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DAIRY FOOD AND ENVIRONMENTAL

# Sanitation

A PUBLICATION OF THE INTERNATIONAL ASSOCIATION FOR FOOD PROTECTION, INC.

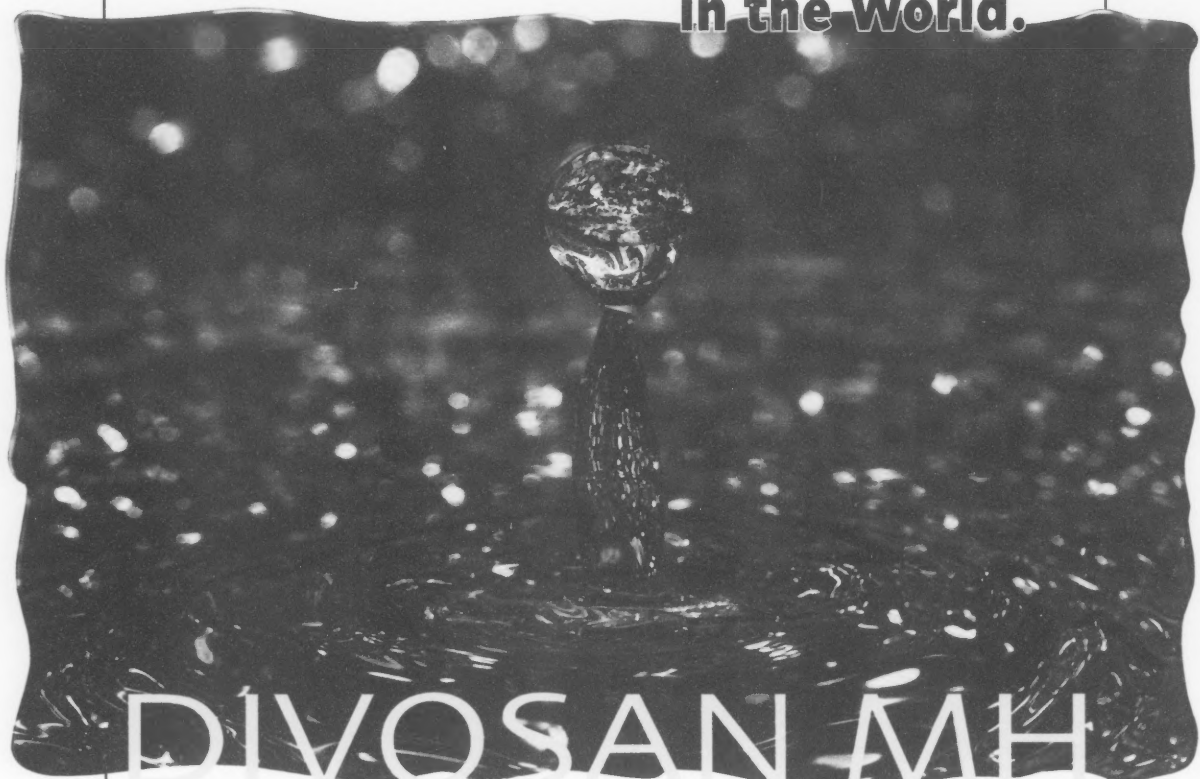
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DAIRY, FOOD AND ENVIRONMENTAL

# Sanitation



International Association for  
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# My Perspective



By JENNY SCOTT  
President

## **“Affiliates help us fulfill our mission”**

As we all know, the mission of the International Association for Food Protection is to provide food safety professionals worldwide with a forum to exchange information on protecting the food supply. In my April column I mentioned a number of ways IAFP fulfills its mission. In this column I would like to reflect on the importance of our Affiliate organizations in extending our efforts to a broader audience.

According to the IAFP Constitution and Bylaws, IAFP Members in a geographical area and organizations whose objectives are consistent with those of IAFP may apply for a charter as an Affiliate Association. IAFP now has 37 Affiliates: 31 in the United States, four in Canada, and one each in Korea and Mexico. The Affiliates and their officers are listed on page 498 in this journal. All the people listed have committed themselves to the same objective as IAFP – to promote a safe food supply. And they have volunteered their time to organize programs at the local level to help disseminate food safety and other information to help their members stay informed of current developments and better do their jobs. Thus, our Affiliates can be viewed as a grassroots food safety and environmental health effort, bringing education to the trenches where our first line of defense is.

I had the good fortune to visit nine of our Affiliates since I have been on the IAFP Board. I've have been able to see first hand the quality of the programs

they provide. The topics have included HACCP, milk safety and quality, environmental regulations, bioterrorism, retail food safety, foodborne pathogens, irradiation, temporary food units, sanitation inspections, drug residues, microbiological testing, epidemiology of foodborne illness, and the National Food Safety System. If it sounds a bit like an IAFP Annual Meeting, it's really not surprising. We share concerns for similar issues. In fact, some Affiliates hold meetings that resemble the IAFP Annual Meeting on a smaller scale – two or three days at a hotel or conference center, concurrent sessions, workshops, business meeting, exhibits, golf tournament, and an awards banquet. Others simply have one or two speakers address a topic of concern in an organization's conference room. Meetings may have 30 or 300 attendees. Some Affiliates meet once a year, others two, three or even more times. Regardless of the format or the size of the meeting, they all serve a purpose: a forum to exchange information on protecting the food supply.

Who belongs to an Affiliate? Obviously some of the same people who belong to IAFP: regulatory personnel, academics interested in food safety and environmental health, students, food industry personnel, suppliers of products and services. In the Affiliates there are often more members from local health departments; state and local inspectors of retail establish-

ments, dairy operations and farms; food safety managers from local retail operations, etc. Many Affiliate members rarely have the opportunity to attend national meetings because of budget restrictions of their organizations or time commitments of their jobs. Thus the Affiliate serves as a vital source of information and a means for discussion with other professionals on topics of mutual interest.

IAFP recognizes the value of having these groups associated with our organization, and we hope the Affiliates find value in being associated with IAFP. We ask (in fact, the IAFP Bylaws require) that all Affiliate Presidents and Delegates to the IAFP Affiliate Council be Members of IAFP. This insures that Affiliate officers are kept informed of IAFP activities and can keep their members apprised. Each

Affiliate is allowed one representative (their Delegate) on the Affiliate Council. The Affiliate Council meets at the Annual Meeting and represents the interests of the Affiliates. IAFP has also implemented programs of benefit to the Affiliates. Each Affiliate Officer and Delegate receives a quarterly newsletter containing information about Affiliate activities, as well as other information of interest to Affiliate members. We announce Affiliate meetings in *Dairy, Food and Environmental Sanitation*, and we provide a listing of Affiliates and officers in the journal so that IAFP Members in your area know whom to contact. We send sample journals, audiovisual library listings and publications listings for distribution at Affiliate meetings. In addition, IAFP Board members

are available to speak at Affiliate meetings. (IAFP pays for travel to the meeting; the Affiliate pays local expenses.) There's only one small catch: because we would love to have more of the Affiliate members join IAFP, we ask that the Board member be given a few minutes to speak about the Association and the benefits of belonging to IAFP.

All our Board members who have had the opportunity to speak at Affiliate meetings have been very positive about the experience. It has been great to meet IAFP Members on their home turf, to meet potential new members, and to hear different perspectives on protecting the food supply. After attending these Affiliate meetings, I'm even more convinced: The Affiliates truly do help IAFP fulfill its mission.

## *Chanhassen Dinner Theater*

**Tuesday, August 7, 2001**

5:30 p.m. – 11:00 p.m.

Food and entertainment — what a perfect combination! The people at Chanhassen Dinner Theater know this and have been working hard since 1968 to perfect this concept. Quoted as “the Cadillac of Dinner Theaters,” it is the nation’s largest professional dinner theater complex.

Tickets are limited, so order yours today (see page 541).

# COMMENTARY

## FROM THE EXECUTIVE DIRECTOR



By DAVID W. THARP, CAE  
Executive Director

**“Feel free to contact me at anytime if you have questions about Association activities or operations”**

This month I thought it would be of interest to cover some recent happenings in the Association. These include a couple of items from the April Board meeting, what is going on at the IAFP office, and a meeting in São Paulo, Brazil. First, let's take a look at the Board meeting.

The April Executive Board meeting took place at the Association office in Des Moines. For the last four or five years, Board Members have come to Des Moines two times per year for spring and fall meetings. This semi-annual visit allows interaction with staff and has led to a real bonding and a level of trust not experienced prior to holding Board meetings at the IAFP offices. The time together allows Board Members to understand the type of tasks and the volume of work that the staff has to contend with on a daily basis. Our staff gains by talking with Board Members and learning about their work and how it helps to “advance food safety worldwide.” A mutual respect for each other has blossomed and grown over the years. It has been wonderful to watch and experience these growing relationships.

Two important agenda items for the spring Board meeting included budget approval for the next fiscal year and planning for the Association's future. Of course the two go hand-in-hand. If the planning session creates a new project for the budget year, the budget must be able to accommodate the project. Goals

were set for the year ending August 31, 2002. (We will have to review the planning goals in a future issue.) The budget was approved with a 9% increase in revenue over the current year's budget – expenses were projected to increase by 9% also. The projected growth in revenue is mostly through our communications and Annual Meeting revenues. You will be glad to know the budget was approved without a dues increase for the year beginning September 1, 2001. Consider this, for \$90 dues you receive Membership in the world's leading food safety organization AND 12 issues of *Dairy, Food and Environmental Sanitation*. We will continue to offer the early payment option that allows a \$10 discount if you pay within 30 days of your first renewal invoice. That means that your Membership is just more than \$6.50 per month or 22 cents per day!

Here we are just short of three months until IAFP 2001 – the Association's 88th Annual Meeting. Activity has picked up steadily since the first of the year. April and May were busy with preparing the promotional brochure, administering the awards program, corresponding with more than 300 presenters and working with our exhibitors. June sees the bulk of our registrations come in and continued coordination with the Minnesota Local Arrangements Committee. Final preparations for the Program and Abstract Book along with the Awards Banquet Book and Opening Session Book must also be completed. In July, every

detail is reviewed to be sure nothing is overlooked. Even the signage must be prepared, proofed and sent to Minneapolis. One of the last items on our timeline is to ship all program materials, office supplies and registration records to the Annual Meeting site. Then the real work begins!

Annual Meeting is an exciting time for our staff because we are able to meet Members we have talked to on the phone; we are able to see Members we've met over the years and the staff has the opportunity to put our expertise to work in providing an environment favorable for our attendees to learn from other food safety professionals. Yes, it is long hours and a lot of hard work, but it is all worth it when we receive thanks and complements from you, the IAFP Members! That is truly what keeps us enthused and keeps us going.

The last topic for this month is a meeting that took place early in May in Brazil. The Pan American Health Organization (PAHO) and the World Health Organization hosted a meeting on health and agriculture (RIMS XII) in São Paulo for ministry level personnel from North America, South America and Central America. The objectives for this meeting included discussing matters of mutual interest for health and agriculture and analyzing compliance with the strategic and programmatic orientations of PAHO in veterinary public health and the plans of action of its specialized centers: the Pan American Foot-and-Mouth Disease Center (PANAFTOSA) and the Pan American Institute for Food Protection and Zoonosis (INPAZ), for the biennium 2002-2003. The meeting also addressed current issues in animal health and food

safety and their importance to public health and socioeconomic development.

IAFP was invited to send a representative to the meeting to interact with the meeting attendees. Our Executive Board Members were unable to attend so an invitation was extended to Dr. Fritz Käferstein to represent IAFP. He graciously accepted our request and will report on his attendance in a future issue of *DFES*. Be sure to watch for this special report.

I hope this month's column helps to keep you informed about the operations of the International Association for Food Protection. Feel free to contact me at anytime if you have questions about Association activities or operations. We are always happy to take your calls or answer your E-mail correspondence. For now, take care and we hope to see you in Minneapolis this August.



## Minnesota Twins Baseball Game

**Go  
Twins!**

**Tuesday, August 7, 2001**

6:00 p.m. - 10:00 p.m.

**Minnesota Twins  
vs.  
Cleveland Indians**

(Order your tickets on page 541).



**Join your friends and colleagues  
for a night at the ballpark.**

# A Comparison of Traditional and Recently Developed Methods for Monitoring Surface Hygiene within the Food Industry: A Laboratory Study

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Colchester Avenue, Cardiff, CF23 9XR, UK

## SUMMARY

Several newly developed instrument-free hygiene monitoring systems based on protein detection were assessed for their ability to evaluate surface cleanliness. Their performance under controlled laboratory conditions was compared to that of both adenosine triphosphate (ATP) bioluminescence and traditional agar-based microbiological methods. Stainless steel surfaces were inoculated with known levels of *Escherichia coli* or with food debris of the type likely to be found in different food preparation environments. The hygiene monitoring methods were then used to sample the surfaces while they were still wet or after they had been air dried for 1 hour. The ability of the various methods to detect bioburden depended on the level of contamination and the combination of microbial count and food debris present. The most sensitive protein detection tests were superior or comparable to ATP bioluminescence in detecting bioburden high in protein. In the presence of bioburden with a low protein content but a high microbial count, none of the protein detection tests indicated that surfaces were unsuitable for food production, although agar-based microbiological methods indicated that large numbers of bacteria were present. The implications of these findings will be discussed in relation to hygiene monitoring in the food industry.

A peer-reviewed article.

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## INTRODUCTION

In any food processing environment, residual food debris on production surfaces can both encourage and facilitate the survival and growth of microorganisms, by providing protection from the direct action of sanitizers and disinfectants and/or by providing a nutritious medium for growth (12). Within the food industry, cleaning schedules are designed to reduce both food debris and microorganisms to a level that poses minimal risk to the safety or quality of the product (16). An inadequately cleaned surface can, if in contact with food, lead to cross contamination and contribute to a product's microbial load. This may result in a decreased shelf-life, but perhaps of more concern is the possible presence of pathogens, particularly those with a low minimum infective dose.

Cross contamination has been identified as an important contributory factor in 39% of general food-borne disease outbreaks recorded in the UK (10). Consequently, Hazard Analysis Critical Control Point (HACCP)-based food safety management systems together with supporting prerequisite programs (PRPs) recommend that adequate cleaning and sanitation protocols must be in place to prevent contamination of the product during processing (8). Studies have shown, however, that the effectiveness of cleaning within the food industry is variable, indicating a need for validation of cleaning schedules (9). It has been suggested that there is a clear legal obligation for food premises to be kept clean (8) and that every manufacturer has a responsibility to identify, document, establish and monitor an appropriate cleaning program for all food contact surfaces (2). However, because no ideal method exists for determining the cleanliness of surfaces, there is no standard protocol for surface hygiene monitoring (13).

Traditionally, microbiological methods such as hygiene swabbing

or agar contact plates have been used to detect bacteria on food contact surfaces (3, 15, 26). These hygiene monitoring methods, which are typically media and cultivation-based, can take up to 48 hours to complete. The results are therefore retrospective and as such have limited value in preventative, proactive food management systems such as HACCP, which require that hygiene monitoring provide results rapidly enough for remedial action to be implemented (13, 14).

The presence of microorganisms on food contact surfaces is important, but the hygienic status of the surface also depends on the presence or absence of product residues (19). If a surface is unclean because of food debris, then this can soon become support for microbial growth and present a contamination risk (1). 'Modernists' argue, therefore, that for initial hygiene monitoring it is important to consider total organic soil, especially if results can be obtained rapidly (13).

Because adenosine triphosphate (ATP) is widely found in organic debris and microorganisms, ATP bioluminescence measurement provides, in most circumstances, a real-time estimate of total surface contamination. Consequently, this method provides a measure of overall cleaning efficacy, and the ability to provide this information within minutes has prompted some authors to recommend ATP testing for use in HACCP plans (5, 6, 14, 21).

