoint presentation made available including digital pictures that would be provided by the affiliates. It was recommended that IAFP staff investigate this possibility.

Affiliate Reports: Affiliate delegates present gave a brief synopsis of their activities over the past year reflecting membership, scholarships, educational and annual meetings, newsletters and Web sites and association with IAFP and other organizations.

Other Business: Steve Murphy thanked the affiliates that provided items for silent auction. He also encouraged & thanked affiliates for providing student support & scholarships. The IAFP staff was thanked for all of their hard work & support to the organization.

Passing of Gavel: Chairperson Steven Murphy expressed his appreciation to Lucia and the IAFP staff in assisting him during his term as the Affiliate Council Chairperson. He then passed the gavel to Stephanie Olmsted signifying the beginning of her term as chairperson of the affiliate council.

Next Meeting Date: August 14, 2005, Baltimore, MD.

Meeting Adjourned: 10:05 a.m.

Chairperson: Steven Murphy.

Committee and Professional Development Group

Recommendations to the Executive Board as Taken from Committee Minutes of Meetings Held in Phoenix, Arizona

Executive Board Response as Discussed at the Executive Board Meeting

Phoenix, Arizona
August 12, 2004

STANDING COMMITTEES

Food Protection Trends

Recommendations to the Executive Board:

1. To expand the concept of the "Thoughts on Food Safety" column to include Food Quality Thoughts, i.e., "Thoughts on Food Quality and Safety."
   Board Response: The Board cautions that changing the name of this column will not improve submissions. It is suggested that quality issues could also be covered in the column titled, "Thoughts on Food Safety" and that the column should remain with its present name.
2. Solicitations for "Thoughts on Food Quality and Safety" should be both invited and solicited via requests from the Scientific Editor to readership.
   Board Response: The Board requests that *FPT* Management Committee reconvene an active, subcommittee to solicit columns and to keep this column ("Thoughts on Food Safety") as an invited column.
3. To consider implementing accommodations to accept online submission of papers for publication in *FPT*.
   Board Response: Agree.
4. That it be made possible for the membership to download full articles from *FPT* from the IAFP Web site.
   Board Response: The Board asks for clarification of the intent of this recommendation. It is planned to make *FPT* articles available on the IAFP Web site one year after publication.
5. To confirm Ed Zottola's appointment to 4-year term as *FPT* Scientific Editor.
   Board Response: Agree.

Journal of Food Protection

Recommendations to the Executive Board:

1. That the instructions for selection of subscription solely to *JFP* Online be clarified.
   Board Response: The Board will ask the IAFP staff to look into this and report to the Board.
2. That approval be granted for extension of the term for Michael Davidson as Scientific Editor for a further 4 years.
   Board Response: Agree.
3. That the practicality and financial implications of contemporary systems for online review of papers be re-evaluated.
   Board Response: The Board will ask the IAFP staff to look into this and report to the Board.
4. That the scope of *JFP* be amended to discourage papers without a "food protection" context.

Board Response: The Board asks that the *JFP* Management Committee revise the scope appropriately and submit to the Board for approval.

5. That a 4th Scientific Editor be appointed, noting that a recent selection process for *FPT* had turned up several excellent candidates.
Board Response: The Board and staff will monitor the manuscript submission rate closely and look to the Scientific Editors for input on workload capacities.

Program

Recommendations to the Executive Board: None.

SPECIAL COMMITTEES

3-A Committee on Sanitary Procedures

Recommendations to the Executive Board: None.

Audiovisual Library

Recommendations to the Executive Board: None.

Awards

Recommendations to the Executive Board:

1. None at this time, but may have suggestions during this current year, prior to awards selection process in early 2005.
Board Response: Agree.

Communicable Diseases Affecting Man

Recommendations to the Executive Board:

1. We proposed that the new name for the committee be Committee on the Control of Foodborne Illness.
Board Response: Agree. The Committee name change will be effective immediately and the IAFP Bylaws will be amended at the 2005 IAFP Business Meeting to reflect this change.

2. The draft paper [on food worker hygiene] was reviewed and the committee will publish it in *FPT* or *JFP* in up to five parts beginning shortly with the first and second parts.
Board Response: The Board commends the Committee's efforts on this important paper and recommends publication in *Food Protection Trends.*

3. The committee proposes to revise the [Foodborne] manual beginning in 2005. Sections on bioterrorism will be added as well as other needed additions and corrections.
Board Response: The Board encourages the revision of the "Procedures to Investigate Foodborne Illness" and recommends integration of the subject matter of intentional contamination of food throughout the manual rather than concentrating this topic into one chapter.

Constitution and Bylaws

Recommendations to the Executive Board:

1. Add Membership Committee as Special Committee, and add new Awards.
Board Response: Agree. There will be a number of minor changes to the Bylaws to be voted on at the 2005 IAFP Business Meeting.

2. The Committee recommends the proposed changes that were tabled [at the 2003 IAFP Business Meeting] not be included in the IAFP Bylaws.
Board Response: Agree. [Note–The IAFP Membership did not approve the tabled changes from the 2003 IAFP Business Meeting.]

Foundation Fund

Recommendations to the Executive Board:

1. That the funds from the Foundation be put into a separately managed account to increase yield.
Board Response: Agree. The Board asks the Foundation Fund Committee to submit an investment policy for Board approval.

2. The Committee recommends that the amount of speaker travel supported by the Foundation be increased to 10% of the Foundation's projected annual revenue.
Board Response: Agree. [Providing that the Foundation Fund Committee agrees

with the wording of this recommendation.]

3. The Committee recommends that the Foundation Fund Committee Member's term of appointment be changed from 2-years to 3-years.

   Board Response: Agree. This change will be included in Bylaws changes to be voted on by the Membership at the 2005 IAFP Business Meeting.

Nominating

Recommendations to the Executive Board: None.

Past Presidents'

Recommendations to the Executive Board:

1. David Tharp, Executive Director should notify the Past Presidents' Committee Chair of any IAFP Award category without nominees when four weeks are left in the nomination period. The Past Presidents' Committee will make nominations for those Awards with nominations.

   Board Response: Agree.

2. Do not schedule the Past Presidents' Committee meeting at the same time as the Foundation Fund and Constitutions and Bylaws Committees. Schedule the other two Committees at 3:00 – 4:00 p.m. and Past Presidents' at 4:00 – 5:00 p.m.

   Board Response: Agree. Adjustments will be made to the Committee meeting schedule for 2005.

PROFESSIONAL DEVELOPMENT GROUPS

Applied Laboratory Methods

Recommendations to the Executive Board:

1. Proposed Workshops for 2005: (1) To Use or Not to Use: Practical Method Validation – Co-convenors Christine Aleski, George Wilson, (2) Out of the File Cabinet, Into Use: Real World Experience with Trending Data – Organizer Pat Rule.

   Board Response: The Program Committee will review your proposals and notify you about their status.

2. Proposed Symposium for 2005: (1) Sample preparation methods – Co-convenors Phillip Combs and LeeAnn Jacobs, (2) Indicator Organisms: So what?!? – Co-convenors Kelly Stevens, and Jeff Kornacki.

   Board Response: The Program Committee will review your proposals and notify you about their status.

3. Work with IAFP to enhance Web page for the Applied Laboratory Methods PDG on the IAFP Web site.

   Board Response: Agree.

Dairy Quality and Safety

Recommendations to the Executive Board:

1. To improve participation from NCIMS committee members, it is requested that meeting room space be provided for NCIMS committees as was done in past years.

   Board Response: Agree. Meeting space is made available to non-profit groups such as NCIMS on a first come, first served basis. Contact David Tharp, Executive Director, at the IAFP office to schedule meetings in conjunction with future IAFP Annual Meetings.

Food Safety Network

Recommendations to the Executive Board:

1. List meeting attendees by organization/company name, in addition to the alphabetical listing in the list of attendees.

   Board Response: The IAFP staff can accommodate these requests on a case-by-case basis. To implement a second sort on the list will result in twice the printing cost.

Food Sanitation

Recommendations to the Executive Board:

1. Proposed symposium for 2005: "Cleaning and Sanitizing in Food Operations." Sessions to include: (1) Pathogens in Food Operations: Their Source and Level, (2) Food Contact Surface Contamination and Pathogen Transfer, (3) Cleaning and Sanitizing the Niches and Removing Biofilms

in Foodservice, the Chemics, the Procedures their Effectiveness, (4) Surfaces to Determine Safety and Tracking Pathogens in a Facility, (5) HACCP Process Design and Management of Cleaning and Sanitizing Process, and (6) Shortening Your Sanitation and Maintaining the Quality. Suggested Convenor: Pete Snyder. Moderators: Jeff Varcoe and Zeb Blanton. Assist with developing symposium program: Adel Makdesi, Dennis Bogart, Charles Giambrone, Mark Moorman, Brian Anderson, and Jeff Varcoe.
Board Response: The Program Committee will review your proposals and notify you about their status.

2. Suggest changing the name of Food Sanitation PDG to Food Hygiene/ Sanitation PDG.
Board Response: Agree, but with a minor modification to read "Food Hygiene & Sanitation PDG."

3. Change the mission of the PDG to " To provide information on the developments in hygiene/sanitation in the food industry."
Board Response: Agree, but with same modification as in number 2 (insert "&" in place of "/").

Food Toxicology and Food Allergens

Recommendations to the Executive Board:

1. To become a Professional Development Group of IAFP on Food Toxicology and Food Allergens.
Board Response: Agree.

2. Proposed Symposium for 2005 – Food Toxicology and Food Allergens.
Board Response: The Program Committee will review your proposal and notify you about its status.

Fruit and Vegetable Safety and Quality

Recommendations to the Executive Board: None.

Meat and Poultry Safety and Quality

Recommendations to the Executive Board: None.

Microbial Risk Analysis

Recommendations to the Executive Board:

1. There were no formal recommendations to the Executive Board, other than to endorse the nomination of Aamir Fazil as the vice chair for the PDG.
Board Response: Agree.

Outreach Education

Recommendations to the Executive Board:

1. The Outreach Education Professional Group requests that the Executive Board review again the role of the IAFP and PDG Web site in presenting information. The Outreach Education PDG would like to see pamphlets posted on the IAFP Web site as PDF documents with the option to purchase printed pamphlets.
Board Response: The Board will ask staff to review the revenue flow generated from pamphlet sales and report to the Board so that the Board can make an informed decision.

Retail Food Safety and Quality

Recommendations to the Executive Board:

1. PDG recommends that a listserv be established with the IAFP Webmaster for "hot topic" discussions and to facilitate member communications. Additionally, a listserv could limit the problems some members have with their E-mail. Specifically, some members have difficulty receiving E-mails that contain many recipients or E-mail attachments that may get filtered out by some computer programs.
Board Response: The Board will ask staff to look at the expense involved in setting up listserv operations and report to the Board.

Seafood Safety and Quality

Recommendations to the Executive Board: None.

Student

Recommendations to the Executive Board: None.

Viral and Parasitic Foodborne Disease

Recommendations to the Executive Board:

1. Recommend that the Board consider shortening PDG meetings for select groups that take only an hour to complete their business, or else consider staggering meeting times so that individuals can attend multiple meetings, if they so desire.

Board Response: The Board recommends keeping the two-hour time period for Committee and PDG meetings but will make adjustments to stagger the start times.

Water Safety and Quality

Recommendations to the Executive Board: None.

AFFILIATE COUNCIL

Recommendations to the Executive Board: None.

IAFP Foundation Fund Silent Auction Results

High Bidder		Item	Donated by
Henry	Atherton	Georgia Gift Basket	Georgia Association for Food Protection
Henry	Atherton	Kansas Survival Kit	Kansas Environmental Health Association
Donna	Bahun	Food Safety Partner Mickey	Walt Disney World
Dane	Bernard	Penn State Gift Basket	Cathy Cutter
Don	Breiner	Antique Milk Bottle	Capitol Vial
Don	Breiner	Electric Lionel Train	Zep Manufacturing
Robert	Brooks	Central Market Gift Basket	Texas Association for Food Protection
Steven	Brown	1/2 Gallon New York State Pure Maple Syrup	New York State Association for Food Protection
Steven	Brown	US Flag	Capital Area Food Protection Association
John	Bruhn	Plum Ridge Wine	Metropolitan Association for Food Protection
Stephen	Buck	Dairy Herd Improvements Cookbook	Capitol Vial
Margaret	Burton	IAFP 2005 Registration	International Association for Food Protection
Sid	Camp	Cranberry Cream Ridge Wine	Metropolitan Association for Food Protection
Sid	Camp	Dr. Frank Semi-Dry Riesling	Steve Murphy/New York Association for Food Protection
Sid	Camp	Lafayette Chardonay	Steve Murphy/New York Association for Food Protection
Stefano	Colombo	Food Microbiology: Fundamentals and Frontiers	American Society for Microbiology
R.H.	Deibel	Mirror Wall Hanging	Arizona Environmental Health Association
Carol	Deibel	Steven D. Cale Wildlife Print	Indiana Environmental Health Association
Carol	Deibel	Taste of Chicago Gift Certificate	Associated Illinois Milk, Food and Environmental Sanitarians
Joseph	Disch	Wiemer Dry Reisling	Steve Murphy/New York Association for Food Protection
Ed	Donnell	2 Australian Mugs with Matching Tray	Jill Gebler
Warren	Dorsa	Bausch & Lomb Student Microscope	Texas A & M University Department of Animal Science
Mary Ann	Dowd	International Food Safety Icons CD	International Association for Food Protection
Peter	Esko	Premium Export Brandy	Alex Von Holy
Harold	Ewell	Taste of Chicago Gift Certificate	Associated Illinois Milk, Food and Environmental Sanitarians
Wilbur	Feagan	American Royal	Fred Weber
Wilbur	Feagan	Country Cured Ham	Carolinas Association for Food Protection
Wilbur	Feagan	Country Cured Ham	Carolinas Association for Food Protection
Wilbur	Feagan	Missouri Ham	Missouri Milk, Food and Environmental Health Association
John	Foster	Junior Johnson #3 NASCAR Print	Carolinas Association for Food Protection
Ryan	Galasso	The Food Safety Professional Guide Set	International Association for Food Protection
Marc	Glogovsky	Stuffed Oscar Mayer Weinermobile	Kraft
Farrah	Goering	Almondberry Cream Ridge Wine	Metropolitan Association for Food Protection
Paul	Hall	64" Cultured Pearl Necklace	David & Connie Tharp
Paul	Hall	Brazil Cook's Tour	Brazil Association for Food Protection
Paul	Hall	Canadian Ice Wine	Schneider Foods
Paul	Hall	Ontario Ice Wine	Ontario Food Protection Association
Gordon	Hayburn	UW River Falls T-Shirt	PC Vasavada/UW River Falls
Joe	Heidenreich	Food Science Institute Polo Shirt	Food Science Institute Kansas State University
Dave	Horowitz	Florida Wine	Florida Association for Food Protection
Lisa	Hovey	Blueberry Cream Ridge Wine	Metropolitan Association for Food Protection
Gala	Jaramillo	4-Frank Lloyd Wright Books	David Tharp
Gala	Jaramillo	Brazilian Folk Art	Brazil Association for Food Protection
Anna	Lammerding	Nascow Stockyard	Fred Weber
Loralyn	Ledenbach	Moo-nay's Garden	Fred Weber
Jennifer	Lee	Happy Birthday to MOO	Fred Weber
Vickie	Lewandowski	3-Month Washington Cougar Gold Cheese	Washington Association for Food Protection
Vickie	Lewandowski	Muir Wood Monterey	California Association of Dairy and Milk Sanitarians
Vickie	Lewandowski	Polish Bison Vodka	Upper Midwest Dairy Association
Kristin	Marshall	UW River Falls T-Shirt	PC Vasavada/UW River Falls