Although ATP bioluminescence has proved to be particularly useful in large food manufacturing plants where regular and frequent monitoring can provide management with data on trends in the levels of hygiene (23), few foodservice establishments can support their own hygiene officers (20). Additionally, with the price of a single luminometer typically being as much as \$3000 (£2000), for many small businesses a major disadvantage associated with ATP bioluminescence measurement is the normally high cost of initial pur-

chase of equipment (13). The result is an increased interest in the use and development of rapid, low-cost and/or instrument-free hygiene monitoring devices, including those based on protein detection. Low cost instrumentation, or tests requiring no equipment, allows hygiene monitoring to be carried out without a burdensome initial expenditure and, as with ATP bioluminescence, by staff with little technical training.

The increasing number of rapid tests being made available to the food industry has increased the importance of the standardization, validation, and international acceptance of these new methods (4). Not only should their design and application prove advantageous to users, but they must also be as accurate and reliable for hygiene monitoring as traditionally used and accepted methods are (19).

The aim of the work presented here was to determine the limits of detection of several rapid, low-cost, instrument-free hygiene monitoring devices when these are used to sample stainless steel surfaces contaminated with known levels of microorganisms and various types of organic soil. These methods were compared to ATP bioluminescence methods and to traditional microbiological techniques. This paper does not set out to recommend one particular method, instrument, or test kit for monitoring surface cleanliness; that would be dependent upon the user's priorities and needs (13). The purpose is to compare a range of methods under controlled laboratory conditions.

## MATERIALS AND METHODS

### Preparation of food samples

Bovine serum albumen (BSA, Sigma-Aldrich, Dorset, UK) and the liquid food samples used in this study were serially diluted using sterile deionized (ATP-and protein-free) water. 10g of each solid food sample was placed in a Stomacher bag (Fisher Scientific, Loughborough, UK) with 90 ml sterile deion-

ized water and homogenized at medium speed in a Stomacher 400 laboratory blender (Seward, London, UK) for 30 s. Each sample suspension was then serially diluted again using sterile deionized water.

#### Preparation of bacterial culture

A loopful of *Escherichia coli* (environmental isolate) was aseptically transferred into 100 ml of Nutrient Broth No. 2 (Oxoid) in a 250 ml conical flask and incubated at 37°C for 18 h in an orbital shaking incubator (Model 4518, Forma Scientific Inc, Ohio, USA) at 100 rpm. After incubation, a 5 ml portion of the culture was centrifuged at 3000 × g for 30 min at room temperature. The resulting pellet was then re-suspended in and serially diluted in 5 ml 1/4-strength (ATP- and protein-free) Ringer solution (Oxoid). This was to ensure that the hygiene monitoring tests were detecting the bacteria and not the growth medium.

#### Microbial and biochemical analysis of food samples

One ml of each dilution was pipetted into a petri dish and approximately 15 ml of molten (45°C) Plate Count Agar (PCA, Oxoid, Basingstoke, UK) was added. The contents of the plate were then mixed and the agar allowed to set before being incubated at 30°C for 24 to 48 h. Plates containing at least 30 but no more than 300 colonies at two consecutive dilutions were used for calculating the number of colony forming units (CFU) per gram or ml of test sample.

The soluble protein content of each of the food types was determined by use of either the Biuret or Lowry assay procedure (11).

#### Preparation and inoculation of surface

A food-grade stainless steel table marked with 10 cm × 10 cm squares was used for the majority of this investigation. Additional studies were carried out with sterile, food-grade stainless steel coupons (5 cm × 5 cm).

Prior to inoculation, the table was disinfected for 30 min with 1% Virkon (Antec International, Suffolk, UK) before being rinsed with boiling water. The surface was then cleaned thoroughly using detergent and boiling water and rinsed three times, also with boiling water, to remove all traces of detergent before finally being left to air dry at room temperature. This protocol validated in-house consistently gives ATP bioluminescence readings of 0 Relative Light Units (RLU) or <100 RLU (depending on the system used), microbiological results of <1 CFU/100 cm<sup>2</sup>, and negative results with protein detection techniques.

Once the surface was completely dry, 0.1 ml of each sample dilution was inoculated onto five of the 100 cm<sup>2</sup> stainless steel areas and spread evenly over the surface. The surface was then sampled immediately after inoculation, while it was still wet, or once it had been allowed to air-dry for 1 h, after which time no visible liquid remained on the surface. Control assays were performed by inoculating the surface with 0.1 ml of sterile, ATP- and protein-free deionized water.

Each experiment was carried out using five replicates and repeated to validate the end points.

#### Microbiological sampling of a stainless steel surface

Sterile dacron swabs were moistened in sterile 1/4-strength Ringer solution (Oxoid) immediately before use, and a previously described standard surface swabbing protocol (6) was used to sample the surface. The swabs were then either streaked directly onto the surface of pre-poured PCA plates (spread plates) or snapped off into 10 ml 1/4 strength Ringer solution and vortexed for 10 s to release the bacteria from the bud before 1 ml PCA pour plates were prepared. All plates were incubated at 30°C for 24 h.

PCA dipslides (PC2, Dimanco Ltd, Henlow, UK) were also used to sample a stainless steel surface. However, rather than using the stainless steel table, the dipslides were used to sample sterile stainless steel

coupons (5 cm × 5 cm), which had been autoclaved (121°C for 15 min) before being inoculated with 25 µl of dilution. Each side of a dipslide measures approximately 2 1/2 × 5 cm and both sides were pressed firmly onto the coupon so as to sample the entire 25 cm<sup>2</sup> surface area. The dipslides were then incubated at 30°C for 24 to 48 h.

#### ATP measurement

Two single-shot ATP bioluminescence systems were used during this study – the Clean-Trace™ Rapid Cleanliness Test (UXL 100, Biotrace, Bridgend, UK) and the Charm PocketSwab Plus system (Charm Sciences Inc., Malden, MA, USA). In both cases the 100 cm<sup>2</sup> surface area was swabbed in accordance with the manufacturer's instructions. Readings were taken using the Biotrace Uni-Lite® and the Charm Firefly® luminometer respectively. The latter is a small, specifically designed, prototype low cost instrument for detecting ATP within food handling environments.

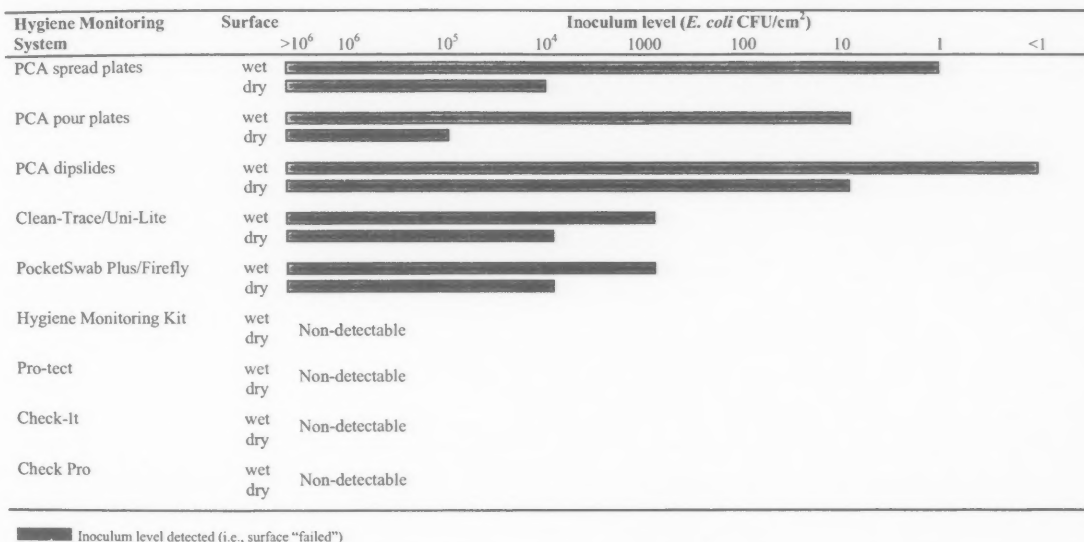
#### Protein detection

Four protein detection kits were evaluated – the Swab & Check Professional Hygiene Monitoring Kit (Ruskinn Data Systems, Leeds, UK), Check Pro (Diversey Lever Ltd., Northampton, UK), Check-It and Pro-Test (Biotrace). The latter device is also capable of detecting reducing sugars and other reducing agents. In all cases the surface was sampled in accordance with the manufacturer's instructions.

#### Interpretation of results

The cleaning protocol used during this investigation ensured that, prior to inoculation, all traces of residual organic debris were removed from the test surface. After inoculation; if residual organic debris was detected on a surface, then that surface would be presumed dirty. This was the case if average ATP readings were >100 RLU (Clean-Trace/Uni-Lite) or >0 RLU (Pocket-Swab Plus/Firefly), or if the color of the protein test differed from that

**Figure 1.** Detection of **bacteria** from wet and dry stainless steel surfaces by use of different hygiene monitoring systems



indicated as clean by the manufacturer. The presence of microbial contaminants on a surface was presumed if the average number of microorganisms recovered from the surface was >1 CFU/100 cm<sup>2</sup>.

## RESULTS

The limits of detection of different hygiene monitoring systems for various food residues under controlled laboratory conditions are presented in Fig. 1-6. The bars indicate those levels of contamination that were detected by the various methods.

### Detection of bacteria on stainless steel surfaces

*Escherichia coli* was of particular interest because of its potential pathogenicity and its wide use as an indicator organism (8). However, the results illustrated in Figure 1 are comparable for a range of organisms of importance to the food industry (data not shown).

Dipslides were the most sensitive means to indicate the presence of bacterial contaminants, detecting an inoculum level of < 1 and 10 *E. coli* colonies / cm<sup>2</sup>, on a wet and dry surface respectively. When used

to sample a wet surface, both ATP bioluminescence systems were less sensitive than all three agar-based microbiological methods. However, when a dry surface was sampled, although still less sensitive than the dipslides, ATP bioluminescence was as sensitive as the spread plate method and more sensitive than use of pour plates to detect bacterial contamination. None of the four protein detection systems detected the presence of even very high levels of bacteria (10<sup>6</sup> CFU/cm<sup>2</sup>).

### Detection of bovine serum albumen (BSA) on stainless steel surfaces

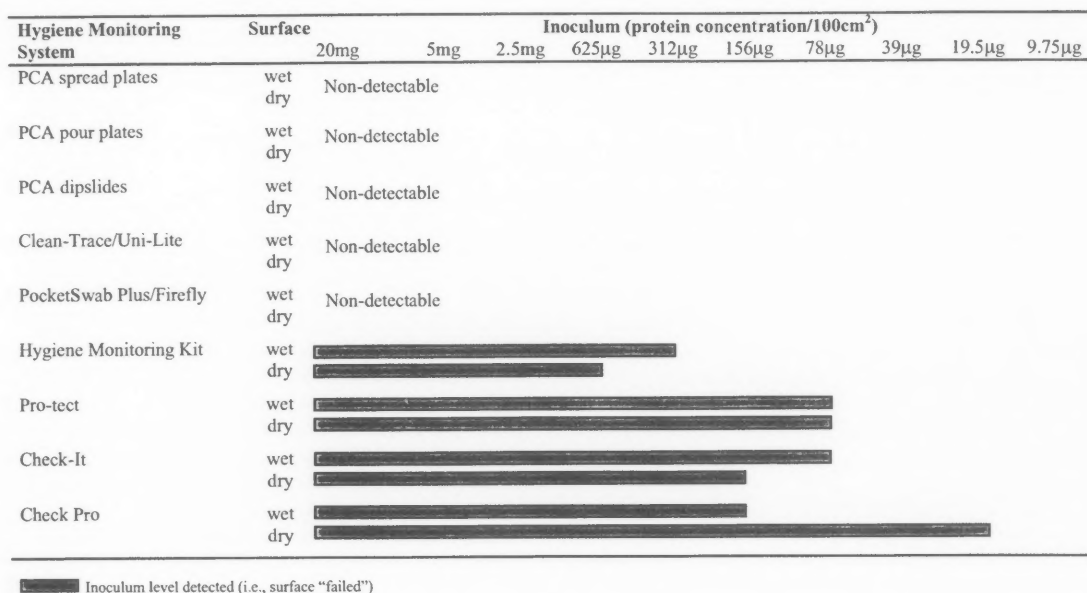
Commercial bovine serum albumen (BSA) is high in protein (20g/dl), does not contain actively metabolizing cells and has a low bacterial count. It was not detectable on surfaces with use of ATP bioluminescence methods or the traditional microbiological methods (Fig. 2). However, all four protein detection systems indicated that the test surfaces were dirty. When a wet or dry surface was sampled, the Hygiene Monitoring Kit was the least sensitive of the four protein detection systems in

detecting residual protein. The other three tests were, within the limits of the experimental protocol, all comparable and, when used to sample a wet surface, were capable of detecting between 78 and 156 µg protein/100 cm<sup>2</sup>. When a dry surface was sampled, the sensitivity of Check-It and Pro-tect were again comparable, but Check Pro was capable of detecting just 19.5 µg protein/100 cm<sup>2</sup>.

### Detection of residual food debris with a high protein content (>20 mg/ml) and a relatively low microbial count (< 300 CFU/ml) (e.g., milk)

Neither the spread nor the pour plates indicated the presence of bacteria and as a result both passed as "clean" all the surfaces tested (Fig. 3). The dipslides, however, did detect bacteria, but only on those coupons that had been inoculated with undiluted milk; at this concentration these surfaces were also visually dirty. Both ATP bioluminescence systems were able to detect milk that had been diluted 100-fold, but only from a wet surface. When used to sample a dry surface, ATP bioluminescence did not appear as sensitive in detecting this type of organic debris as two of

**Figure 2.** Detection of bovine serum albumen (BSA) from wet and dry stainless steel surfaces by use of different hygiene monitoring systems



the protein detection systems (Check Pro, Check-It). All four protein detection tests indicated that both the wet and dry surfaces were dirty, but their sensitivities varied. As with BSA, when a wet surface was sampled, the Hygiene Monitoring Kit was the least sensitive system, while the other three tests were, within the limits of the test protocol, comparable, detecting the presence of milk that had been diluted 50-fold. When a dry surface was sampled, the sensitivity of the Pro-TECT was reduced while that of Check Pro increased, the latter being able to detect a 100-fold dilution of milk that had been allowed to dry on to the surface.

**Detection of residual food debris with a relatively high soluble protein content (>1mg/g) and a high microbial count (>10<sup>7</sup> CFU/g) (e.g., raw poultry)**

Traditional microbiological methods were more sensitive than the protein tests when used to sample a wet surface, being capable of detecting an inoculum that had been diluted 1000-fold. When a dry

surface was sampled, however, the limits of detection of these tests were markedly reduced (Fig. 4). When a wet surface was sampled, ATP bioluminescence was less sensitive than the microbiological methods. However, unlike the agar-based techniques, when used to detect the presence of this type of organic debris from a dry surface, its performance did not appear to be adversely affected. The ability of the protein detection systems to detect these residues varied by type but overall was greater than that of microbiological testing from dry surfaces and less when wet surfaces were tested. When a wet surface was checked, Check-It and Pro-TECT were the most sensitive of the protein tests, detecting the presence of homogenized raw chicken that had been diluted 100-fold.