High Bidder		Item	Donated by
Pattie	McNiel	Golden Gate Vintners Merlot	California Association of Dairy and Milk Sanitarians
Indaue	Mello	Cranberry Cream Ridge Wine	Metropolitan Association for Food Protection
Indaue	Mello	Foodborne/Waterborne Booklets	International Association for Food Protection
Indaue	Mello	Preharvest and Postharvest Food Safety	Blackwell Publishing
Indaue	Mello	South African Wild Cream Liqueur	Alex Von Holy
Barry	Michaels	Alf R. Biecke's Norway	Food Diagnostics
Steve	Murphy	Kendall-Jackson Collage Zinfandel-Shiraz	California Association of Dairy and Milk Sanitarians
Chris	Newcomer	Dairy Herd Improvements Cookbook	Capitol Vial
Karl	Olson	The Saying of the Vikings	Food Diagnostics
Glenda	Overfelt	Florida Association Apron	Florida Association for Food Protection
Mickey	Parish	Ontario Ice Wine	Ontario Food Protection Association
Laurie	Post	Canadian Ice Wine	Schneider Foods
Vincent	Radke	I'm Just Here for the Food	Wegmans Food Markets
Kathleen	Rajkowski	5 Lbs. New York State Sharp Cheddar Cheese	New York State Association for Food Protection
Henry	Rajkowski	WEHA T-Shirt	Wyoming Environmental Health Association
Agustin	Ramos Piza	MEHA Sanitarian's Ready Reference Manual	Michigan Environmental Health Association
Ana	Ramos	UW River Falls T-Shirt	PC Vasavada/UW River Falls
Fred	Reimers	MEHA Sanitarian's Ready Reference Manual	Michigan Environmental Health Association
David	Rodriguez-Lazaro	UW River Falls T-Shirt	PC Vasavada/UW River Falls
Mansour	Samadpour	Micro Organisms in Food 7	Springer
Javier	San Juan	Stuffed Oscar Mayer Weinermobile	Kraft
Javier	San Juan	Team USA World Rugby Union Cup Shirt	United Kingdom Association for Food Protection
Allen	Sayler	Embroidered Wine Holder and Wine	Southern California Association for Food Protection
Allen	Sayler	The Few, the Proud, the Moorines	Fred Weber
Thomas	Schwarz	Gear for Your Kitchen	Wegmans Food Markets
L.	Shelef	Monthaven Coastal Pinot Noir	California Association of Dairy and Milk Sanitarians
Gaylord	Smith	Disco Cow	Fred Weber
Gloria	Swick-Brown	Lucas Cayuga White	Steve Murphy/New York Association for Food Protection
Ewen	Todd	Embroidered Towels with Phoenix Logo	Southern California Association for Food Protection
Ewen	Todd	Hand Painted Canoe Paddles with Michigan Outdoor Scenes	Michigan Environmental Health Association
Ewen	Todd	IAFP Long Sleeved Shirt	IAFP
Melissa	Tucker	Masks of Korea	Korea Association of Milk, Food, and Environmental Specialists
Aaron	Uesugi	Cooking Utensils	Florida Association for Food Protection
Aaron	Uesugi	Fans, Pen and Bag	Daikin Environmental Laboratory
Alecia	Viera	Bath & Body Works Gift Basket	Kentucky Association of Milk, Food & Environmental Sanitarians
Luis Vivas	Alegre	HACCP Training Book	Food Processors Institute
Fred	Weber	Leaping Horse Vineyards Cabernet Sauvignon	California Association of Dairy and Milk Sanitarians
Fred	Weber	Monsieur Omo's Red Sunshine	California Association of Dairy and Milk Sanitarians
Lisa	Weddig	HACCP Training Resource Pack	Weber Scientific
Ron	Weiss	Engel Cellars Zinaz	California Association of Dairy and Milk Sanitarians
Ron	Weiss	Pepperwood Grove Syrah	California Association of Dairy and Milk Sanitarians
Ron	Weiss	Napa Ridge Coastal Zinfandel	California Association of Dairy and Milk Sanitarians
Ron	Weiss	Napa Valley Leaping Lizard Zinfandel	California Association of Dairy and Milk Sanitarians
Ron	Weiss	Paso Robles Cross Point Merlot	California Association of Dairy and Milk Sanitarians
Ron	Weiss	Vintners Reserve California Zinfandel	California Association of Dairy and Milk Sanitarians

Raised $4,644

Exhibitors of IAFP 2004

★ Sustaining Member

★3-A Sanitary Standards, Inc.
McLean, VA
Phone: 703.790.0295
Fax: 703.761.6284
www.3-a.org

★3M Microbiology
Saint Paul, MN
Phone: 800.328.1671
Fax: 651.737.1994
www.3m.com/microbiology

★ABC Research Corporation
Gainesville, FL
Phone: 352.372.0436
Fax: 352.378.6483
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ACCUGENIX®
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Phone: 800.886.9654
Fax: 302.292.8468
www.accugenix.com

Advanced Analytical Technologies, Inc.
Ames, IA
Phone: 515.296.6600
Fax: 515.296.6789
www.aati-us.com

Advanced Instruments, Inc.
Norwood, MA
Phone: 800.225.4034
Fax: 781.320.8181
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Aerotech P&K
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Phone: 800.651.4802
Fax: 623.780.7695
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AES – Chemunex, Inc.
Princeton, NJ
Phone: 609.497.0166
Fax: 609.497.7307
www.aeschemunex.com

Alex C. Fergusson, Inc.
Frazer, PA
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Fax: 610.644.8240
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aLF Ventures, LLC
Salt Lake City, UT
Phone: 801.961.1030
Fax: 801.961.1031
www.activinlf.com

Alpha Biosciences, Inc.
Baltimore, MD
Phone: 410.467.9983
Fax: 410.467.5088
www.alphabiosciences.com

American Proficiency Institute
Traverse City, MI
Phone: 800.333.0958
Fax: 231.941.7287
www.foodpt.com

AOAC International
Gaithersburg, MD
Phone: 800.379.2622
Fax: 301.924.7089
www.aoac.org

Applied Biosystems
Foster City, CA
Phone: 800.874.9868
Fax: 650.572.2743
www.appliedbiosystems.com

★ASI Food Safety Consultants, Inc.
St. Louis, MO
Phone: 800.477.0778
Fax: 314.725.4910
www.asifood.com

ASM Press
Washington, DC
Phone: 202.942.9316
Fax: 202.942.9342
www.asm.org

★BD Diagnostics
Sparks, MD
Phone: 410.316.4000
Fax: 410.316.4906
www.bd.com

Best Sanitizers, Inc.
Penn Valley, CA
Phone: 888.225.3267
Fax: 530.432.0752
www.bestsanitizers.com

★BioControl Systems, Inc.
Bellevue, WA
Phone: 800.245.0113
Fax: 425.603.0080
www.biocontrolsys.com

★bioMérieux, Inc.
Hazelwood, MO
Phone: 800.634.7656
Fax: 800.657.3053
www.biomerieux-usa.com

★Bio-Rad Laboratories
Hercules, CA
Phone: 800.4BIORAD
Fax: 510.741.5630
www.foodscience.bio-rad.com

Bioscience International
Rockville, MD
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College Park, MD
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Fax: 301.436.2605
www.cfsan.fda.gov

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Fax: 516.576.1410
www.800certlab.com

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Fax: 978.687.9216
www.charm.com

Copan Diagnostics, Inc.
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Fax: 909.549.8850
www.copanusa.com

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Fax: 888.807.5833
www.handgards.com

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Fax: 202.296.6547
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www.sqfi.com

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Fax: 610.436.1761
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★**Warnex Diagnostics Inc.**
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Fax: 450.669.2784
www.warnex.ca

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Walt Disney World

Warren Analytical Laboratory

Weber Scientific

Thank You!

Call for Nominations
2005 Secretary

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

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

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

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

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

Nominations close November 1, 2004.

International Association for Food Protection®

International Association for Food Protection®

Award Nominations

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

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

Nominations deadline is March 14, 2005. You may make multiple nominations. All nominations must be received at the IAFP office by March 14, 2005.

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

Nominations will be accepted for the following Awards:

Black Pearl Award — Award Showcasing the Black Pearl

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

Sponsored by Wilbur Feagan and F&H Food Equipment Company

Fellow Award — Distinguished Plaque

Presented to Members who have contributed to IAFP and its Affiliates with distinction over an extended period of time.

Honorary Life Membership Award — Plaque and Lifetime Membership in IAFP

Presented to Members for their devotion to the high ideals and objectives of IAFP and for their service to the Association.

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

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

Sponsored by Zep Manufacturing Company

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

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

Sponsored by Nasco International, Inc.