**Detection of residual food debris with a low soluble protein content (<10 µg/g) and a relatively high microbial count (>10<sup>4</sup> CFU/g) (e.g., raw vegetables)**

When used to sample a wet surface, the dipslides and spread


plates were capable of detecting the presence of bacteria on those surfaces inoculated with homogenized carrot that had been diluted 1000-fold (Fig. 5). Although the sensitivity of these microbiological methods decreased markedly when they were used to sample a dry surface, both ATP bioluminescence systems detected the presence of organic debris on all the surfaces tested, wet or dry. Despite the microbiological methods indicating the presence of large numbers of bacteria, none of the four protein detection tests suggested that any of the surfaces sampled would be unacceptable for food production.

**Detection of residual food debris with a low soluble protein content (<10 µg/g) and a low microbial count (<10 CFU/g)**

When boiled rice was homogenized and inoculated onto the surface (results not presented), none of the different hygiene monitoring systems indicated that any of the wet surfaces sampled were dirty. Check Pro, however, did detect con-

**Figure 3.** Detection of residual food debris with a **high protein** content and a **relatively low microbial** count (e.g., milk) from wet and dry stainless steel surfaces by use of different hygiene monitoring systems

Hygiene Monitoring System	Surface	Inoculum level (dilution factor)				
		NEAT	1:10	1:50	1:100	1:500
PCA spread plates	wet	Non-detectable				
	dry	Non-detectable				
PCA pour plates	wet	Non-detectable				
	dry	Non-detectable				
PCA dipslides	wet	██████████				
	dry	██████████				
Clean-Trace/Uni-Lite	wet	██				
	dry	██				
PocketSwab Plus/Firefly	wet	██				
	dry	██				
Hygiene Monitoring Kit	wet	██				
	dry	██				
Pro-tect	wet	██				
	dry	██				
Check-It	wet	██				
	dry	██				
Check Pro	wet	██				
	dry	██				

 Inoculum level detected (i.e., surface "failed")

tamination on those surfaces that had been inoculated with the initial 10-fold dilution before being allowed to dry.

However, if the residual food debris also had a high ATP content, as was the case with raw washed tomatoes (Fig. 6), then the ATP bioluminescence technique was capable of detecting a 10,000-fold and a 1,000-fold dilution of this food type from a wet and dry surface, respectively. In this case, Check Pro and Pro-tect also detected the presence of homogenized raw tomatoes on those dry surfaces that had been inoculated with a 50-fold and a 10-fold dilution, respectively.

## DISCUSSION

Previous investigations have compared traditional swabbing with both ATP bioluminescence and protein detection methods (3, 6, 17, 18, 22, 25, 26). Most of these studies, however, were performed in the field, and it has been acknowledged that possible variation

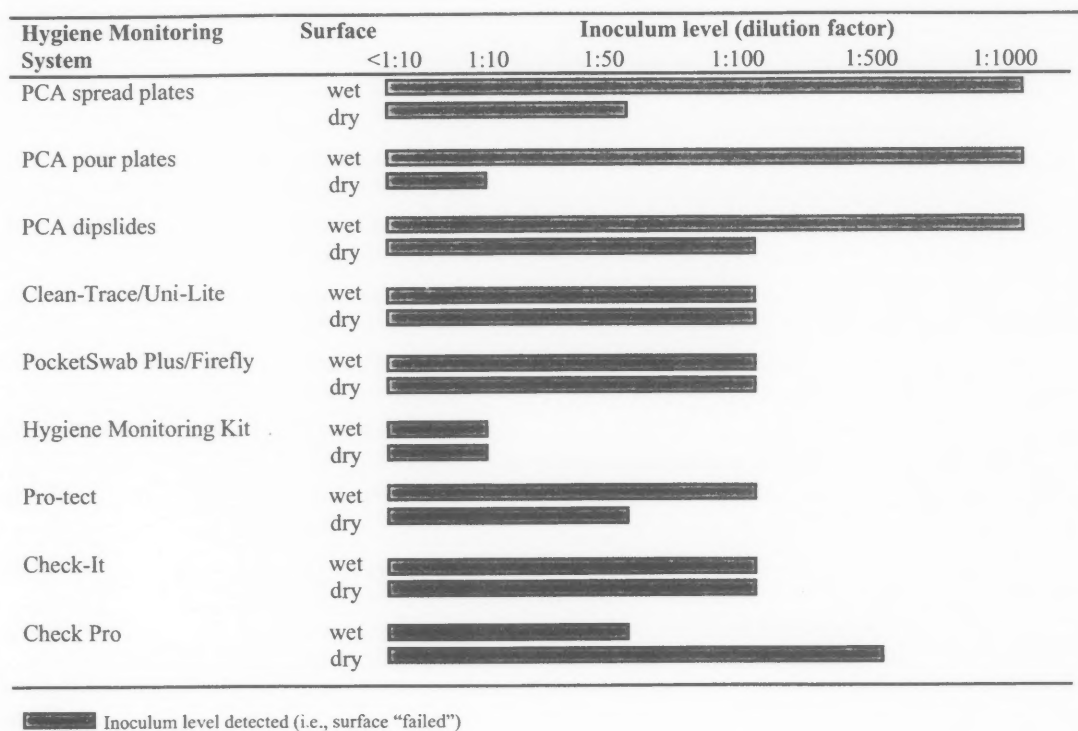
in the level of contamination present *in situ* could have contributed to differences observed in test methods (26). There are, therefore, advantages in conducting some comparison studies under controlled conditions. Not only can the surface be thoroughly cleaned before each experiment, ensuring that all traces of residual organic debris are effectively removed, but known types and levels of food residues can then be inoculated onto the surface. Consequently, in the presence of varying levels and combinations of microbial and food debris, the relative sensitivities of the different hygiene monitoring methods can be determined more accurately than they could in the field.

The traditional method of evaluating the cleanliness of food contact surfaces has been enumeration of microorganisms (3, 15, 26). Under most circumstances, bacteria are rarely present in the absence of any food debris or in the form of a pure culture; consequently, the

results presented in Figure 1 are derived from a situation unlikely to arise *in situ*. Nevertheless, these results do corroborate the findings of other studies and suggest that traditional agar-based microbiological methods are capable of detecting, on a wet surface, the presence of very low levels of bacteria (6). However, as with previous studies, the results also illustrate the comparatively poor performance of these methods in detecting bacterial contamination on a dry surface (6).

It has been suggested that this reduced sensitivity is due to a loss of microbial viability during drying (6). Dipslides are similar to contact plates and are pressed directly onto the surface to be sampled; any microorganisms present will contaminate the agar and subsequently grow. Figures 1, 4 and 5 illustrate that dipslides were also less effective in detecting the presence of bacteria from a dry surface than from a wet surface, although this reduction in sensitivity was less

**Figure 4.** Detection of residual food debris with a **relatively high protein** content and a **high microbial** count (e.g., raw chicken) from wet and dry stainless steel surfaces by use of different hygiene monitoring systems



marked than for either the spread or pour plate methods. This strongly suggests that in these cases, bacteria initially present within the product residue on the surface did survive drying and that loss of microbial viability was not the only contributing factor in reducing the sensitivity of the hygiene swabs.

The increased adhesion of bacteria on dry surfaces has also been suggested as an explanation for the differences in results obtained using hygiene swabs (6). This raises questions regarding the numerous swab wetting agents available and their effectiveness in picking up bacteria from the surface. However, work currently in progress, which is attempting to identify the main cause of the reduction in swab sensitivity, has indicated that the percentage of bacteria removed from a dry surface is not significantly different from that removed

from a wet surface. Nevertheless, in the presence of organic debris, microbial detection was reduced for all microbiological methods, which could have been caused by stronger surface attachment by the bacteria as the result of their adhesion to food debris adsorbed to the surface.

The effective removal of organisms from the swab has, however, been identified as an important contributory factor with regard to swab sensitivity. At present there is no universally recommended protocol for releasing the bacteria from the bud, and as with previous studies (17), the swabs during this investigation were vortexed in 10 ml of diluent for 10 s. Results obtained in-house (data not presented) suggest that, if swabs are sampled immediately after inoculation, vortex time has no significant effect upon the number of bacteria released from the swab.

A survey of 500 food manufacturing businesses in the UK showed that 48% of respondents used hygiene swabs to monitor hygiene (6). If agar-based microbiological methods are the preferred means to determine whether a surface should "pass" or "fail", then results of this investigation suggest that, in the presence of residual food debris, dipslides rather than swabs should be the method of choice for detecting the presence of microorganisms (Fig. 3, 4, and 5). Although these findings are supported by other studies (28), it is acknowledged that data provided by this method of hygiene monitoring is semi-quantitative and as a result gives only an indication of bacterial numbers. If actual bacterial counts are required, then traditional plate count methods should be employed.

When dipslides are used, the lack of pressure involved during sample collection and processing

**Figure 5.** Detection of residual food debris with a **low protein** content and a **relatively high microbial count** (e.g., raw carrot) from wet and dry stainless steel surfaces by use of different hygiene monitoring systems

Hygiene Monitoring System	Surface	Inoculum level (dilution factor)					
		<1:10	1:10	1:50	1:100	1:500	1:1000
PCA spread plates	wet	[Inoculum level detected]					
	dry	Non-detectable					
PCA pour plates	wet	[Inoculum level detected]		Non-detectable			
	dry	Non-detectable					
PCA dipslides	wet	[Inoculum level detected]					
	dry	[Inoculum level detected]				Non-detectable	
Clean-Trace/Uni-Lite	wet	[Inoculum level detected]					
	dry	[Inoculum level detected]					
PocketSwab Plus/Firefly	wet	[Inoculum level detected]					
	dry	[Inoculum level detected]					
Hygiene Monitoring Kit	wet	Non-detectable					
	dry	Non-detectable					
Pro-tect	wet	Non-detectable					
	dry	Non-detectable					
Check-It	wet	Non-detectable					
	dry	Non-detectable					
Check Pro	wet	Non-detectable					
	dry	Non-detectable					

[Inoculum level detected (i.e., surface "failed")]

means that clumps of food residues are not broken up and organisms present within the debris are not released (24). This could explain the variation in the minimum detection limits attained by the dipslides during this investigation (Fig. 1, 3, 4, and 5), which may have been due to differences in the aggregation of microorganisms within the different types of food debris. It is also important to consider that bacterial growth is encouraged by the presence of food residues not only on production surfaces themselves, but also within crevices, joints or unions. Hygiene swabs can be used to sample difficult-to-clean, uneven or irregular surfaces; dipslides however, can be used to sample flat surfaces only.

The disadvantage of all agar-based hygiene monitoring techniques is the time required for results to be obtained. HACCP requires that monitoring should

provide results in time for remedial action to be implemented (13, 14). Adenosine triphosphate (ATP) bioluminescence provides results in real-time. Additionally, all actively metabolizing cells contain ATP and consequently both microbial cells and cells from most types of residual food debris will contribute to the total ATP detected by the ATP bioluminescence technique (15, 19). In many cases bacteria are transferred to a surface with food and as a result several studies have shown a good correlation between the number of surfaces failed by plate count methods and those failed by ATP bioluminescence (3, 15, 18, 25). Other studies, however, have shown a poor correlation (22).

The inoculation of known levels of food debris in combination with different numbers of microorganisms onto surfaces during this laboratory-based study helps explain why such a disagreement exists. Figure 1 shows that traditional

microbiological methods are capable of detecting far fewer bacterial contaminants present on a wet surface than ATP bioluminescence. Therefore, should moderate numbers of bacteria be present in the absence of food debris, then surfaces may fail when the microbiological methods are used but pass when ATP bioluminescence is used. This situation could arise, for example, if the terminal disinfection stage of a cleaning protocol is ineffective or if cleaned surfaces subsequently become re-contaminated with microorganisms. Conversely, on those food contact surfaces where microorganisms are absent (Fig. 6) or are present only at levels proportionally much lower than the level of the food debris (Fig. 3), surfaces acceptable for food production by means of the microbiological methods can be deemed unclean by the ATP bioluminescence technique. An addi-

**Figure 6.** Detection of residual food debris with a **low protein** content and a **low microbial** count (e.g., raw tomato) from wet and dry stainless steel surfaces by use of different hygiene monitoring systems

Hygiene Monitoring System	Surface	Inoculum level (dilution factor)					
		<1:10	1:10	1:50	1:100	1:1000	1:10,000
PCA spread plates	wet	Non-detectable					
	dry	Non-detectable					
PCA pour plates	wet	Non-detectable					
	dry	Non-detectable					
PCA dipslides	wet	Non-detectable					
	dry	Non-detectable					
Clean-Trace/Uni-Lite	wet	[Inoculum level detected]					
	dry	[Inoculum level detected]					
PocketSwab Plus/Firefly	wet	[Inoculum level detected]					
	dry	[Inoculum level detected]					
Hygiene Monitoring Kit	wet	Non-detectable					
	dry	Non-detectable					
Pro-tect	wet	Non-detectable					
	dry	[Inoculum level detected]					
Check-It	wet	Non-detectable					
	dry	Non-detectable					
Check Pro	wet	Non-detectable					
	dry	[Inoculum level detected]					

[Inoculum level detected] Inoculum level detected (i.e., surface "failed")

tional advantage that ATP bioluminescence has over traditional agar-based methods, especially hygiene swabs, is that it appears to be a more effective means of detecting microbial contaminants on a dry surface (Fig. 4 and 5).

Several companies now produce ATP bioluminescence systems, and increased competition has resulted in the development and launch of cheaper instruments and reagents. Two different ATP bioluminescence systems were used in this study and the results obtained were, within the limits of the experimental protocol, comparable. However, the manufacturers of the low-cost equipment believe that, to reduce costs, they have compromised on sensitivity compared to their more expensive luminometer (LUMinator T<sup>SM</sup>). Even with the advent of low-cost systems, ATP bioluminescence may still be too expensive for many smaller businesses,

especially, for example, those within the food service industry.

Many of the instrument-free tests currently available detect the amount of food debris (mainly protein) present on food contact surfaces. Very little comparison work has been conducted on these protein detection systems, probably because of their relatively recent introduction. During this investigation, their limits of detection (Fig. 2) were initially established by inoculating the surface with a protein standard (bovine serum albumen). The same pattern of sensitivity was seen when the tests were used to detect realistic food debris. The ability of any hygiene monitoring device to remove organic debris from a surface will, to a certain extent, be influenced by the swabbing or sampling procedure used (6). The degree of pressure applied to any such test is very difficult to quantify and, with regard to the

protein tests used during this study, equally difficult to standardize. Differences in their design dictated the pressure that could be applied to each test. This, it is believed, led to differences in the amount of protein being removed from the surface and, consequently, the apparent differences in test sensitivity. There are also the differences in the test format to consider; Pro-tect has a larger swab than does the Hygiene Monitoring Kit and as a result is potentially capable of picking up greater amounts of bioburden from a large area.

When used to detect the presence of high-protein residues, the most sensitive protein detection tests were superior or comparable to ATP bioluminescence (Fig. 3 and 4). It is important that hygiene monitoring methods are capable of detecting dry product residues, and results from a research study evaluating cleaning practices suggest



that the majority of surfaces in the retail and service industries are dry (7). Protein detection methods do appear to be equally effective in detecting residual high-protein food debris from both wet and dry surfaces and therefore may be of use to businesses involved in the production of high-protein foods but unable to afford to utilize the ATP bioluminescence technique. The subjectivity involved in interpreting the results of these protein tests, however, raises issues regarding the reproducibility of this method of hygiene monitoring. Although these tests are based simply on a basic color change, intermediate levels can be identified. These can manifest as either differences in the amount or intensity of the color (as is the case with Check-It and Check Pro) or a mixture of two colors (as with the Hygiene Monitoring Kit and Pro-Test). Interpretation was found to be particularly awkward when the surfaces were marginally unclean.

The fundamental difference, however, between ATP bioluminescence methods and protein detection methods is the inability of the latter to detect the presence of even very high levels of bacteria (Fig. 1). Therefore, in food processing environments where any residual food debris is likely to be low in protein, surfaces may have thousands of bacteria on them but still pass the protein tests (Fig. 5). This situation has been described during a study assessing the risk of bacterial cross-contamination from cutting boards (26) and emphasizes the importance of caution in interpreting results obtained by this method of hygiene monitoring.

Visual inspection of surfaces after they are cleaned can reveal gross deficiencies caused by the presence of visible food debris (8). Despite the wide use of visual inspection, however, most food operations require information on surface cleanliness that extends far beyond the sensitivity of this test (19). Use of protein detection methods can indicate that a surface is free of residues relatively high in protein,

but to indicate the level of organisms present, monitoring must involve some form of microbiological testing.

The relative sensitivities of different hygiene monitoring systems have been determined under controlled laboratory conditions. When, how and what is sampled within the factory environment is, however, extremely variable and, it is therefore possible that differences in the relative performance of these tests may occur *in situ*. For example, cleansers and sanitizers have been shown to reduce the sensitivity of the ATP bioluminescence technique by quenching the light signal (27). Additionally, in this study the bioburden was only given 1 h to adhere to the surface, whereas in a factory environment this time could be considerably longer, possibly resulting in it becoming more difficult to remove. Factory trials are, therefore, recommended prior to developing a monitoring strategy; however, it must be recognized that in factory conditions it is difficult to standardize the level of bioburden present.

The results of this laboratory-based investigation confirm that given the variability in food debris and surface contamination, no one method is ideal for assessing cleanliness and consequently, that the method used should be dependent on the type and amount of organic soil and microbial load likely to be present. This needs to be considered in relation to the cost of cleaning and assessing cleanliness as well as to the need for rapid results. Microbiological testing takes too long for data to be obtained and while it is useful in the validation of cleaning protocols, rapid tests such as ATP bioluminescence or protein detection will need to be used in conjunction with visual assessment for monitoring surface hygiene.

The ease with which surface contamination can be evaluated with methods such as ATP bioluminescence and protein detection means that non-technically trained staff can now carry out hygiene monitoring. It is therefore important that adequate training should be given with regard to interpreta-

tion of results obtained from these rapid hygiene monitoring methods, to ensure that the correct remedial action can be implemented.

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## 3-A Third Party Accreditation Meeting

August 3, 2001

10:00 a.m. - 5:00 p.m.

Minneapolis Hilton  
Minneapolis, Minnesota

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# Are Gloves the Answer?

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## SUMMARY

The use of gloves of various types, which are employed for their protective qualities, is an indispensable part of many occupations. Gloves are now being seriously considered as a means to decrease the infectious hazards presented by ill or asymptomatic food workers during food preparation. Used in this manner, their main importance may lie in a mere perception of a safety advantage resulting from a decrease of consumer food-safety anxieties. Real protection of the food chain through glove use may be more elusive and dependent on numerous factors.

## INTRODUCTION

The National Advisory Committee on Microbiological Criteria for Foods (NACMCF) recently concluded that available data are insufficient to support a blanket prohibition of food worker bare-hand contact with ready-to-eat (RTE) food. In 1998, the subject of bare-hand contact with RTE food was debated at the Conference for Food Protection (Council III). As an outcome of this conference, the NACMCF was to provide a definitive opinion as to the advisability of adding a no-bare-hand-contact provision to the

FDA Food Code. Although food handling implements, bakery papers and napkins and gloves are approved alternatives in food service, this provision still is considered by the industry as a "Glove Rule". Regulations prohibiting bare-hand contact are viewed by the industry as unnecessary, expensive, and potentially dangerous to workers and patrons alike. Even though the FDA sees gloves as a last resort, if the NACMCF had found evidence to support a bare-hand prohibition, gloves would become universally used in food retail establishments.

## Glove efficacy

In reviewing the information available on foodborne illness related to poor personal hygiene on the part of the food worker, many instances of gross dereliction of even the most basic rules of hygiene or safe food preparation are seen (4). To many, it would appear that hygiene/food safety training rather than a blanket prohibition might have a greater overall effect on food safety. The data indicate that, since New York State imposed a no-bare-hand-contact rule in 1991, there has been an overall decrease in foodborne illness outbreaks and no outbreaks where gloves were being used (8). However, these data are insufficient to show that prohibition of bare-hand contact, by itself, was responsible. Part of the problem is that multiple interventions were phased in at the same time, effectively masking any possible individual effects (8). There was increased awareness of the part played by infected food handlers, an increase in education and training at all levels, and reinforcement by way of increased scrutiny on the part of management and inspector forces. It has been suggested that the improvements seen in foodborne illness outbreak rates in New York State may have resulted from the halo effect related to increased training rather than from the prohibition of bare-hand contact.

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A similar difficulty exists in showing the effectiveness of handwashing or glove use individually in health care settings. Even with over one hundred years of use of gloves in surgical/clinical practice, few scientific data are available on the absolute effectiveness of gloves used in medical applications (1). There are no controlled studies of infection rates with surgeons operating barehanded versus gloved. In patient care situations, glove use is seen to have an impact only in very high-risk populations (1). There is no evidence for efficacy of glove use in normal health care situations, in part because of the difficulty of measuring the independent effect of gloves among a host of interventions.

### Unintended consequences

In various presentations to the NACMCF, gloves were severely criticized on a number of grounds, raising the concern that if glove use were mandated as a food safety initiative, unintended consequences might negate any potential safety gains. In the health care field, gloves are said to be overused, underused, and misused (1). Both supporters and detractors of glove use agree that gloves are not a substitute for proper and effective washing of hands (1, 4, 5). If gloved hands or bare hands are used incorrectly, then negative consequences can occur. The following information is relevant to the glove argument.

The obvious objective for glove use in food processing/service establishments is to prevent pathogen transmission from infected food workers to food. Because ill workers have been responsible for numerous outbreaks of foodborne illness, a no-bare-hand-contact rule would seem to be a good place to start (8). Such a rule would cover pre-symptomatic excretors or asymptomatic carriers, along with all other workers (4, 8). Intact gloves have been shown to be capable of both providing barrier protection to hands and preventing pathogen transmission (1, 4). As such, they

are widely used in the food processing industry to protect hands from hazards and to reduce product contamination. This type of task-appropriate use of gloves has almost universal support within the food industry. However, those opposed to a blanket rule feel that there are many tasks for which gloves are inappropriate and in which they would introduce unacceptable hazards. A question worth considering is whether the outcome would in fact justify the additional cost incurred by food service entities; after all, at the end of the day there is no difference between a bare hand and a gloved hand if a worker touches his or her nose, or handles raw food and then has contact with RTE food.

Numerous health care and food safety experts believe that glove use creates a false sense of security, with users taking on a "holier-than-thou" demeanor (1) that can cause users to engage in risky food handling practices or activities resulting in cross-contamination. Food workers may even touch things with gloves that they wouldn't touch with a bare hand. Some food safety experts have suggested that the only time food workers should wear gloves is when they use the toilet. However, although some believe that gloves are responsible for this false sense of security, others believe that the real problem is ignorance of the reality of disease transmission.

### Glove change compliance

In numerous instances, use of gloves has been shown to reduce handwashing, despite the fact that microbial counts increase on hands because of skin occlusion (1, 5). Gloves become contaminated during use, and without clear directives involving the required frequency of changing, workers are apt to wear gloves for longer-than-acceptable periods involving multiple tasks. In theory, gloves should be changed when they become contaminated; examples of this include after they have been coughed or

sneezed on, or after the hair, face or contaminated contact surfaces have been touched. Application of new gloves becomes critical when job activities change, especially when the change consists of switching from handling raw food to handling cooked or RTE food. Considering that handwashing compliance is below 50% for almost every group studied, and no reliable data exist for the food industry, it is doubtful that glove changing compliance with commensurate hand-washing will take place. Hospital outbreaks have been linked to failure of workers to change contaminated gloves (9), so this concern appears to be well founded.

### Glove punctures

An additional problem with glove use is the danger of punctures. When a glove is punctured, what has been described as a "liquid bridge" of microbial contamination can flow to contact surfaces (2). Studies have shown that up to 18,000 *Staphylococci* can pass through a single glove hole during a 20-minute period, even though the hands had been scrubbed for 10 minutes prior to gloving (4). The risk of poke-through during use makes fingernail length and condition important, as sharp or jagged fingernails can cause a glove break or puncture. Rings with protruding features also can cause glove punctures (5). However, it seems that glove breaks can be ascribed not only to work accidents or risky food handling procedures, but also to defects in the gloves as received from the manufacturer (3), with defect rates varying according to the glove material, manufacturing process, thickness, and grade. Despite standards for gloves used in health care (ASTM D5151) that allow water leak failure rates of 4% or less, no such standard exists for food service gloves, even though failure rates can run as high as 50% (3). To reduce the risks associated with defective gloves, surgeons have taken to the practice of double-gloving and the use of electronic puncture monitors.

Apparently, even intact gloves can have micro defects that allow the passage of viruses through the glove material (5). With fluid swishing around in lower-quality food-grade (as opposed to medical), gloves an infective hazard could result from the dislodging of viruses from the skin of the hand and from under the fingernails; these viruses could then pass through the glove and potentially be transferred to food. Company purchasing decisions can affect this type of potential hazard. Aggressive purchasing agents are prone to view quantity/cost relationships as their sole guideline. As was pointed out at a National Sanitation Foundation (NSF) conference on food safety, this approach is an enemy of HACCP (10). Glove selection must be based on a number of factors to successfully accommodate the worker, food product, and the process environment.

#### Glove quality issues

Many types of glove materials, with a variety of specific characteristics pertinent to overall functionality, are now available. However, under conditions of use, they are subjected to chemical and physical stresses that alter their barrier properties. For example, at the NACMCF meeting, lightweight gloves that were worn for peeling a shrimp were quickly punctured. These loose-fitting gloves clearly had not been designed for the task at hand. In Europe, because of the concern that gloves (or pieces of gloves) could accidentally end up in food, gloves are commonly required to be colored blue for easy detection. One concern expressed here is that if a blanket no-bare-hand-contact rule were to go into effect, the tips of contaminated, thin, poor-quality gloves could start ending up in sandwiches and other food items.

The initial microbial quality of gloves varies; certain hospital nosocomial disease outbreaks have been linked to glove contamination from the manufacturer. In addition, gloves easily can be contaminated

on their outer surfaces while being put on hands (5). If the hands are not dry, microorganisms left on the skin surface can more easily contaminate the gloves, because wet hands transfer bacteria better than dry ones. Wet hands also make glove donning difficult, as hands and gloves tend to stick together, further increasing the possibility of contamination. Potentially hazardous transient flora may not multiply significantly in or on gloves, but their viability has been found to be prolonged compared to viability on bare hands. This increases the likelihood of bacterial transfer over extended periods of time. Gloves can be contaminated during use by contact with parts of the body, raw food, contaminated surfaces, money, or wiping cloths. Depending on the glove material, in some cases bacteria have been shown to attach more easily to gloves than to hands. Removal of bacteria from gloves also varies according to material, with some materials releasing bacteria more readily than do hands. Finally, not all glove types age gracefully. It has been suggested that certain unpowdered gloves, under adverse shipping conditions or periods of extended storage, deteriorate with respect to barrier effectiveness.

#### Reuse and dexterity

Because of the cost of gloves, many people have advocated reusing them, either by washing them on the hands or by putting them through a washing procedure after they are removed. It has been found that even after washing, gloves can remain contaminated (4). The stretchiness so prized with latex gloves allows microorganisms to become trapped in the three-dimensional latex lattice structure, from which they may be released later when the gloves are stretched (4). After washing, gloves often are found to be punctured. Because glove types vary widely as to chemical permeability when chemical or food solvents are used; glove selection must be done with care. Like-

wise, glove materials are affected differently by chemical disinfectants; some are broken down by the destructive effects of disinfectants, predisposing them to puncture and tear, and if these destructive agents then are used to wash gloves for reuse, punctures and breaks are a near certainty. Washing of gloves on the hands risks introduction of water and allergens from food, sanitizers, and antimicrobial soaps. It also extends the time for which gloves are kept on the hands, causing greater increases in microbial counts and negative skin changes.

Although the palm of the hand and the finger pads completely lack sebaceous glands and hair, they contain 400-500 sweat glands/cm<sup>2</sup> and thus produce prodigious quantities of sweat (11). Glove tightness, through its effect on the amount of air circulation, will influence the degree of sweating. Studies in the health care field have shown that hand skin health is generally inversely related to glove use (5), because long-term exposure of the hand to wet glove conditions causes skin maceration and damage to the *stratum corneum*, pH changes, and impairment of barrier function. Unfortunately, although looser gloves probably improve air circulation and skin health, they also increase the degree to which gloves can become cumbersome, increasing the risk of microbial pick-up and transfer. Tight gloves can cause discomfort, and both extremes are associated with a loss of dexterity that increases the risk of mechanical or thermal injury to the user (4).

As noted in the health care field, skin occlusion by gloves can have serious consequences, such as fissures and colonization, the latter of which is aggravated by or a result of instances of allergic contact dermatitis (1, 5, 12). Occlusion can support multiplication of the microorganisms associated with the hand and fingernails, as well as causing population shifts. Eventually, microorganisms associated with nail regions are spread over larger parts of the hand within the glove. For this reason, it is as important to wash hands after using gloves as it is before.

## Allergic contact dermatitis

Contact dermatitis is the most frequent type of occupational skin disease (7). Occupational skin diseases account for approximately 40% of all occupational illnesses, according to the Bureau of Labor Statistics (7). Women seem to be more prone to having a history of atopic disease and/or becoming sensitized to potential allergens than men are. Wet work of the type found in food and health care industries increases the potential for skin problems of this type (6, 7). Known allergens associated with food preparation consist of facility sanitizers and disinfectants, and metals such as chromium and nickel in stainless steel or jewelry. In addition, food allergens, antimicrobial ingredients found in soaps and sanitizers, and allergens associated with gloves can cause contact dermatitis.

Several factors together are known to increase the propensity for skin sensitization to occur, and they are all found in food processing/service environments. It has been known for some time that in conducting sensitization maximization tests in animals, it works best if skin is abraded, an allergen potentiator is used, and the skin is occluded. In the food processing/service environment, the sources listed previously include known allergens, and the skin is often abraded with brushes or through cutting, scratching, or otherwise damaging the skin during food preparation through contact with machinery or food. Scalding the skin with hot water or caustic chemicals can produce an effect similar to physical damage caused by scrapes and scratches. Allergen potentiators exist as ingredients of many of the soaps and sanitizers used in the food industry. Finally, when hands are put into gloves, the occlusion is provided that favors the development of allergic contact dermatitis (12). This explains why glove ma-

terials often cause contact dermatitis. Several glove materials are allergenic, such as those in which natural rubber protein is present. Natural rubber, neoprene, latex and PVC have all been associated with glove allergies (1, 4). The recently adopted Modified Lowery Test (ASTM D5712) is now the basis for determination of latex allergy potential. Chemical additives such as thiuram, carbamate and thiazole, glove powder, and bacterial endotoxins have also been shown to be responsible for allergic contact dermatitis associated with gloves. The Human Draize test (ASTM D6355) now forms the basis for an FDA-approved claim of "Low Dermatitis Potential".

## CONCLUSIONS

A great deal of information is available on the negative aspects of glove usage. As a result of the heavy reliance on gloves and subsequent careful documentation of associated problems in the health care field. Research is currently under way to assess the positive effects of glove use on reducing disease transmission in the food service environment. Until those data are in, however, we must rely on the same common-sense prerequisite programs that form the foundation of most HACCP based systems – conscientiously employed handwashing practices. In situations where handwashing is elevated to a CCP, it should be Monitored, Documented, and Verified (MDV), with bare hand contact avoided or eliminated.