Educator Award — Plaque and $1,000 Honorarium

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

Sponsored by Nelson-Jameson, Inc.

Sanitarian Award — Plaque and $1,000 Honorarium

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

Sponsored by Ecolab, Inc., Food and Beverage Division

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

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

Sponsored by Weber Scientific

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

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

Sponsored by Unilever – Safety and Environmental Assurance Centre

Food Safety Innovation Award — Plaque and $2,500 Honorarium

Presented to an individual or organization for creating a new idea, practice, or product that has had a positive impact on food safety, thus, improving public health and the quality of life.

Sponsored by 3M Microbiology

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

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

Sponsored by National Food Processors Association

Call for Abstracts

IAFP 2005

The Association's 92nd Annual Meeting

August 14–17, 2005

Baltimore, Maryland

General Information

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

Presentation Format

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

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

Instructions for Preparing Abstracts

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

Abstract Submission

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

Abstracts must be received no later than January 12, 2005. Return the completed abstract form through one of the following methods:

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

Selection Criteria

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

Rejection Reasons

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

Projected Deadlines/Notification

Abstract Submission Deadline: January 12, 2005. Submission Confirmations: On or before January 13, 2005. Acceptance/Rejection Notification: February 16, 2005.

Contact Information

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

Program Chairperson

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

Abstract Form

DEADLINE: Must be Received by January 12, 2005

(1) Title of Paper _____

_____

(2) Authors _____

_____

(3) Full Name and Title of Presenter _____

_____

(4) Institution and Address of Presenter _____

_____

(5) Phone Number _____

(6) Fax Number _____

(7) E-mail _____

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

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

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

☐ Risk Assessment ☐ Education ☐ General Microbiology and Sanitation

☐ Antimicrobials ☐ Pathogens ☐ Dairy

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

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

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

Call for Entrants in the Developing Scientist Awards Competitions

Supported by the International Association for Food Protection Foundation

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

Purpose

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

Presentation Format

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

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

General Information

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

Judging Criteria

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

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

Judging criteria will be based on the following:

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

Finalists

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

Awards

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

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

Policy on Commercialism

for Annual Meeting Presentations

1. INTRODUCTION

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

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

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

2. TECHNICAL CONTENT OF SUBMISSIONS AND PRESENTATIONS

2.1 Original Work

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

2.2 Substantiating Data

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

2.3 Trade Names

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

2.4 "Industry Practice" Statements

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

2.5 Ranking

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

2.6 Proprietary Information (See also 2.2.)

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

2.7 Capabilities

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

3. GRAPHICS

3.1 Purpose

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

3.2 Source

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

3.3 Company Identification

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

3.4 Copies

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

4. INTERPRETATION AND ENFORCEMENT

4.1 Distribution

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

4.2 Assessment Process

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

4.3 Author Awareness

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

4.4 Monitoring

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

4.5 Enforcement

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

4.6 Penalties

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

NEW MEMBERS

CANADA

Pallavi Bhatia
V & L Information Resources Corp.
Markham, Ontario

Cathy Blum
Scotian Gold Co-operative Limited
Coldbrook, Nova Scotia

Yvan P. Cote
Warnex Research Inc.
Laval, Quebec

HUNGARY

Katalin Perkatai
MikroMikoMed Ltd.
Budapest

MALTA

Sandro Sammut
University of Malta
Birkirkara

MEXICO

Maria Uxua Alonso Fresan
Universidad Autonoma Del Estado
De Mexico
Metepec

UNITED KINGDOM

Andrew D. Snelson
Cadbury Limited
Frodsham, Cheshire

UNITED STATES

ARKANSAS

Shadrick D. Adams
Ecolab
Rogers

FLORIDA

Ryan E. Harrolle
Outback Steakhouse
Riverview

ILLINOIS

Allison E. Dietze
Charleston

Scott Johnson
Johnson Associates, Inc.
Wheaton

Patricia Tinman
Praxair
Burr Ridge

NEW YORK

Yvonne C. Chan
Cornell University
Ithaca

Renata Ivanek
Cornell University
Ithaca

Trudy Pickerd
Perfex Corporation
Poland

OREGON

Julie M. Larson Bricher
Food Safety Magazine
McMinnville

PENNSYLVANIA

Christine L. Bedillion
NSF International
Pittsburgh

SOUTH DAKOTA

LuAnn M. Ford
City of Sioux Falls
Sioux Falls

TEXAS

Cecelia I. Cockerell
Bobby Cox Companies, Inc.
Midland

UPDATES

Rhona Applebaum Accepts Chief Regulatory Officer at Coca-Cola Co.

Rhona Applebaum recently accepted a new position at Cola-Cola Co. as chief regulatory officer. Previously, Ms. Applebaum was the executive vice president, scientific & regulatory affairs at the National Food Processors Association.

Martin B. Cole Takes Position as Director of the National Center for Food Safety and Technology

The National Center for Food Safety and Technology at the Illinois Institute of Technology announced Martin Cole as the Center's new director. Dr. Cole's previous position was as the deputy chief executive of Food Science Australia. Dr. Cole has over 10 years experience within the Codex Food Hygiene Committee, and is the chairman of the International Commission for the Microbiological Safety of Foods. Dr. Cole was this year's Ivan Parkin Lecturer at IAFP 2004 in Phoenix, AZ.

Nanoscale Chemical Sensors

New types of chemical sensors for environmental monitoring, food safety or security applications could be based on nanotechnology, according to Frank Osterloh, an assistant professor of chemistry at UC Davis. "Nanomaterials are very well suited for chemical sensor applications, because their physical properties often vary considerably in response to changes of the chemical environment," Osterloh said. "Because nanomaterials can be made up of structures just a few atoms across, just a few molecules of chemical can trigger a response," he said. Osterloh, with graduate student Xiubin Qi and former student Jason Martino, discovered that nanowires made of lithium, molybdenum and selenium atoms show changes in electrical resistance of up to 200 percent when exposed to vapors of organic solvents. By depositing the nanowires between two conductors, they made a simple chemical sensor.

By attaching chemical groups to the nanowires, the researchers could modify the sensor to measure the acidity of a solution. The team is now investigating if this "programming" property can be extended to make sensors for the detection of explosives or environmental contaminants such as lead in drinking water, Osterloh said.

The work was presented at the 228th national meeting of the American Chemical Society in Philadelphia, August 22–26. Osterloh's laboratory is also experimenting with nanoscale chemical sensors based on materials that change color; nanomaterials that can be manipulated in magnetic fields; and luminescent materials.

New Food Safety Detection System Speeds Pathogen Detection

Collaborative work commissioned by safefood, the Food Safety Promotion Board, has resulted in the validation and accreditation of a DNA-based commercial system, ABAX, for the rapid and accurate detection of *Salmonella* and *Listeria* pathogens. Using the new system, testing for *Salmonella* now takes 24 hours compared with four days using the conventional culture methods. *Listeria* testing time also reduced from seven days to 48 hours. A survey of 500 different food samples confirmed that this new testing system is as sensitive as conventional methods in detecting both of these foodborne pathogens; therefore, offering the general public extra confidence in the protection of public health.

This research was carried out by the Food Microbiology Laboratory, St. Finbarr's Hospital, Cork and the Public Health Laboratory, Waterford Regional Hospital as part of the "synergy" program, funded by safefood. The purpose of this program is to promote ongoing research and development and also to establish links between laboratories on the island of Ireland.

Commenting on the research, Thomas Quigley, director science and technical, safefood said, "We were very excited to see the results of this 'synergy' project. This new system will see the detection time of two potentially dangerous pathogens substantially reduced to enable speedier containment of any foodborne outbreaks offering the general public even greater confidence in the food chain and the protection of public health."

Commenting on the findings, Noel Shanaghy, chief medical scientist of the Waterford Public Health Laboratory said, "As well as the introduction of a new accredited rapid test, both laboratories benefited from participating in this project and the experience gained from working together formed relationships and links which will be valuable for further cooperation." safefood anticipates that the two laboratories who participated in this project will now be in a position to pass on the knowledge and expertise gained to other laboratories throughout the island, ensuring a quick and reliable turnaround for *Salmonella* and *Listeria* testing throughout the country.