Many pros and cons are associated with glove use. In theory, there is no reason why gloves can't be used properly and effectively. Abuse and drawbacks may be only a matter of training. One thing I know for sure: when the surgeons open me up, I hope they have washed their hands carefully and are wearing two pairs of top quality gloves – one pair for them and one pair for me.

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# Kathleen A. Glass

## Elected IAFP Secretary



**T**he International Association for Food Protection welcomes Kathleen A. Glass to the Executive Board as Secretary. Ms. Glass will take office at the conclusion of the Awards Banquet at IAFP 2001, the Association's 88th Annual Meeting in Minneapolis, Minnesota. By accepting this position, she made a five-year commitment to the Association and will serve as President in 2005.

Ms. Glass is a Food Safety Microbiologist at the Food Research Institute at the University of Wisconsin-Madison. She designs and coordinates microbial challenge studies and assists the food industry in developing formulation-safe foods. Her research interests include the safety of low acid refrigerated foods, processed meat and process cheese products,

focusing on the control of *Clostridium botulinum*, *Listeria monocytogenes*, and *Escherichia coli* O157:H7.

Ms. Glass has been an active Member of IAFP and its Wisconsin Affiliate (WAMFS) since 1990. Within IAFP, she has served as a member of the Program Committee, Meat and Poultry Safety and Quality Professional Development Group, Nominating Committee, Black Pearl Selection Committee, and as Chairperson of the Developing Scientist Awards Committee. She has organized and chaired numerous Annual Meeting symposia as well as presented technical papers. On the local level, she was elected to the WAMFS Executive Board in 1999 and will serve as President during the 2001-2002 term. Ms. Glass is the 2001 Conference Chairperson for an annual conference held jointly between WAMFS and Wisconsin Environmental Health Association and Wisconsin Association of Dairy Plant Field Representatives.

In addition to IAFP and WAMFS, Ms. Glass is a member of the Institute of Food Technologists, American Society of Microbiology, and Sigma Xi. She has published 17 scientific papers, has been an invited speaker at numerous workshops on food microbiology, dairy HACCP, process meat safety, and *Listeria* control methods, and is a guest lecturer for undergraduate and graduate UW-Madison courses in food bacteriology and food fermentation.

Ms. Glass received her undergraduate degree in Biology from the University of Wisconsin-Eau Claire. She taught high school biology for four years before earning her Master's of Science degree from Northern Illinois University in 1985. She joined the Food Research Institute in 1985, and is also currently completing a Doctorate in Food Microbiology and Safety at the University of Wisconsin-Madison.

# Congratulations!

# Highlights of the Executive Board Meeting

April 23 – 24, 2001

Des Moines, Iowa

Following is an unofficial summary of actions from the Executive Board Meeting held April 23-24, 2001 in Des Moines, Iowa:

## Approved the following:

- Minutes of January 21-22, 2001 Executive Board Meeting
- Minutes of January 21, 2001 Executive Board Executive Session
- E-mail votes taken since the January 22, 2001 Executive Board Meeting
- Change to Employee Manual to add holiday for IAFP staff to use on one of the following Holidays: Martin Luther King Day, Presidents' Day, Good Friday, Rosh Hashanah, Yom Kippur, Columbus Day, Veterans' Day, Hanukkah, Kwanzaa
- Implementation of a Section 125 Cafeteria / Flexible Spending Account for Employees
- Fiscal Year End August 31, 2002 budget including adjustments to subscription rates, page charges, shipping and handling on booklet orders, IAFP 2002 registration rates and exhibit fees
- *JFP* Editor Selection Committee's recommendation to appoint Joseph Frank to replace Larry Beuchat as of December 31, 2001 and to appoint Michael Davidson as a third Scientific Editor effective January 1, 2002
- Web page guidelines for Committees, Professional Development Groups and Task Forces
- Granting Honorary Life Memberships to John Cerveny, Robert Tiffin, and Edmund Zottola
- To spend 25% of the amount collected each year by the Sustaining Member Speaker Support Fund over the next five years (ending August 2006) to enable establishment of a principal amount on which interest and dividends may accrue

## Discussed the following:

- Communication Update: Reports on *DFES*, *JFP* and the Web site were accepted. *DFES* submission rate still needs a boost – discussed alternative methods to generate submissions. *JFP* submissions continue to increase at a rapid rate. Web site expansion continues – E-commerce use steadily increasing
- Membership Update: Membership at same level as last year—need Member involvement to generate new Members. One Gold and four Silver Sustaining Members help reach goal of 10 by year-end
- Advertising / Exhibits Update: Ad revenue out-pacing last year. Exhibit Hall reservations for IAFP 2001 stand at approximately 78% of capacity and sponsorship developing nicely – 133% of last year's total committed for this year
- Financial Update: February financial statements were presented. Investment accounts continue to suffer declines
- Spring Affiliate Newsletter mailed in April
- Affiliate organizations were reminded to bring items for the Foundation Fund's Silent Auction to IAFP 2001

- IAFP Officers made presentations to five Affiliate organizations this spring. Two are scheduled for late spring, two for summer and four are scheduled for fall meetings
- Affiliate Delegates and Presidents must be IAFP Members per IAFP Bylaws – 11 of 74 are not in compliance
- Affiliate Annual Reports received from 27 of 37 Affiliate organizations. Follow-up letters were sent and calls will be made
- Kentucky's invitation to host the Annual Meeting
- Seven Affiliates have adopted new names that contain the same format as the International Association for Food Protection's name. Four others have a similar format ("name" Food Protection Association)
- PDG mission statements. All PDG mission statements will be sent to Chairpersons and Vice Chairpersons
- 2001 Award recipients
- Committee Member and Chairperson appointments to be effective August 5, 2001
- Microbial Risk Analysis PDG document
- *DFES* business plan
- Journal readership survey and Member needs assessment
- Tours and social events to be held at IAFP 2001
- Local Arrangements Committee meeting
- Planning for 2001 and 2002 Annual Meetings
- Future Annual Meeting site selection
- Annual Meeting Workshop topics – (1) Laboratory Methods, (2) HACCP and (3) Recall Communications
- Produce safety workshop for Agritrade in Guatemala, November 15, 2001
- Results of IAFP on the Road – United Fresh Fruit & Vegetable Association March 17, 2001 and Food Safety Summit April 17, 2001
- IAFP on the Road – Worldwide Food Expo, October 18, 2001
- Updated sections for the IAFP Policy and Procedures Manual
- World Health Organization – continue process to become a non-governmental organization (NGO) designee of WHO
- Attendance at PAHO/WHO RIMS XII meeting in São Paulo, Brazil
- Establishment of a Corporate Challenge to raise funds for the IAFP Foundation
- Development of an "International Award" to be given at IAFP 2002
- Secretary election results
- Public Library of Science
- Provide door prizes for IFT's Student Reception
- Awards Committee to revise Awards criteria

Next Executive Board Meeting: August 3-9, 2001 in Minneapolis, Minnesota



# NOTIFICATION OF PROPOSED AMENDMENTS TO THE INTERNATIONAL ASSOCIATION FOR FOOD PROTECTION BYLAWS

Membership vote to take place at IAFP 2001 Business Meeting

August 7, 2001

4:00 p.m.

Minneapolis Hilton  
Minneapolis, Minnesota

The following two proposals to amend the International Association for Food Protection Bylaws will be voted on at the Association's Business Meeting. A majority affirmative vote of the members present is required for acceptance.

**Proposal 1:** To change Bylaws Section V, B, 1.11 to read as follows:

#### 3-A Committee on Sanitary Procedures

The 3-A Committee on Sanitary Procedures shall consist of a Chairperson and Vice Chairperson recommended by the President-Elect and confirmed by the Executive Board. The Chairperson, subject to the Executive Board's review shall appoint other committee members. All appointments shall be for 2-year renewable terms. The 3-A Committee on Sanitary Procedures shall:

- 1.11.1 Serve as IAFP representatives to the 3-A Sanitary Standards Committee; and
- 1.11.2 Review and provide comments on proposed changes and revisions to the 3-A Sanitary Standards.

**Rationale:** This change reflects the new committee name, "3-A Committee on Sanitary Procedures" requested by the Committee and approved by the Executive Board.

**Proposal 2:** To change Bylaws Section V, C, 1.3 to read as follows:

Current PDGs include, Applied Laboratory Methods, Dairy Quality and Safety, Food Safety Network, Food Sanitation, Fruit and Vegetable Safety and Quality, Meat and Poultry Safety and Quality, Microbial Risk Analysis ~~Microbial Food Safety Risk Assessment~~, Seafood Safety and Quality, Student, Viral and Parasitic Foodborne Disease.

**Rationale:** This change reflects the new PDG name, "Microbial Risk Analysis" requested by the PDG and approved by the Executive Board.

Changes shown in red.

# CALL FOR SYMPOSIA

## IAFP 2002

JUNE 30–JULY 3, 2002

SAN DIEGO, CALIFORNIA

The Program Committee invites International Association for Food Protection Members and other interested individuals to submit a symposium proposal for presentation during the 2002 Annual Meeting, June 30–July 3, 2002 in San Diego, California.

### WHAT IS A SYMPOSIUM?

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

### SUBMISSION GUIDELINES

To submit a symposium, complete the Symposium Proposal form. The title of symposium; names, telephone numbers, fax numbers, and complete mailing addresses of the person(s) organizing the symposium and convenors of the session; topics for presentation, suggested presenters, affiliations; description of audience to which this topic would be of greatest interest; and signature of organizer. When submitting a proposal, the presenters do not need to be confirmed, only identified. Confirmation of presenters takes place after acceptance of your symposium.

### SYMPOSIUM FORMAT

Symposium sessions are 3 and 1/2 hours in length including a 30-minute break. A typical format is six 30-minute presentations. However, variations are permitted as long as the changes fit within the allotted time frame. If varying from the standard format, be sure to indicate this on the Symposium Proposal form.

### SYMPOSIUM PROPOSAL DEADLINE

Proposals may be submitted by mail to International Association for Food Protection office for receipt no later than July 16, 2001 or by presenting the proposal to the Program Committee at its meeting on Sunday, August 5, 2001 in Minneapolis, Minnesota. Proposals may be prepared by individuals, committees, or professional development groups.

The Program Committee will review submitted symposia and organizers will be notified in October 2001 as to the disposition of their proposal.

### PRESENTERS WHO ARE NOT MEMBERS

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

### ASSOCIATION FOUNDATION SPONSORSHIP

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

### HAVE AN IDEA BUT YOU ARE UNABLE TO ORGANIZE IT?

Many Association Members have excellent suggestions for symposia topics, but are unable to organize the session. Such ideas are extremely valuable and are welcome. If you have an idea for a symposium topic, please inform the Program Committee Chairperson as soon as possible. Symposia topics are among the most valuable contribution an Association Member can make to assure the quality of our Annual Meeting.

### WHO TO CONTACT:

Bev Corron  
International Association for Food Protection  
6200 Aurora Ave., Suite 200W  
Des Moines, IA 50322-2863, USA  
Phone: 800.369.6337; 515.276.3344  
Fax: 515.276.8655  
E-mail: bcorron@foodprotection.org

# SYMPOSIUM PROPOSAL

## IAFP 2002

JUNE 30–JULY 3, 2002

SAN DIEGO, CALIFORNIA

Title: \_\_\_\_\_

Organizer's Name: \_\_\_\_\_

Address: \_\_\_\_\_

Phone: \_\_\_\_\_ Fax: \_\_\_\_\_ E-mail: \_\_\_\_\_

Topic – Suggested Presenter, Affiliation

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

1. \_\_\_\_\_

2. \_\_\_\_\_

3. \_\_\_\_\_

4. \_\_\_\_\_

5. \_\_\_\_\_

6. \_\_\_\_\_

Suggested Convenors:

\_\_\_\_\_  
\_\_\_\_\_

Description of Audience: \_\_\_\_\_

Signature of Organizer: \_\_\_\_\_

Receipt by mail  
by July 16, 2001 to:

International Association for Food Protection  
Symposium Proposal  
6200 Aurora Ave., Suite 200W  
Des Moines, IA 50322-2863, USA

Submit in person  
on August 5, 2001 to:

Program Committee  
Hilton Minneapolis  
Minneapolis, MN

or Contact:

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DQCI Services, Inc., Mounds View Business Park, 5205 Quincy St., Mounds View, MN 55112  
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**Gary A. Dykes**  
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**Tim Ellis**  
Campbell Soup Co. Ltd.  
Listowel, Ontario

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## TURKEY

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**Peter Esko**  
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**Anastasia G. Lolos**  
The Perrier Group, Pasadena

**Yolande J. Sterling**  
Clorox Services Co., Pleasanton

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**Robert A. Johnson**  
ConAgra, Athens

### Idaho

**Edward A. Rose**  
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Nampa

**Filomena S. Saddler**  
RMR Labs Inc.  
Jerome

## Illinois

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Chicago

**Ginger Fisher**  
D.F.G. Foods, L.L.C.  
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## Kansas

**Erdogan Ceylan**  
Kansas State University  
Manhattan

**Dennis D. Foster**  
NEK Environmental Services  
Troy

**Christiane Schroeter**  
Kansas State University  
Manhattan

## Kentucky

**Jennifer Zaffarano**  
University of Kentucky  
Lexington

## Louisiana

**Javed Rashid**  
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## Maryland

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FDA, Mount Rainier

## Michigan

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Food & Dairy, Lansing

**Carol A. Sawyer**  
Michigan State University  
East Lansing

## Missouri

**Stanton Farmer**  
Missouri Dept. of Health  
Springfield

**Hugh Mooney**  
Montgomery Co. Health Dept.  
Rhineland

**Russ Robbins**  
JEM Consulting Services  
Springfield

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Hackettstown

**Kelly M. Shaw**  
M & M/Mars, Vernon

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**Erin Natuig**  
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University of Wisconsin-Madison  
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# Updates

## **Alex Malaspina Retires from ILSI; New Leadership Fills the Breach**

After 23 years of service, Dr. Alex Malaspina has retired as president of ILSI and ILSI North America (ILSI N.A.) He was instrumental in founding ILSI in 1978 and has presided over its growth from an organization of a small group of food and beverage companies to the truly global organization it is today serving more than 300 diverse member companies worldwide. At the ILSI Annual Meeting in January 2001, Dr. Malaspina handed over the reins to Dr. James Stanley, who will serve as ILSI president, and Dr. James Behnke, who has been named president of ILSI N.A.

Dr. James W. Stanley brings to ILSI's presidency a strong institutional history with the organization, broad technical skills, and in-depth managerial expertise. Dr. Stanley recently retired as vice president of scientific and regulatory affairs worldwide for The Pepsi-Cola Company.

Dr. Stanley earned his B.A. in chemistry and biology from Murray State University, and his doctorate in medicinal chemistry from the University of Tennessee Medical Units.

After a career of more than 25 years with the Pillsbury Company and long service on ILSI's Board of Trustees and Executive Committee, Dr. James R. Behnke has both the experience and the expertise to lead ILSI North America as president. He served as Pillsbury's senior vice president for worldwide technology and as chief technical officer from 1979 to 1999.

Dr. Behnke received his B.S. in chemistry, his M.S. in food

science, and his Ph.D. in food chemistry from the University of Wisconsin, Madison.

## **Six Elected to IAFIS Board of Directors**

The membership of the International Association of Food Industry Suppliers (IAFIS) elected six of their industry peers to serve on the 2001-2002 IAFIS Board of Directors. Elections were held March 23-24 at the IAFIS 2001 Annual Conference.