Bioinformatics Center to Become Weapon against Deadly Diseases

A computer database designed to help biomedical scientists identify and exploit the weak spots in scores of deadly microorganisms will be established with an $18 million contract from the National Institute of Allergy and Infectious Diseases (NIAID) of the National Institutes of Health.

Overseeing the effort will be the Computation Institute, a joint effort between the University of Chicago and Argonne National Laboratory, and the Fellowship for Interpretation of Genomes, a non-profit organization specializing in bioinformatics tool development and comparative genomics research.

They will use the funds to set up a National Microbial Pathogen Data Resource Center to help scientists to accelerate their research into the biology and evolution of deadly microorganisms and develop methods for their control.

The new center will provide infectious disease researchers a single web-based entry point to all relevant organism-related data necessary for their advanced research. The genomes (genetic maps) of hundreds and eventually thousands of microorganisms will be available for integrated analysis.

"The center will directly support the national effort to develop new vaccines, therapeutics and diagnostics for emerging and re-emerging infectious diseases," said Computation Institute director Rick Stevens, who will co-direct the center.

"A central goal of the center will be to gather all existing data on these organisms and embed this data within a framework that will support researchers in their efforts to understand them," said center co-director Ross Overbeek.

Working together at the center will be a team of experts in biology, biophysics, microbiology, computer science and bioinformatics (the application of mathematics and computer science to biological problems). Stevens, a professor in computer science at the University of Chicago and director of the mathematics and computer science division at Argonne, specializes in high-performance computing, collaborative and visualization technologies and computational science, including computational biology.

Overbeek, a pioneer in the development of comparative genomic databases (PUMA, WIT, ERGO and the SEED), is interested in extracting deeper understanding from analysis of the growing body of genomic data. In 2003 he co-founded the Fellowship for Interpretation of Genomes.

Among the scientists who will directly benefit from the data center will be the eight new Regional Centers of Excellence for Biodefense and Emerging Infectious Diseases that were funded last September by the NIAID of the National Institutes of Health. One such center will be operated at Argonne National Laboratory by the University of Chicago. The data center will assist researchers through the application of mathematics and computer science to biological problems. "Bioinformatics and comparative analysis will drive the rapid advances needed to address the growing body of threats associated with pathogenic microorganisms. These advances will occur, however, only in the presence of effective cooperation between experimental research and the bioinformatics efforts," Stevens said.

To ensure such cooperation, the center's outreach and training for experimental researchers will be led by the National Center for Supercomputing Applications (NCSA) of the University of Illinois at Urbana-Champaign. "This group has had extensive experience in outreach to researchers in the biological sciences," Stevens said. Jonathan Silverstein, M.D., Director of the Center for Clinical Information at the University of Chicago, will work with NCSA to develop outreach for clinical practitioners.

Although the NMPDR will contain numerous genomes, it will focus its work on eight pathogens: *Staphylococcus aureus*, which causes a variety of illnesses, including pneumonia and meningitis; *Streptococcus pyogenes*, which causes illnesses such as scarlet fever, toxic shock syndrome and necrotizing fasciitis (flesh-eating disease); *Streptococcus pneumonia*, which causes pneumonia, meningitis and osteomyelitis, among other maladies; *Vibrio cholerae*, the bacterium that causes cholera; *Vibrio parahemolyticus*, a bacterium associated with oysters and seafood that causes gastrointestinal illness in humans; *Vibrio vulnificus*, another bacterium associated with shellfish and seafood that causes a diarrheal infection; *Listeria monocytogenes*, a bacterium that causes listeriosis, an infection that occurs mainly in newborn infants, the elderly and patients with a weakened immune system; *Campylobacter jejuni*, a bacterium that commonly causes diarrhea.

How New Diseases from Insects Hit People Like the Plague

Scientists have traced the first steps in the way some new diseases emerge, and how harmless bacteria living in insects become dangerous disease-causing bugs, which can affect humans, like the plague or anthrax.

Researchers from the University of Bath presented their results at the Society for General Microbiology's 155th Meeting (September 8, 2004) at Trinity College Dublin. The scientists believe that because of the similarities between human and insect immune systems, any bacteria that have successfully evolved to infect insects already have a head start if they attack people. "There are millions of bacteria in the environment, and sometimes they cause 'emerging diseases' by attacking people — in other words a new type of disease which we haven't seen before. But this is not a completely new phenomenon, the bacteria may have been around for centuries, it is just that a new strain is suddenly able to infect humans as well as other animals. We need to understand the mechanism that the bacteria are using to change their disease-causing ability if we are to successfully treat emerging diseases before they get out of control and become epidemics," says Dr. Nick Waterfield of Bath University.

A very infectious bacterium that attacks insects, *Bacillus thuringiensis*, is closely related to the microbe that causes anthrax in humans, a bacterium called *Bacillus anthracis*. Similarly the plague bacterium, *Yersinia pestis*, evolved relatively recently from an ancestor, *Yersinia pseudotuberculosis*, by passing through the fleas which carried it, and moved across rats to humans. "We believe that these interactions between bacteria and insects may significantly contribute to the evolution of human diseases. There are two main ways insects help the bacteria: by passing microbes directly into our bloodstream when they bite us — like fleas or ticks; and by acting as a reservoir to cook up future human diseases. The picture is further complicated by climate change, which seems to be altering the range of places insects can survive and breed, bringing new insects which can carry ancient diseases into the Northern hemisphere," says Dr. Waterfield.

The scientists have been studying a newly recognized but non-lethal bacterium called *Photorhabdus asymbiotica* that has been identified by hospitals in both the United States and Australia, which provides a safe system to study the problem. This bacterium seems to have evolved from the well-known insect-disease causing bacteria, *Photorhabdus luminescens* and *Photorhabdus temperata*, which attack insects with the help of their nematode worm partners.

The researchers hope that a better understanding of the role of insects in the evolution of diseases will allow scientists to identify situations that could act as a source of new infection.

Bacteria and Foodborne Diseases: Safety Can be Influenced at Home and in Foodservice

While outbreaks associated with commercially processed food receive widespread public attention, a greater number of unreported individual cases of foodborne illness occur in restaurants and in the home. Data assembled by the not-for-profit scientific society Institute of Food Technologists from US public health agencies reveal that inadequate home food storage and handling practices are major contributors to foodborne illness, and proper handling, cooking, and storage practices in foodservice operations and at home can prevent the majority of foodborne illnesses, as noted in IFT's newly published "Scientific Status Summary, Bacteria Associated with Foodborne Diseases."

It is impossible to create a risk-free food supply. But the summary lists principal control measures for preventing foodborne disease. They are: Adequate cooking and cooling; avoidance of cross contamination of cooked or ready-to-eat foods by improperly cleaned utensils and cutting surfaces after contacting undercooked or raw foods; avoidance of undercooked or contaminated raw foods, and avoidance of contamination of foods during handling by infected food handlers. The summary maintains that food preparers have the responsibility upon purchase of the food to maintain control measures, ensuring safety.

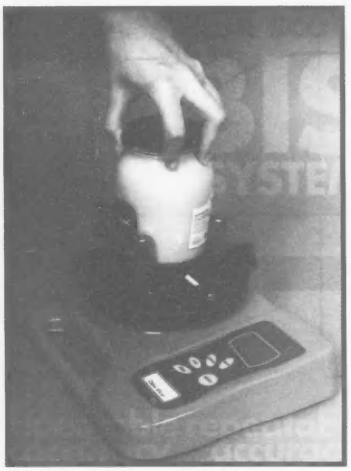
Evaluations of the foodservice sector and noted within the summary reveal that education of the preparer and server with an emphasis on hygiene is the best preventive measure. The summary notes that with the majority of foodservice workers under 30 years old, inexperienced, and on the job less than a year, finding and educating them while they are actively working is difficult.

Consumer education and increased regulatory control of foodservice establishments through inspection and strict enforcement of proper food handling practices

probably have the greatest chances for success in controlling foodborne illness, according to the data. The need for continual education of consumers and all food preparers concerning the significant hazards associated with pathogens and proper control measures is evident. Of the estimated 76 million cases of foodborne illness in the United States annually, less than 14 million stem from known origins. In 30 percent of those identified outbreaks bacteria contamination is the culprit. Bacteria most often responsible for the greatest amount of illness outbreaks are addressed in the summary.