Of the six Board seats, four are at-large positions and two are industry segment directors in the processing and support services areas. Each of the following directors will serve a three-year term, expiring in 2004: Lou Beaudette, Admix, Inc., Manchester, NH, is the newly elected processing director; David Bryant, The David Bryant Company, Roswell, GA, is the newly elected support services director; Michael Kays, Johnson Truck Bodies, New Lisbon, WI, is a newly elected at-large director; Dick Lacana, Global Packaging Machinery Business at Evergreen Packaging Equipment/International Paper, Cedar Rapids, IA, was re-elected as an at-large director; Camilla Nielsen, Nielsen-Massey Vanillas, Waukegan, IL, was re-elected as an at-large director; and Tom Riggins, Holmatic (division of Packaging Technologies), Davenport, IA, is a newly elected at-large director.

## **Silliker Appoints Deborah Hockman Vice President of Quality Management and Technology**

Deborah C. Hockman, Ph.D., was promoted to vice president of quality management

and technology for Silliker Laboratories' operations. In her newly created role, Dr. Hockman will standardize laboratory operations and safety policies, institute business improvements through a commitment to best practices and new technologies, and oversee the integration of acquisitions into the expanding Silliker international network.

Dr. Hockman joined the Silliker organization in 1999 as vice president of operations (US) following 18 years of executive and management experience in the pharmaceutical and environmental industries. She was promoted to senior vice president of North American operations last year. Under her leadership, Silliker facilities successfully consolidated its analytical chemistry testing services, streamlined operations and improved financial performance through strict internal quality systems, and recruited several top food industry scientists and professionals.

A graduate of Loyola University (Chicago) with a Ph.D. in analytical chemistry and an active member of several professional societies, Dr. Hockman is a recognized expert on laboratory management, analytical method development, and laboratory automation.

## **Renaissance Industries Appoints Vice President of Technology**

Wayne Cain, formerly general manager of the Renaissance Industries facility in Laurinburg, NC, has been promoted to the newly created position of corporate vice president of technology.

Cain begins his new assignment after five years in his

previous position. He has more than 20 years of manufacturing experience.

### **Romero® Labs Announces Maja Nikuseva as Area Manager—Europe**

Romero Labs, Inc. is pleased to announce that Ms. Maja Nikuseva has joined the company as area manager – Europe. Maja joins Romero® Labs from Lackner, where she worked in sales and feasibility studies for mycotoxin rapid analysis systems in Eastern Europe. She has also done work in marketing, marketing research and quality control for several European companies.

Maja studied chemical technology at the University of Belgrade, Yugoslavia, and earned a master of science degree in analytical and physical chemistry from the University of Technology in Vienna, Austria.

### **Dairy Farmers of America, Inc. Seats New Board of Directors for 2001**

Board officers elections held March 30, resulted in Herman Brubaker, West Alexandria, OH being re-seated as chairman. The cooperative's 2001 slate of officers include: Tom Camerlo first vice chairman, Florence, CO; Charles Beckendorf, vice chairman, Tomball, TX; Bill Siebenborn, vice chairman, Trenton, MO; Randy Mooney,

secretary/treasurer, Rogersville, MO. As officers, they will serve on DFA's Executive Committee along with Lew Gardner, Galeton, PA; Tom Croner, Berlin, PA; Calvin Buchanan, Decatur, TX; and Ray Veldhuis, Winton, CA.

### **Advanced Instruments Names New President**

Blanton C. Wiggan, Board Chairman of Advanced Instruments, Inc., Norwood, MA, announces the appointment of John L. Coughlin as president and chief executive officer.

Mr. Coughlin received his undergraduate degree in physics from Georgetown University, Washington, D.C. and his master of science degree in the same specialty from Northeastern University, Boston, and attended Babson College in the MBA program. Most recently he was president and CEO of Benthos, Inc., North Falmouth, MA. Prior to that he was president of Dynisco Instruments, Canton and earlier was executive vice president of Rexa Corporation, Randolph, and vice president of sales and marketing at BLH Electronics, Canton, MA.

### **Levy Joins Bell Laboratories, Inc. as General Manager**

Bell Laboratories welcomes Steve Levy, its new general manager. He will be overseeing

all aspects of Bell business, from sales and marketing to product development and research.

Previously, Levy was the vice president and general manager of the consumer product division for Oil-Dri Corporation of America, a manufacturer of sorbent products. Before Oil-Dri, Levy worked in management and marketing positions for Bayer, the Golden Cat Corporation, Nestlé Foods, and other companies.

Levy holds an MBA from University of North Carolina at Chapel Hill. Levy also earned a dual bachelor's degree in economics and psychology from University of California at Los Angeles.

### **Three Appointed to IAFIS Foundation Board of Directors**

The Foundation of the International Association of Food Industry Suppliers (IAFIS) Board of Directors appointed two new directors and re-appointed a sitting director at its March 21 meeting, held in conjunction with the IAFIS 2001 Annual Conference.

Jack Luechtefeld, DSI Process Systems, St. Louis, MO, and Bob Sprinkman, W.M. Sprinkman Corp., Franksville, WI, were appointed to the Board to serve three-year terms ending in 2004.

The Board also reappointed Beth Kloos, Haynes Manufacturing Co., Westlake, OH, to another three-year term.

Visit our Web site  
[www.foodprotection.org](http://www.foodprotection.org)

## 3-A Partners Update

The 3-A Partners group met with the IAFIS Standards and Technical Committee on March 21, 2001 prior to the IAFIS Annual Conference. The two groups reviewed four proposals that, when finished, will provide the protocol for the 3-A Symbol Authorization procedure to transition from manufacturer self-declaration to requiring a third-party audit. The four proposals outlined the (1) administration of Third-Party Accreditation (TPA) and resolving noncompliance issues, (2) auditor qualifications, (3) audit process, and (4) 3-A Symbol status for used and remanufactured equipment.

Requiring a third-party audit prior to 3-A Symbol use authorization will lessen the distribution of nonconforming equipment, thereby increasing the level of public health safety and increase confidence that 3-A Symbol-bearing equipment is compliant with 3-A Standards. Moving to TPA will allow regulatory compliance to be determined by the presence of the 3-A Symbol and lessen the need for teardown equipment inspection.

The next meeting of the 3-A Partners will be August 3, 2001, starting at 10:00 a.m. and ending at 5:00 p.m., prior to the IAFP Annual Meeting, at the Hilton Minneapolis, Minneapolis, Minnesota. This is an open meeting for answering questions on this change and for receiving comments on the proposed protocol. The protocol will be posted on the 3-A Web site by July 15.

Since this is an open meeting, we ask that you register as early as possible (no later than July 15). Register with Philomena Short or Tom Gilmore at 703.761.2600 or E-mail: pshort@iafis.org, or tgilmore@iafis.org.

Comments and questions may be submitted online by visiting the 3-A Web site at [www.3-a.org](http://www.3-a.org), or may be directed to the following participating groups:



- Dr. Warren S. Clark, Jr.  
3-A Symbol Administrative Council  
312.782.4888,  
[adpi@flash.net](mailto:adpi@flash.net)
- Dr. Tom Gilmore  
International Association  
of Food Industry Suppliers  
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## Newest Home Food Safety Study by Audits International Shows Improvement on the Decline

Improvement in home food safety practices appears to be on the decline according to the findings of the 2000 Home Food Safety Study conducted by Audits International (A.I.). This newest study, the third to be conducted since 1997, observed respondents' food safety and sanitation practices during a meal prepared in their own kitchens. Performance was measured against the same standards that restaurants are required to pass. The bottom line offers a bad

news/new news/good news scenario. The bad news: three-fourths of the population is still "doing it wrong;" the new news: homes are no better than restaurants; the good news: increasing consumer food safety awareness will net significant improvements.

According to Richard W. Daniels, president of Audits International, "We believe the root cause for the decline in improvement is due to the overall decline in negative media coverage. The extensive rate of improvement evident between our 1997 and 1999 studies was directly attributable to the public's media-driven fears about hamburgers, eggs, chicken and even lettuce. Since that time, the rate of negative media impressions has decreased, and unfortunately, so has the rate of improvement. In addition, for the first time, we were able to compare home performance with that of restaurants. Comparing our data to that in FDA's Report of the Retail Food Program Database of Foodborne Illness Risk Factors, it seems likely that half of the foodborne illness in this country results from problems at home," Daniels added.

Data for the 2000 Study was collected from a total of 115 households in 74 metropolitan areas. A.I.'s network of highly trained auditors observed food preparation, service, left-over handling and clean-up for one meal. To pass, as with the previous two studies, a home needed zero critical violations (issues which, by themselves, can cause foodborne illness). "The significance of the comparison to restaurants is huge. Whenever people get sick they immediately ask, 'Where did I last eat out?'" said Daniels.

This study suggests that the more appropriate first question should be, 'What did I eat?' An additional first, the 2000 Study probed the reasons critical violations occurred. Responses



were categorized in one of three ways: motivation – I know but don't believe it – 20% of participants; education – I didn't know – 40% of participants; and awareness – I wasn't thinking – 40% of participants.

"It's true that the average number of violations decreased slightly since 1999. Yet, nearly three out of four households still had at least one critical violation. And, even more important, is the dramatic decline in people claiming to take more food safety precautions than previously. Clearly, despite all the educational efforts, the vast majority of folks are still doing it wrong. Certainly continuing to educate people is very important," said Daniels.

The 1997 Home Food Safety Study suggested that unsafe food safety practices were commonplace in homes. The 1999 study attempted to identify the reasons for violations by determining if the circumstances were educational or motivational. In 2000, Audits International expanded the study to explore the impact of awareness on food safety.

### 'Miniature' Factory to Improve Dairy Products

Food Science Australia and Newport Scientific will join forces to develop a 'miniature' processing plant for dairy products. Food Science Australia is a joint venture of CSIRO and the Australian Food Industry Science Centre (AFISC).

An agreement signed on Friday, April 27 is expected to lead to the development of an instrument that will help dairy food manufacturers reduce the costly problems caused by fluctuations in the consistency of milk supply.

Until now the Rapid Visco Analyzer (RVA), has been used to analyze the properties of starch by the grains industry. The agreement will see the use of the RVA extended to cover complex

multi-ingredient dairy foods such as yogurt, cream cheese and ice-cream.

"Product quality control is a particular challenge for the Australian Dairy Industry because farming practices cause variation in milk composition over the season. These variations can adversely affect the properties and quality of consumer dairy products such as yogurt, cream cheese and ice-cream," says Dr. Louise Bennett from Food Science Australia.

The RVA can be programmed to replicate the processing conditions of dairy products such as yogurt. Each processing step can be controlled and the viscosity of the product measured throughout the processing cycle, allowing manufacturers to make corrections to the process or composition of the mixture.

"This allows companies systematically to investigate a real food system, with the added advantage that this investigation can now be done on a much more economical and convenient scale. The RVA can make 10-20 g of products and process multiple batches a day whereas larger-sized pilot processing plants can only produce one or two batches per day and may require thousands of liters per batch," says Dr. Bennett.

The size of the RVA will allow dairy product manufacturers to use the instrument within the factory to do regular checks on the properties of their product and make adjustments to the full-scale process if necessary.

The RVA also has the potential to be adapted for wider applications within the food and other industries.

"To address the diverse needs of the dairy and food industries, we are also interested in pushing the processing capability of the RVA beyond current limits to test products at ultra high temperatures and pressures," says Mr. Rodney Booth, managing director of Newport Scientific Pty Ltd.

### NFPA Announces Industry "Code of Practice" for Managing Food Allergens

The National Food Processors Association (NFPA) has released an industry "Code of Practice" for managing food allergens. The purpose of the Code is to delineate the general practices used by food companies that can ensure effective strategies for the management of food allergens.

"This Code is an important step forward by the food industry in addressing the issue of food allergens. The Code – which has taken more than a year to finalize – was developed with input not only from NFPA member companies but also from the Food and Drug Administration and the US Department of Agriculture, as well as the Food Allergy and Anaphylaxis Network, a consumer group addressing this issue," said Dr. Rhona Applebaum, NFPA's executive vice president of scientific and regulatory affairs.

Dr. Applebaum stated, "Food processors must be diligent in informing consumers about the presence of allergens in their products. Appropriate measures also must be taken to minimize the risk to allergic consumers of coming in contact with food allergens that – despite the use of Good Manufacturing Practices (GMPs) – are inadvertently present in a product and consequently not declared on the label."

The Code states that NFPA members subscribe to the following practices: NFPA members label, in terms commonly understood by consumers, the major food allergens in their ingredient declarations, including those that are part of natural and artificial flavors, and other food components. NFPA members use GMPs and other allergen control strategies to manage and minimize the potential cross contact of the major food allergens. These strategies include, but are not

limited to, training, separation, sanitation and scheduling.

In those instances where GMPs and other allergen control strategies are being followed but are not reliable in sufficiently minimizing the risk of allergen cross contact, then ingredient declarations or supplementary information, such as allergen labeling or inclusion of addition food allergen information, would be appropriate. NFPA members will take an active role in educating employees, business partners, ingredient suppliers, food service customers and consumers about food allergens.

NFPA and its members continue to develop processing, analytical and operational strategies to further reduce the risk to allergic consumers of ingesting food allergens.

Allergenic proteins in and derived from the following foods are the major food allergens in the United States: egg, fish, milk, peanuts, shellfish, including crustacea (e.g., crab, crayfish, lobster and shrimp) and mollusks (e.g., clams, mussels and oysters), soy, tree nuts (e.g., almonds, Brazil nuts, cashews, hazelnuts/filberts, macadamia nuts, pecans, pine nuts, pistachios and walnuts) and wheat. Ingredients made from these foods that do not contain protein are not allergenic.

### **New! "Cooking for Groups — A Volunteer's Guide to Food Safety"**

**W**hether preparing food for a family reunion or a community gathering, people who are great cooks at home don't necessarily know how to safely prepare and store large quantities of food for large groups. For this reason, USDA's FSIS' Food Safety Education Staff has developed "Cooking for

Groups — A Volunteer's Guide to Food Safety." This colorful, 40 page "Guide" will take consumers through the steps necessary to prepare and serve food for a safe and successful event.

To obtain a copy of the guide, visit [www.fsis.usda.gov/OA/pubs/cfg/cfg.htm](http://www.fsis.usda.gov/OA/pubs/cfg/cfg.htm).

### **Outbreak of *Salmonella livingstone* Infection in Norway and Sweden Due to Contaminated Fish Products**

**I**n February 2001 Folkehelse (the National Institute of Public Health, NIPH) in Oslo, Norway, observed an increased incidence of infection caused by *Salmonella livingstone*. Upon contact, Smittskyddsinstitutet (the Swedish Institute for Infectious Disease Control) in Stockholm reported that a similar increase had been detected in Sweden. A case was defined by the isolation of *S. livingstone* from feces, urine, blood, or other normally sterile sites on culture in a person staying in Norway or Sweden from December 2000. By April 5, a total of 27 cases had been recorded in Norway and 11 in Sweden. Most of these cases had gastroenteritis, but one patient presented with a urinary tract infection. The outbreak extends from Malmö in southern Sweden to Troms County in northern Norway. An urgent enquiry was sent out in February through Enternet, the European network for surveillance of salmonellosis and enterohaemorrhagic *E. coli* infection, to other European countries, but there is currently no evidence that they are affected.

Analysis of outbreak isolates by pulsed field gel electrophoresis (PFGE) showed an identical DNA profile, which differed from epidemiologically unrelated control

isolates, except from one strain obtained from sewage sludge this year. By March 31, *S. livingstone* with the same DNA pattern as the outbreak strain had been recovered from a fish product. This product, together with similar products from the implicated factory, was recalled from the market, and a public health warning was issued. The implicated products were not known to have been distributed outside Sweden and Norway. Investigations have been initiated to identify the contaminated ingredient.

An outbreak of *S. livingstone* infection was recorded in Tayside, Scotland from 1989-91. The source was not identified. A second large outbreak was recorded in Europe in 1996 and some cases were related to travel to Tunisia.

The outbreak is being investigated through cooperation between public health and food control authorities in Norway and Sweden, and Enternet has been informed regularly.

### **Reducing the Risk for Transmission of Enteric Pathogens at Petting Zoos, Open Farms, Animal Exhibits, and Other Venues Where the Public has Contact with Farm Animals**

**P**ersons providing public access to farm animals should inform visitors about the risk for transmission of enteric pathogens from farm animals to humans, and strategies for prevention of such transmission. This should include public information and training of facility staff. Visitors should be made aware that certain farm animals pose greater risk for

transmitting enteric infections to humans than others. Such animals include calves and other young ruminant animals, young poultry, and ill animals. When possible, information should be provided before the visit.

Venues should be designed to minimize risk. Farm animal contact is not appropriate at food service establishments and infant care settings, and special care should be taken with school-aged children. At venues where farm animal contact is desired, layout should provide a separate area where humans and animals interact and an area where animals are not allowed. Food and beverages should be prepared, served, and consumed only in animal-free areas. Animal petting should occur only in the interaction area to facilitate close supervision and coaching of visitors. Clear separation methods such as double barriers should be present to prevent contact with animals and their environment other than in the interaction area.

Handwashing facilities should be adequate. Handwashing stations should be available to both the animal-free area and the interaction area. Running water, soap, and disposable towels should be available so that visitors can wash their hands immediately after contact with the animals. Handwashing facilities should be accessible, sufficient for the maximum anticipated attendance, and configured for use by children and adults. Children aged <5 years should wash their hands with adult supervision. Staff training and posted signs should emphasize the need to wash hands after touching animals or their environment, before eating, and on leaving the interaction area. Communal basins do not constitute adequate handwashing facilities. Where running water is

not available, hand sanitizers may be better than using nothing. However, CDC makes no recommendations about the use of hand sanitizers because of a lack of independently verified studies of efficacy in this setting.

Hand-mouth activities (e.g., eating and drinking, smoking, and carrying toys and pacifiers) should not be permitted in interaction areas.

Persons at high risk for serious infections should observe heightened precaution. Farm animals should be handled by everyone as if the animals are colonized with human enteric pathogens. However, children aged <5 years, the elderly, pregnant women, and immunocompromised persons (e.g., those with HIV/AIDS) are at higher risk for serious infections. Such persons should weigh the risks for contact with farm animals. If allowed to have contact, children aged <5 years should be supervised closely by adults, with precautions strictly enforced. Raw milk should not be served.

### **Food Safety: Overview of Federal and State Expenditure Report to Congressional Requesters**

**F**oodborne illness in the United States is an extensive and expensive problem. The Centers for Disease Control and Prevention (CDC) estimates that unsafe foods cause as many as 76 million illnesses annually. The US Department of Agriculture (USDA) estimates that the costs associated with foodborne illness due to seven pathogens, including *Salmonella*, *Campylobacter*, and *E. coli* O157:H7, range up to \$37 billion annually.

Federal and state expenditures for activities to help ensure the safety of the nation's food

supply are also significant, with federal efforts alone exceeding \$1 billion annually. While there are 12 federal agencies with food safety responsibilities, USDA's Food Safety and Inspection Service (FSIS) and the Department of Health and Human Service's (HHS) Food and Drug Administration (FDA) are the primary federal regulatory agencies responsible for food safety. FSIS is responsible for ensuring that meat, poultry, and processed egg products moving in interstate and foreign commerce are safe, wholesome, and marked, labeled, and packaged correctly. FDA is responsible for ensuring that (1) all foods moving in interstate and foreign commerce, except those under FSIS' jurisdiction, are safe, wholesome, and labeled properly; and (2) all animal drugs and feeds are safe, properly labeled, and produce no human health hazards when used in food-producing animals. In addition, state agencies conduct inspection and regulation activities that help ensure the safety of foods produced, processed, or sold within their borders.

To obtain a better understanding of federal and state food safety efforts, the United States General Accounting Office (GAO) was asked to determine for fiscal years 1998 and 1999 the amount of resources that were expended by FSIS, FDA, and the states for food safety and how the agencies used these resources.

To make this determination for FSIS and FDA, their annual appropriations and financial documentation were analyzed, which included information on actual food safety expenditures, activities and accomplishments. For food safety activities, GAO obtained and reviewed the associated costs and staff year levels and supplemented this information with agency programmatic documents and discussions with agency officials.

To determine the amounts that states expended on food safety and how they used the resources, GAO surveyed the agriculture and health departments of all 50 states, 3 territories, the commonwealths of Puerto Rico and North Mariana Islands, the Federated States of Micronesia, and the District of Columbia. The survey asked respondents for information on the scope of food safety activities their departments performed, the costs and staffing

levels of those activities, and the scope and frequency of inspection activities.

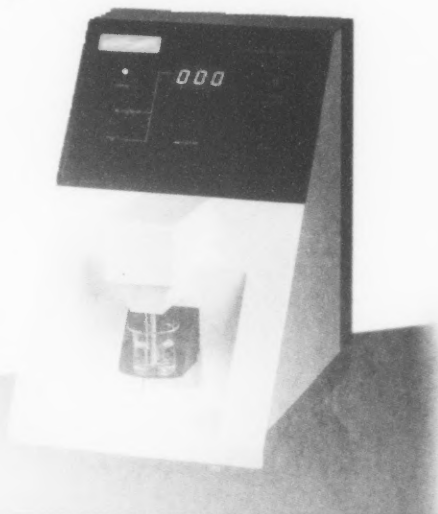
FSIS, FDA, and the state agriculture and health departments expended about \$1.3 billion in fiscal year 1999—FSIS and FDA expended about \$1 billion, and the states reported about \$300 million. The amounts and proportions of food safety expenditures for fiscal year 1998 were similar. Regarding the \$1 billion in fiscal

year 1999 federal moneys, FSIS expended about 70 percent, or \$712 million, overseeing about 20 percent of federally regulated foods and FDA expended about 30 percent, or \$283 million, overseeing about 80 percent of federally regulated foods. These expenditures reflect the regulatory approaches or inspection frequencies contained in the laws under which each agency operates.

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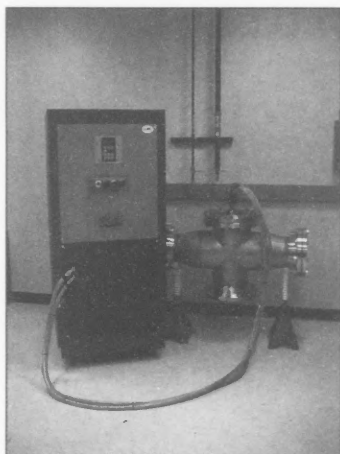
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# Industry Products



Etrema Products Inc.

## New System by Etrema Products Provides Ultrasonic Power

Etrema Products Inc. announces the shipment of the first MaXonics high power continuous duty ultrasonics system. MaXonics 6000 is an entirely new kind of ultrasonics power source that has been introduced, with unprecedented continuous duty power and performance from a commercial system. The system can deliver up to 6000W of power via a specially designed transducer. There is a wide range of industrial applications in the fields of acoustic cavitation and sonochemistry that this system enables. In particular the system has been designed for potential applications in the food processing and pasteurization, municipal water treatment, rubber and plastic recycling, and waste water treatment and remediation. Other applications with the need for high power continuous duty ultrasonic include: powdered metal-liquid processing, enhance

metal refining, molten metals, and many more.

This new technology for ultrasonic power was developed based on findings and experience of an Advanced Technology Program (ATP) cooperative agreement funded jointly by Etrema Products and the National Institute of Science and Technology (NIST). Officials at NIST believe higher power ultrasonic sources resulting from the program will enable a significant increase in ultrasonic industries and jobs.

Etrema Products Inc., Ames, IA

Reader Service No. 271

## Safety Glass Sanitary Luminaire Illuminates Closed Sanitary Vessels from L. J. Star Incorporated

Pressurized tanks, pipelines, mixers and other sanitary vessels are brightly illuminated by the new 3-A approved USL 33 luminaires from L. J. Star Inc. These new compact luminaires mount directly onto virtually any vessel or pipeline and provide 50 watts of intense glare-free light through a Metaglas® safety glass lens. The entire unit measures only 4 inches high.

This new design incorporates the proven MetaClamp™ sanitary mounting system, with its Metaglas safety glass lens, into a flush, compact illumination system that is equally well adapted to illuminating the interior of new or existing sanitary processing equipment.

Metaglas MetaClamp sanitary safety glass lenses are the strongest and most secure glass ele-

ments available. Rupture tests have demonstrated that these mechanically pre-stressed elements tolerate incidental impacts exceptionally well and remain leak-tight at pressures far above the rated design pressures. Not one has ever been known to shatter in service.

Sealed stainless steel construction makes the USL 33 lights dust and water-jet resistant. The halogen bulb life is proven at 2500 hours and an optional on-off pushbutton switch is available. The units are rated for use in all non-hazardous areas in a range of sanitary connection sizes from 1 to 12 inches.

L. J. Star Incorporated,  
Twinsburg, OH

Reader Service No. 272

## Spraying System Co.'s Line of Motor-driven Tank Washers Performs High-impact Cleaning of Tanks

For effective and powerful cleaning of tank interiors, Spraying Systems Co. offers an extensive line of motor-driven tank washers. The AA190 and AA290 Series of tank washers efficiently produce high-impact solid stream sprays for maximum surface cleaning.

The AA190 Tank Washer is ideal for cleaning medium to large tanks up to 34' (10.4 m) in diameter. Available with a variable speed air, electric, or explosion-proof motor, the tank washer's spray head fits through a 3.75" (95 mm) diameter tank opening. The unit uses high-impact solid stream spray tips to achieve maximum cleaning performance with minimal liquid consumption.

*The publishers do not warrant, either expressly or by implication, the factual accuracy of the products or descriptions herein, nor do they so warrant any views or opinions offered by the manufacturer of said articles and products.*

Lightweight and portable, the AA190 Tank Washer weighs just under 16 lbs. (7 kg). It is constructed of corrosion-resistant materials, including 316 stainless steel with Teflon® fluoro-polymer resin seals. Offered with 3', 4', or 6' (0.9, 1.2, or 1.8 m) shafts and a 1 NPT or BSPT inlet connection. Flow rates range from 3.1 to 44.5 gpm (12 to 168 l/min).

The larger capacity Model AA290 Tank Washer effectively cleans tanks up to 40' (12.2 m) in diameter. It can be easily customized to meet specific application requirements. For example, flow rates can be changed through nozzle selection, by adjusting liquid inlet pressure, or by changing motor speed to regulate the speed of the turret.

Available with an air or explosion-proof electric motor, the AA290 Tank Washer is constructed of corrosion-resistant materials, including 316 stainless steel and Teflon fluoro-polymer resin seals. Offered with 3', 4', or 6' (0.9, 1.2, or 1.8 m) shafts and a 2" NPT or BSPT inlet connection. Flow rates range from 22 to 250 gpm (85 to 930 l/min).

Spraying Systems Co.,  
Wheaton, IL

Reader Service No. 273

### Silliker Introduces New Safety Video for Lab Personnel

"GLP Basics: Safety in the Food Micro Lab," the new training video from Silliker Laboratories, teaches laboratory personnel how to prevent workplace hazards.

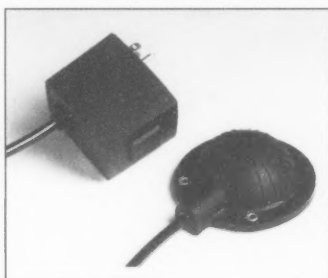
Despite technological advances in the modern food microbiology lab, hazards can occur anytime without warning. How prepared is your staff to handle emergencies? The effec-

tiveness of their training can have lasting consequences on them and your business.

The video covers common and sometimes dangerous laboratory hazards and provides guidelines on how to prevent personal injuries, avoid equipment damage, and protect your facility. Topics covered in this comprehensive video include: General laboratory rules; Personal protective equipment; Microbiological, chemical, and physical hazards; Autoclave safety; and Spill containment.

Silliker Laboratories Group,  
Inc., Homewood, IL

Reader Service No. 274



Pres:Air:Trol Corp.

### Electric Converter Box from Pres:Air:Trol Corp.

This Pres:Air:Trol converter box is used to convert electrical equipment or machinery to a device controlled by a shockproof, waterproof, explosion-proof air button or foot pedal. Just plug the piece of machinery or equipment into our receptacle box which, in turn, plugs into a standard electrical receptacle.

When the Pres:Air:Trol Foot Pedals are depressed, they send an air pulse through tubing to an air switch. The air switch may be momentary, alternate action (latching) or sequencing and is available up to 25 amps, 1HP @ 125vac, 2 HP @ 250vac. The air switch is generally located in the equipment to be connected.

Because the Foot Pedal and their air tubes contain no electrical contacts or current, they are shockproof for the operator and are not affected by water, dirt, flammable gas or dust, making the units ideal in operating rooms, medical and dental equipment, as well as industrial or food processing equipment located in wet or hazardous areas. Having no electrical cables allows the tubing to pass through areas that would be sensitive to electrical or electromagnetic signals given off by electrical cables.

Pres:Air:Trol Corp.,  
Mamaroneck, NY

Reader Service No. 275

### Conveyor Take-up Features Quick Release Operation from Matrix Automation Group, Inc.

A new take-up for sanitary conveyors that features an easy-to-use release mechanism which eliminates the need for manual bolt disassembly and readjustment of belt tracking for routine cleaning and maintenance is introduced.

The Matrix Conveyor Take-up TU-640 permits easy access for cleaning and maintaining the belt and eliminates the need for manual bolt disassembly and the readjustment of belt tracking. Featuring robust all stainless steel construction, this quick release take-up module slackens the belt and returns it to the proper tension setting with the flip of a lever.

Suitable for installation to bolt-on or welded conveyor systems, the modular Matrix Conveyor Take-up TU-640 accommodates virtually all types of standard mounted bearings. Designed for use with pulley or

sprocket-driven conveyor systems, it provides 6" of movement (slack) and 4" of tensioning adjustment. No lubrication or maintenance is necessary.

Matrix Automation Group, Inc., N. Billerica, MA

Reader Service No. 276

### Atkins Temptec Receives Patent for Abrasion-proof Thermocouple Cable

Atkins recently procured a patent for the Abrasion Resistant High Temperature, Flexible Thermocouple Cable. The new design provides a strong, yet flexible link between the thermocouple sensor and the hand-held thermometer, and has been deemed foodsafe by the FDA.

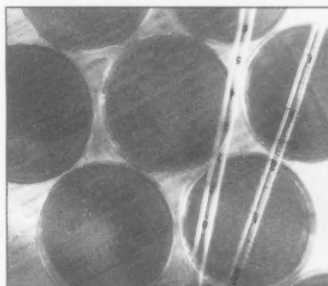
The cable is extremely durable, able to withstand temperatures of up to 400°F and inadvertent slices from knives or other sharp kitchen equipment. A nickel-plated copper or stainless steel shield prevents the outer insulation from stretching, providing a defense against repeated flexure and allowing the cable to undergo repeated cycles of twisting and extension without damage to the inner circuitry. It is designed to be immune to a wide array of potential application hazards, without compromising the accuracy or reliability of the thermocouple wires inside.