This Scientific Status Summary follows IFT's 2002 release of "Parasites and the Food Supply." These and other IFT scientific documents are accessible at http://www.ift.org.

INDUSTRY PRODUCTS



Quantrol

New Quantrol Digital Torque Testing System Offers Greater Accuracy and Portable Testing

Quantrol™ has announced Orbis, a new line of digital torque testing systems offering repeatable accuracy to 0.5% full scale compared to conventional analog systems that offer far less accuracy—typically 2–3% full scale. In addition, the Orbis system is self-contained and the only portable system, giving users the time-saving flexibility to conduct testing on the production line rather than transporting line samples to a lab for conventional mechanical torque testing.

"Providing an easier-to-use, more accurate solution that helps manufacturers assure the integrity of tamper-evident seals and child-resistant closures on their packages is our top priority," said Jim Head, BSME, Quantrol. Head added that the Orbis system is a value-priced addition to Quantrol's existing line of Torque Testing Systems that includes Tornado, AFTI Smart Torque Sensors, and Torque Wrench Checker. "The addition of Orbis allows us to offer a wide range of torque testing technology for a broad range of bottling and packaging applications," continued Head.

The Orbis system accommodates sample sizes from 0.4 to 6.3 inches and is capable of capturing dual peak readings–first reporting torque levels at seal break and then at actual opening. Additionally, the system reports slip torque of a seal as well as bridge torque of the cap.

Orbis models are compact and enclosed in a rugged case with a convenient integrated handle for easy transporting at the production line. Features include a back-lit display to take readings in dimly lit production areas. A data output function allows torque data to be ported to a PC for collection and analysis.

Quantrol
800.368.2039
Fairmont, MN
www.quantrol.com

Ratio:Matic Dual Dispensing from Fluid Metering, Inc.

The Ratio:Matic® Series of dual head dispensers and metering pumps from Fluid Metering, Inc. provide precise dual channel fluid control for a broad range of process, production, laboratory, and OEM. Applications include instrumentation in food, medical diagnostics, electronics, analytical chemistry, and environmental monitoring.

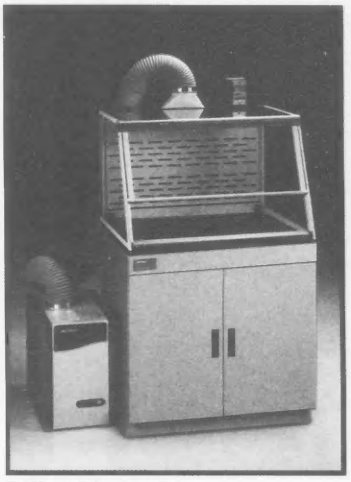
Ratio:Matic® pumps consist of two FMI pump heads direct coupled to a single variable speed drive. Each pump head is independently adjustable, and a variety of pump head sizes can be used in combinations to achieve dispensing ratios from 1:1 up to 1000:1. Ratio:Matic® pumps are ideal for dual-channel dispensing as low as 2 µL per dispense, as well as proportional metering of two fluids into a single fluid stream up to 4 L/min continuous flow. Controlling two pump heads with a single drive motor and controller provides simplicity of control, as well as, significant cost savings.

The unique design of FMI's CeramPump® utilizes one moving part, a rotating and reciprocating ceramic piston to accomplish both pumping and valving functions without valves. The piston and mated liner are made of dimensionally stable, sapphire-hard ceramics which ensure long-term, drift-free accuracy of 1% or better for millions of maintenance-free cycles.

The Ratio:Matic® Series of pumps are available in AC, DC and stepper motor drive configurations. Controllers are available ranging from simple process and quick start stepper control to programmable intelligent stepper drivers.

Fluid Metering, Inc.
800.223.3388
Syosset, NY
www.fmipump.com

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



BioControl Systems, Inc.

BioControl® Introduces Innovative Rapid Test for Chemical Concentration

BioControl Systems, Inc. announces an innovation in sanitation monitoring – a cost-effective and precise method for measuring sanitizer and cleanser solution concentrations. An industry first, the LIGHTNING MVP Conductivity Probe is a reusable probe that allows food processors to measure sanitizer concentration and conductivity with the same instrument they use to measure ATP, pH and temperature. This addition to the LIGHTNING MVP system will allow food manufacturing plants to save money and reduce risk by tightly controlling their sanitizer concentrations.

Providing a precise measurement for managing sanitizer concentration presents a significant economic benefit to end-users. Overmixing sanitizers and cleansers by even a few percentages can quickly amount to tens of thousands of dollars a year in wasted chemicals. Conversely, undermixing can endanger plant safety when the use solution does not effectively sanitize a surface. Current methods of measuring sanitizer concentration, such as chemical strips and titration kits, offer results as a range and are subjective, based on an employee-interpreted color change. This method produces an accuracy rate of only ± 25%. The LIGHTNING MVP provides a single, accurate number with variation of ± 5%–reported in parts-per-million (ppm)–which is automatically logged, creating a strong, unalterable audit trail.

"ATP measurement as an indicator of plant sanitation has been widely used throughout the food industry. We've always had the vision that the LIGHTNING MVP would provide value far beyond sanitation monitoring. By adding concentration/ppm and conductivity to its measurement capabilities, we offer an instrument that monitors both sanitation and HACCP programs reducing both cost and risk for our customers," states Philip Feldsine, president and CEO of BioControl.

The LIGHTNING MVP Conductivity Probe and its multiple uses are just two of the many innovative features of the LIGHTNING MVP system. The LIGHTNING MVP is the industry's first multi-parametric instrument to combine ATP monitoring with measurements of other common quality measurements including temperature and pH. The LIGHTNING MVP allows users to collect, analyze and report data from multiple quality indicators with a single instrument and is the only system to offer room temperature stable ATP sampling devices and in-house calibration.

BioControl Systems, Inc.
425.603.1123
Bellevue, WA
www.biocontrolsys.com

Labconco's New XPert™ Filtered Balance System Provides User Protection during Weighing Procedures

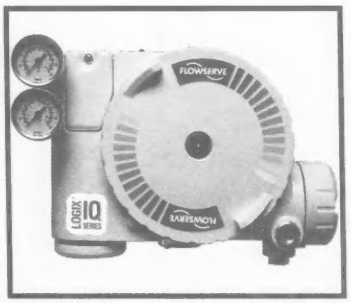
XPert Filtered Balance Systems provide user protection during weighing procedures by keeping powders and particulates frequently found in pharmaceutical, dry chemical, mold and asbestos weighing operations contained and away from the operator. The interior depth of 23" accommodates large micro and analytical balances. Containment-enhancing features include the patented CleanSweep™ air foil that allows air to sweep the work surface, the upper containment sash foil to bleed air into the enclosure to direct concentrations of contaminants away from the users' breathing zone; and a zone-perforated rear baffle that creates horizontal laminar airflow. A true bag-in/bag-out filter disposal system allows the HEPA filter to be safely removed and replaced by a certified technician.

The frame is of sturdy glacier white and gray, dry powder epoxy-coated aluminum with a steel rear panel and baffle. Tempered safety glass sash, sides and top offer excellent visibility and provide better fire, scratch and corrosion resistance than acrylic. The ergonomic 20° angled sash allows a closer view, reduces glare and provides a more comfortable operating position than vertical sashes.

The built-in blower and exhaust HEPA filter mounted in the upper plenum take up less space than a separate exhauster and filter housing would require, while isolation supports minimize blower vibration. Since HEPA-filtered air is returned to the laboratory, these enclosures have the

added benefits of low installation costs, portability and energy savings as outside ducting is not required. Enclosures are available in 2', 3' and 4' widths.

Labconco Corporation
816.333.8811
Kansas City, MO
www.labconco.com



Flowserve

Flowserve Introduces the Logix 3200IQ and 500SI Series High-Performance Digital Positioners

Flowserve Corp., introduces the Logix™ 3200IQ and 500si series high-performance digital positioners.

Offering quick set up and calibration of either diaphragm- or piston-operated valves without the need for additional handheld devices, software or configuration/calibration tools, the Logix 3200IQ and 500si series are used in oil and gas production and refining, chemical processing, pulp and paper production, and other industries employing control valves.

The explosion-proof Logix 3200IQ and the intrinsically safe 500si series use state-of-the-art piezo technology and inner-loop feedback to provide superior performance, control, and reliability with minimal air consumption in compact, lightweight and modular designs.

The 500si series is available in two models–the 510si and the 520si. While the 510si serves the analog (4–20 mA) market, the 520si, like its sister, the 3200IQ, serves the "smart" HART® positioner market. By using the HART communication protocol, the Logix 520si and 3200IQ can provide wide-ranging data to a facility's control system (DCS or PLC) or to its maintenance database software.

"The Flowserve Logix 3200IQ and 500si series HART positioners enable our customers to realize all of the benefits of HART technology," says Wayne Naumann, marketing product manager, Flowserve. "These robust and reliable positioners are easy to configure and calibrate, and offer easily accessible diagnostic information, which makes it possible for our customers to minimize downtime and keep their plants up and running."

The Logix 3200IQ and 500si series offer a feature-rich set of benefits: Commissioning is easily performed by simply setting a few switches and pressing the QUICK-CAL™ button. The Direct User Interface provides local access to positioner control without requiring multi-level menus, a handheld communicator or laptop computer; Green, yellow and red local status LEDs, visible from a distance, indicate the positioner's current status without removing the cover; LEDs provide instant information relating to internal diagnostic codes. These codes indicate positioner status and alarms to operators without the need for a handheld communicator or laptop computer; and a unique Direct User Interface enables the positioner to provide fast and easy configuration. Local configuration switches allow the user to set all basic parameters for positioner operation, such as output characteristic (e.g., equal percent, linear or custom), air action, signal direction, gain, tuning, etc. Calibration typically takes less than one minute.

Other important features of the 3200IQ and 500si series include: A jog calibrate function allows the user to easily and quickly calibrate the positioner on all actuators without physical stroke stops; Adapting the response of the positioner to a particular valve configuration is as simple as pressing a button. A built-in auto-tuning function, when enabled, quickly adjusts the response to match the valve and actuator. If the automatic tuning does not match the needs of the process, it can be modified in seconds by selecting a less aggressive auto-tune (gain) setting from the local user interface. Once set, the tuning is fixed until the next time an auto-tune is performed; With Flowserve SoftTools™ software or a handheld communicator, a custom 21-point characterization curve can be generated that can be used to change the response of the positioner to meet the process requirements; SoftTools allows the user to gather detailed diagnostic information regarding valve performance and positioner condition, in addition to the LED status codes; Two-stage control provides faster response and tighter control; A configuration lockout option in SoftTools permits users to perform automatic calibration procedures without modifying existing configuration and tuning settings; and NAMUR and VDI/VDE mounting interfaces provide direct standardized mounting to various linear or rotary actuators. Mounting kits are also available for non-NAMUR actuators.

Flowserve Flow Control
801.489.2537
Dallas, TX
www.flowserve.com

Arizona Instrument Ash Analysis Made Faster and Easier

Traditional dry ashing test methods require hours in a muffle furnace to oxidize sample material. Now, with the innovative new Computrac MAX 5000 analyzer, manufacturers get reliable results in only a fraction of the time. In addition to shortened throughput time, inaccurate test results due to sample mishandling are significantly reduced by this self-contained analyzer.

The MAX 5000 analyzer tests samples at temperatures as high as 600°C in a compact footprint, reproducing high temperature test results while virtually eliminating the need for bulky, time-consuming furnaces. A linked test option allows operators to measure moisture, solids, and ash in samples ranging in weight from 200 mg to 100 g in one easy procedure. In addition, the analyzer's software includes an optional security feature that complies with FDA data storage requirements, powerful statistical and graphical analysis capabilities, and high capacity test result storage.

"The food industry has struggled for years wlth difficult testing techniques," says Michael Larson, lab manager at Arizona Instrument. "The new MAX 5000 analyzer is versatile enough to not only replace other laboratory ashing equipment; it can also be used in production and quality control areas."

Arizona Instrument
800.290.1414
Tempe, AZ
www.azic.com

New Anti-Splash Floor Troughs from Eagle Foodservice Equipment

Eagle Foodservice Equipment introduces new anti-splash floor troughs, designed for use in a wide range of demanding foodservice operations. Eagle's ingenious anti-splash design (patent pending) incorporates a built-in pitch angle to assure complete drainage, while also preventing waste from splashing back onto the floor.

Eagle anti-splash floor troughs are available with either subway-style stainless steel grating or fiberglass grating. The trough's stainless steel waste cup accommodates pipes up to four inches (102 mm) in diameter, and features a removable perforated stainless steel basket. All models are secured with anchor straps. Choose from many standard-size models to fit 12", 15", 18" and 24" wide trough openings. Custom sizes are also available.

Anti-splash floor troughs from Eagle are ideal for ensuring complete drainage in a variety of applications including drain-off at kettles, indirect waste drainage at walk-in refrigerated boxes, as well as indirect waste drainage for sinks.

Eagle Foodservice Equipment
800.441.8440
Clayton, DE
www.eaglegrp.com

Hannay's SSN700 Ideal for Confined Spaces

The SSN700 series stainless steel hose reel is specifically designed for heavy duty applications, and is compact and mountable in tight spaces. With no paint to chip and no potential for rust and corrosion, these reels are ideal for the food and beverage, dairy, pharmaceutical and cosmetics industries as well as harsh environments. Typical applications include washdown, chemical transfer, potable water, food ingredient transfer and fire protection.

The SSN700 is constructed of fine grade 304 stainless frames, discs and drums. It handles single hose from 1/4" to 1/2" ID and features a heavy duty spring motor with self-contained rewind power.

Hannay Reels Inc.
1.877.GO.REELS
Westerlo, NY
www.hannay.com

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

COMING EVENTS

DECEMBER

- **1–2, Food Plant Sanitation,** GFTC, Guelph, Ontario, Canada. For more information, contact GFTC at 519.821.1246; E-mail: gftc@gftc.ca.
- **2–5, ALEXPO 2004,** Hilton Green Plaza, Alexandria, Egypt. For more information, contact Alex Fair at 011.203.358.0139; E-mail: abi2000@link.net.
- **6–8, Microbiology and Engineering of Sterilization Process Course,** Valley Forge, PA. For more information, contact Ms. Ann Rath at 612.626.1278.

FEBRUARY

- **8–11, Food Pasteurization with Electronic Irradiation,** College Station, TX. For more information, contact Tom A. Vestal at 979.458.3406; E-mail: t-vestal@tamu.edu.
- **10–12, Expo Carnes 2005,** Cintermex, Monterrey, N.L., Mexico. For more information, outside Mexico call +52.81.83.69.66.60.64 y 65; E-mail: lizapex@cintermex.com.mx.
- **15–17, NFPA's 2005 Food Claims and Litigation Conference,** Ojai, CA. For more information, call 202.639.5950; Web site: www.nfpa-food.org/documents/FoodLitRegForm05.pdf.
- **17, Georgia Association for Food Protection Annual Spring Meeting,** University of Georgia, Food Science Bldg., Athens, GA. For more information, contact Mark Norton at 404.656.3621 E-mail: mnorton@agr.state.ga.us.
- **22–24, Kentucky Association of Milk, Food & Environmental Sanitarians Annual Spring Meeting,** Executive Inn West, Louisville, KY. For more information, contact Laura Strevels at 859.363.2022; E-mail: laura.strevels@ky.gov.

MAY

- **12–17, The 30th National Conference on Interstate Milk Shipments,** Hyatt on Capitol Square, Columbus, OH. For more information, contact Leon Townsend at 502.695.0253; E-mail: ltownsend@ncims.org.
- **23–26, AOAC Midwest Section Meeting and Expo,** Kansas City, MO. For more information, contact Ron Jenkins at 816.891.0442; Web site: www.midwestaoac.org.

IAFP UPCOMING MEETINGS

AUGUST 14-17, 2005
Baltimore, Maryland

AUGUST 13-16, 2006
Calgary, Alberta, Canada

JULY 8-11, 2007
Lake Buena Vista, Florida

IT'S A FACT

Publish your upcoming meetings in the Coming Events section of *FPT.*

E-mail Donna Bahun
at dbahun@foodprotection.org
or call 800.369.6337.

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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
Food Protection Trends
International Association for Food Protection
6200 Aurora Ave., Suite 200W
Des Moines, Iowa 50322-2864, USA

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

ADVERTISING INDEX

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a. Total Number of Copies (Net press run)	3,267	3,325
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(2) In-County as Stated on Form 3541	0	0
(3) Other Classes Mailed Through the USPS	63	87
e. Free Distribution Outside the Mail (Carriers or other means)	190	195
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PS Form 3526, October 1999 (Reverse)

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Research Notes

Reviews

Erratum

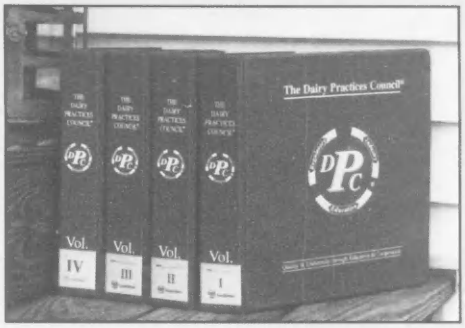
In the article "Rapid, Specific Detection of *Salmonella* Enteritidis in Pooled Eggs by Real-Time PCR," by Soo et al., *Journal of Food Protection* 67(5):864–869, two base pairs were missing in the reverse primer sequence. The corrected table appears below.

TABLE 1. *Primers and fluorogenic probe specific for amplification of the sdfA gene*

Name of probe	Sequence (5′ → 3′)	Denaturation temp (primer/probe mixes)	Location within the sdfA gene
Primer			
Forward	ggcttcggtatctggtggtgta	60°C (60–68)	330–351
Reverse	ggtcattaatatcggctcccctgaata	70°C (60–68)	497–468
Probe			
SEP14	6FAMccactgtcccgttcgttgtggcaTAMRA*	70°C (150–68)	353–377

*6FAM, 6-carboxyfluorescein (the reporter dye); TAMRA, 6-carboxytetramethylrhodamine (the quencher dye).

*Asterisk indicates author for correspondence.



IAFP
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from
The Dairy Practices Council®

This newly expanded Four-volume set consists of 70 guidelines.

1 Planning Dairy Freestall Barns
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3 Selected Personnel in Milk Sanitation
4 Installation, Cleaning, & Sanitizing of Large Parlor Milking Systems
5 Directory of Dairy Farm Building & Milking System Resource People
6 Natural Ventilation for Dairy Tie Stall Barns
7 Sampling Fluid Milk
8 Good Manufacturing Practices for Dairy Processing Plants
9 Fundamentals of Cleaning & Sanitizing Farm Milk Handling Equipment
10 Maintaining & Testing Fluid Milk Shelf-Life
11 Sediment Testing & Producing Clean Milk
12 Tunnel Ventilation for Dairy Tie Stall Barns
13 Environmental Air Control and Quality for Dairy Food Plants
14 Clean Room Technology
15 Milking Center Wastewater
16 Handling Dairy Products from Processing to Consumption
17 Prevention of & Testing for Added Water in Milk
18 Fieldperson's Guide to High Somatic Cell Counts
21 Raw Milk Quality Tests
22 Control of Antibacterial Drugs & Growth Inhibitors in Milk and Milk Products
23 Preventing Rancid Flavors in Milk
24 Troubleshooting High Bacteria Counts of Raw Milk
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27 Dairy Manure Management From Barn to Storage
28 Troubleshooting Residual Films on Dairy Farm Milk Handling Equipment
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30 Potable Water on Dairy Farms
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50 Farm Bulk Milk Collection Procedures
51 Controlling the Accuracy of Electronic Testing Instruments for Milk Components
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54 Selection of Elevated Milking Parlors
54S Construction Materials for Milking Parlors
56 Dairy Product Safety (Pathogenic Bacteria) for Fluid Milk and Frozen Dessert Plants
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80 Food Allergen Awareness In Dairy Plant Operations
83 Bottling Water in Fluid Milk Plants
100 Food Safety in Farmstead Cheesemaking
103 Approving Milk and Milk Product Plants for Extended Runs

IAFP has agreed with The Dairy Practices Council to distribute their guidelines. DPC is a non-profit organization of education, industry and regulatory personnel concerned with milk quality and sanitation throughout the United States. In addition, its membership roster lists individuals and organizations throughout the world.

For the past 34 years, DPC's primary mission has been the development and distribution of educational guidelines directed to proper and improved sanitation practices in the production, processing, and distribution of high quality milk and milk products.

The DPC Guidelines are written by professionals who comprise six permanent task forces. Prior to distribution, every guideline is submitted for approval to the state regulatory agencies in each member state. Should any official have an exception to a section of a proposed guideline, that exception is noted in the final document.

The guidelines are renown for their common sense and useful approach to proper and improved sanitation practices. We think they will be a valuable addition to your professional reference library.

If purchased individually, the entire set would cost $327. We are offering the set, packaged in four looseleaf binders for $245.00.

Information on how to receive new and updated guidelines will be included with your order.

To purchase this important source of information, complete the order form below and mail or fax (515-276-8655) to IAFP.

Please enclose $245 plus $17 shipping and handling for each set of guidelines within the U.S. Outside U.S., shipping will depend on existing rates. Payment in U.S. $ drawn on a U.S. bank or by credit card.

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- ❒ D1050 Food Safety: Dairy Details
- ❒ D1060 Frozen Dairy Products
- ❒ D1070 The Gerber Butterfat Test
- ❒ D1080 High-Temperature, Short-Time Pasteurizer
- ❒ D1090 Managing Milking Quality
- ❒ D1100 Mastitis Prevention and Control
- ❒ D1105 Milk Hauler Training
- ❒ D1110 Milk Plant Sanitation: Chemical Solution
- ❒ D1120 Milk Processing Plant Inspection Procedures
- ❒ D1125 Ohio Bulk Milk Hauling
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- ❒ D1140 Pasteurizer – Operation
- ❒ D1150 Processing Fluid Milk (slides)

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- ❒ E3150 Radon
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- ❒ E3235 Regulatory and Good Manufacturing Practices
- ❒ E3240 Sink a Germ
- ❒ E3245 Wash Your Hands
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- ❒ F2143 GMP Basics: Guidelines for Maintenance Personnel
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- ❒ F2153 Tape 3: Building and Facilities
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- ❒ F2340 Sanitizing for Safety
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- ❒ F2430 Smart Sanitation: Principles & Practices for Effectively Cleaning Your Food Plant
- ❒ F2370 Supermarket Sanitation Program – "Cleaning & Sanitizing"
- ❒ F2380 Supermarket Sanitation Program – "Food Safety"
- ❒ F2390 Take Aim at Sanitation
- ❒ F2391 Understanding Foodborne Pathogens
- ❒ F2410 Wide World of Food-Service Brushes
- ❒ F2420 Your Health in Our Hands – Our Health in Yours

OTHER

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- ❒ M4020 Eating Defensively: Food Safety Advice for Persons with AIDS
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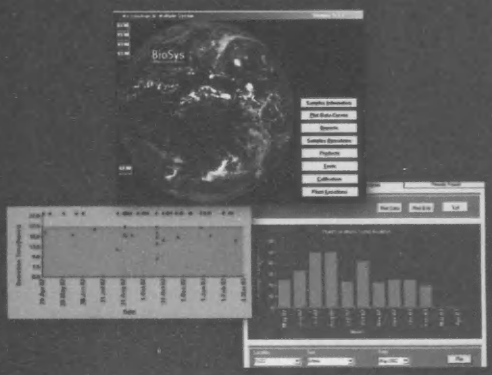

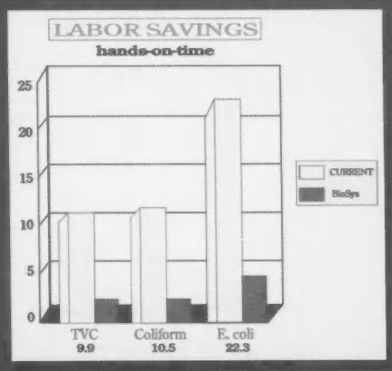

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