The patented cable can be dropped into a boiling fry vat or onto a hot griddle without being damaged. It can be submerged in water, as well as endure the numerous scrapes and nicks that occur with standard use. What makes the cable particularly patent-worthy is its flexibility; even with all other advantages, the cable can still bend at acute angles and absorb the tension

rendered by everyday operation. It also has a small diameter and is lightweight, enabling the user to concentrate on gathering temperatures without having to fuss over the cable or worry about erroneous readouts caused by damage.

Atkins, Gainesville, FL

Reader Service No. 277



Hardy Diagnostics

### API Testing Programs from Hardy Diagnostics

Hardy Diagnostics offers the American Proficiency Institute (API) Testing Programs. Proficiency Testing is an external quality control to measure your laboratory's accuracy. Three times per year "blind" samples are sent to the food laboratories. The samples, whose expected results are unknown to the laboratory, are tested and the results returned to API. The results are compared to other laboratories using the same testing methods and an evaluation of performance is issued to the submitting laboratory. API programs feature samples, a written evaluation of laboratory performance, and strict confidentiality. The Microbiology Proficiency Test Program offers three options: Qualitative Test Methods for determining presence or absence of organisms; Quantitative Test Methods for enumeration techniques, and

HACCP verification methods. The Chemistry Proficiency Test Program is available for chemical analysis related to nutritional labeling. The chemistry analytes are ash, cholesterol, dietary fiber, total fat, protein, sugars, and vitamins. The samples are available in three matrixes.

Hardy Diagnostics, Santa Maria, CA

Reader Service No. 278

### Aeromix Adds a Low Surface Aerator into Its Line of Aeration and Mixing Products

Aeromix has introduced the Twister Low Speed Surface Aerator into its line of cost effective and durable aeration and mixing equipment. Aeromix now offers seven major aeration devices for wastewater treatment and five aeration devices for water treatment.

The Twister can be customized for your particular system. It can be configured to be either floating or fixed mounted, can range from 3 to 150 horsepower (2.2 to 110 kW), and can be either 50 or 60 hertz. It uses a partially submerged rotating turbine to effectively stir the basin while creating intense air-to-water mixing, resulting in a high oxygen transfer. To help reduce maintenance, the fiberglass-reinforced polyester (FRP) rotor is specially shaped to shed debris and prevent ice build-up, and all shafts, couplings, gearboxes and support apparatus's are oversized. Effective applications include wastewater treatment, leachate treatment, supplemental aeration, and sequencing batch reactors (SBRs).

Aeromix Systems, Incorporated, Minneapolis, MN

Reader Service No. 279



## COMMITTEE MEETINGS

Sunday, August 5, 2001

### Hilton Minneapolis

Minneapolis, Minnesota

**7:00 A.M. — 10:00 A.M.**

Affiliate Council

**10:00 A.M. — 5:00 P.M.**

Communicable Diseases Affecting Man

**10:00 A.M. — 12:00 P.M.**

3-A Committee on Sanitary Procedures  
Food Safety Network  
Foundation Fund  
JFP Management  
Microbial Risk Analysis  
Retail Food Safety and Quality  
Viral and Parasitic Foodborne Disease

**12:00 P.M. — 1:30 P.M.**

Student

**1:00 P.M. — 3:00 P.M.**

Applied Laboratory Methods  
Dairy Quality and Safety  
Food Sanitation  
Fruit and Vegetable Safety and Quality  
Meat and Poultry Safety and Quality  
Seafood Safety and Quality

**2:00 P.M. — 4:00 P.M.**

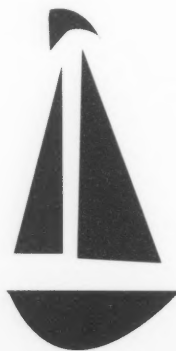
DFES Management

**3:00 P.M. — 5:00 P.M.**

Audiovisual Library  
Awards  
Constitution and Bylaws  
HACCP Task Force  
Nominating  
Past Presidents'

**4:00 P.M. — 5:00 P.M.**

Program





# COMMITTEE CHAIRPERSONS

## Professional Development Groups, Task Forces, and Support Groups

### STANDING COMMITTEES

#### **Dairy, Food and Environmental Sanitation Management Committee**

Linda J. Harris  
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#### **Journal of Food Protection Management Committee**

Donald E. Conner  
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#### **Program Committee**

J. Stan Bailey  
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### SPECIAL COMMITTEES

#### **3-A Committee on Sanitary Procedures**

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#### **Audiovisual Library Committee**

John H. Christy  
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#### **Awards Committee**

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#### **Committee on Communicable Diseases Affecting Man**

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#### **Constitution and Bylaws Committee**

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#### **Foundation Fund Committee**

Harry Haverland  
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#### **Nominating Committee**

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#### **Past Presidents' Committee**

Gale Prince  
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#### **Tellers Committee**

Judy Fraser-Heaps  
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Professional Development Group**

Ann Marie McNamara  
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Professional Development Group**

Donald W. Schaffner  
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Professional Development Group**

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**Seafood Safety and Quality  
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**SUPPORT GROUPS**

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# *Congratulations!*

In April 2001, the International Association for Food Protection exhibited at the Food Safety Summit Expo in Washington, D.C. While exhibiting, we offered a drawing for a one-year Membership with our Association. We are pleased to announce the following winner of the drawing:

**Don Karas**  
Wolfgang Puck Casual Dining  
Boca Raton, FL

# *Ivan Parkin Lecture*

Sunday Evening — August 5, 2001  
7:00 p.m.

**Dr. Linda A. Detwiler**

Senior Staff Veterinarian  
USDA/APHIS, Veterinary Services  
Robbinsville, New Jersey

## *Bovine Spongiform Encephalopathy: An Update*

**D**r. Linda A. Detwiler will present the Ivan Parkin Lecture titled "Bovine Spongiform Encephalopathy: An Update" at the Sunday Evening Opening Session of IAFP 2001 — the Association's 88th Annual Meeting.

Dr. Detwiler is the Senior Staff Veterinarian with the United States Department of Agriculture (USDA) in Robbinsville, New Jersey. She works in the Animal and Plant Health Inspection Service (APHIS) Veterinary Services, Emergency Program where she coordinates APHIS surveillance, prevention and education activities for Bovine Spongiform Encephalopathy (BSE). Dr. Detwiler provides technical advice on Transmissible Spongiform Encephalopathies (TSEs) for USDA, the public, industry groups, foreign governments, and other entities. She acts as media spokesperson for APHIS activities in regards to TSEs in national and international arenas. In addition, Dr. Detwiler serves on national and international TSE advisory committees and coordinated the development of a national BSE response plan. She has authored publications, articles, and decision memos on TSEs.

Dr. Detwiler obtained her BS degree in Dairy Science at the Delaware Valley College of Science and Agriculture and completed her DVM at Ohio State University College of Veterinary Medicine. She previously held positions as the Veterinary Medical Officer for Ohio, the Assistant Veterinarian in Charge for the New England States, the Veterinarian in Charge for New Jersey and currently is the Senior Staff Veterinarian for Small Ruminants with USDA. She is an active member and present coordinator of USDA, APHIS' TSE Working Group since 1990. Dr. Detwiler serves on the TSE Advisory Committee / Working Groups to the European Union, Argentina, the United Kingdom and the FDA. She also served on the combined industry / government BSE committee in the early 1990s.

Dr. Detwiler also has been involved with the sheep industry in their efforts to control scrapie since 1985 and served as one of the APHIS representatives on the Scrapie Negotiated Rulemaking Committee.

Be sure to join us for Dr. Detwiler's Lecture, "Bovine Spongiform Encephalopathy: An Update" at the Opening Session, 7:00 p.m. Sunday, August 5, 2001.



August 5-8, 2001

**Hilton Minneapolis**  
 Minneapolis, Minnesota

# Preliminary Program

P - Posters; S - Symposia; T - Technicals

Program subject to change

## SUNDAY EVENING — AUGUST 5, 2001

7:00 p.m. — 8:00 p.m.

### Opening Session

- ◆ Presentation of the International Association for Food Protection Fellows Awards
- ◆ Ivan Parkin Lecture — **Bovine Spongiform Encephalopathy: An Update**, Dr. Linda Detwiler, Senior Staff Veterinarian, USDA/Animal and Plant Health Inspection Service, Robbinsville, New Jersey

*Cheese and Wine Reception will follow in the Exhibit Hall*

## MONDAY MORNING — AUGUST 6, 2001

8:30 a.m. — 12:00 p.m.

### **S01 Moving Beyond HACCP — Risk Management and Food Safety Objectives, Session I**

*(Sponsored by ILSI-NA)*

- 8:30 ◆ Introduction: International Commission on Microbiological Specifications for Foods (ICMSF) Framework for Managing the Safety of Foods — TERRY A. ROBERTS, ICMSF, Reading, UK
- 8:50 ◆ Assessing Risks and Establishing Food Safety Objectives — ROBERT L. BUCHANAN, FDA-CFSAN, Washington, D.C., USA
- 9:20 ◆ On-the-line: Process and Performance Criteria — MARTIN COLE, Food Science Australia, North Ryde, New South Wales, Australia
- 9:50 ◆ Break
- 10:20 ◆ Use and Misuses of Microcriteria for Foods — MICHIEL VAN SCHOTHORST, Nestlé, S.A., Vevey, Switzerland

- 10:50 ◆ Applying ICMSF Processes for Foods — R. BRUCE TOMPKIN, ConAgra Refrigerated Prepared Food, Downers Grove, IL, USA

- 11:20 ◆ Panel Discussion

### **S02 Impact of Water Quality on Food Safety**

*(Sponsored by IAFP Foundation Fund)*

- 8:30 ◆ Safety of Potable Water from Municipal Treatment Plants/Distribution Systems — MARK W. LECHEVALLIER, American Water Works Service Company, Inc., Voorhees, NJ, USA
- 9:00 ◆ The Walkerton Water Disaster: Our Changing Environment Water Advisory: The Walkerton Experience — MURRAY S. MCQUIGGE, Bruce-Grey-Owen Sound Health Unit, Owen Sound, Ontario, Canada
- 9:30 ◆ Food Production and Processing Risks Using Recycled Water — DEAN O. CLIVER, University of California-Davis, Davis, CA, USA
- 10:00 ◆ Break
- 10:30 ◆ Public Health Risks in the Food Industry Associated with Viral Contamination of Potable Water — LEE-ANN JAYKUS, North Carolina State University, Raleigh, NC, USA
- 11:00 ◆ Public Health Risks in the Food Industry Associated with Parasitic Contamination of Potable Water: Outbreaks and Detection — HUW V. SMITH, Scottish Parasite Diagnostic Laboratory, Glasgow, UK
- 11:20 ◆ Public Health Risks in the Food Industry Associated with Parasitic Contamination of Potable Water: Risk Assessment and Control Methods — NIGEL COOK, Central Science Laboratory, York, UK
- 11:45 ◆ Panel Discussion

### S03 Improving Laboratory Quality Assurance in the Real World

- 8:30 ♦ Laboratory QA: Basic Challenges and Issues – RUSSELL FLOWERS, Silliker Laboratories, Homewood, IL, USA
- 9:15 ♦ Industry Perspectives on Lab Quality Assurance – LORALYN LEDENBACH, Kraft Foods Inc., Glenview, IL, USA
- 10:00 ♦ Break
- 10:30 ♦ The Role of Proficiency Testing in Laboratory Quality Assurance – ARLENE FOX, AOAC International, Gaithersburg, MD, USA
- 11:00 ♦ International Perspectives on Laboratory Quality Assurance – MICHAEL BRODSKY, Brodsky Consultants, Thornhill, Ontario, Canada
- 11:30 ♦ Good Laboratory Practices: The Foundation of an Effective Quality Assurance Program – SUZANNE TORTORELLI, Campbell Soup Company, Camden, NJ, USA

### S04 Food Allergens — Current Issues and Concerns

(Sponsored by IAFP Foundation Fund)

- 8:30 ♦ Consumer Issues – ANN MUNOZ-FURLONG, Food Allergy Network, Fairfax, VA, USA
- 9:00 ♦ Analytical Information – Methods and Findings – STEVE TAYLOR, University of Nebraska-Lincoln, Lincoln, NE, USA
- 9:30 ♦ Supplier Issues – KEVIN FARNUM, General Mills, Inc., Minneapolis, MN, USA
- 10:00 ♦ Break
- 10:30 ♦ In-plant Practices – KEVIN FARNUM, General Mills, Inc., Minneapolis, MN, USA
- 11:00 ♦ Regulatory Perspective – KEN FALCI, FDA, Washington, D.C., USA
- 11:30 ♦ Legal Issues and Perspective – MARTIN HAHN, Hozan and Hartson, Washington, D.C., USA

### T01 Meat Microbiology

- 8:30 ♦ Evaluation of Methods for Sampling Rectal  
T1 Colonal Feces, Hides, and Carcasses to Test for Presence of *Escherichia coli* O157:H7 and *Salmonella* spp. – J. R. RANSOM, R. T. Bacon, K. E. Belk, J. N. Sofos, J. A. Scanga, and G. C. Smith, Colorado State University, Fort Collins, CO, USA
- 8:45 ♦ Rapid Detection of *Escherichia coli*  
T2 O157:H7 in Raw Ground Beef via PCR Using a 375 g Sample Composite and Short Enrichment – C. E. Miller, E. R. Richter, and W. M. BARBOUR, Qualicon, Inc., Wilmington, DE, USA

- 9:00 ♦ Towards a Rapid Quantitative Risk Assessment Model of Human Illness: The Example of *Escherichia coli* O157:H7 in Non-intact Beef – JANELL KAUSE, Eric Ebel, Wayne Schlosser, and Kathy Orloski, USDA-FSIS, Washington, D.C., USA  
T3
- 9:15 ♦ Combined Treatments of 2% Lactic Acid (80°C) and Microwaves for the Reduction of Natural Microflora and *Escherichia coli* O157:H7 on Vacuum-packaged Beef Subprimals – BETH A. CROZIER-DODSON, Daniel Y. C. Fung, Jin-Man Kim, and Leslie K. Thompson, Kansas State University, Manhattan, KS, USA  
T4
- 9:30 ♦ Inhibition of *Listeria monocytogenes* on Hot Dogs Using Antimicrobial Whey Protein-based Edible Casings – A. CAGRI, Z. Ustunol, W. N. Osburn, and E. T. Ryser, Michigan State University, East Lansing, MI, USA  
T5
- 9:45 ♦ Effects of Dried Prune Purees on Suppression of Growth of Foodborne Pathogens in Ground Beef – LESLIE K. THOMPSON and Daniel Y. C. Fung, Kansas State University, Manhattan, KS, USA  
T6
- 10:00 ♦ Break
- 10:30 ♦ Application of Potassium Sorbate and Other Antimicrobial Ingredients to Control *Listeria monocytogenes* in Ready-to-eat Meat and Poultry Products – W. PAYTON PRUETT, JR., Robin Kalinowski, and Jennifer Schmelder, ConAgra Refrigerated Prepared Foods, Downers Grove, IL, USA  
T7
- 10:45 ♦ Serotype Tracking of *Salmonella* through Integrated Broiler Chicken Operations – J. S. BAILEY, N. A. Cox, N. J. Stern, and S. E. Craven, USDA-ARS, Athens, GA, USA  
T8
- 11:00 ♦ Microbiological Risk Assessment on Raw Pork Carcasses in Ontario Abattoirs – PAT JOHNSON, Joseph Odumeru, Abdullahi Mahdi, Tom Baker, Christine Power, and Frank Pollari, Ontario Ministry of Agriculture, Food and Rural Affairs, Guelph, Ontario, Canada  
T9
- 11:15 ♦ Evaluations of Acidified Sodium Chlorite for Use on Red Meats – T. Rourke, M. Guerra, G. K. Kemp, B. C. TINSLEY, C. C. Warf, T. G. Richardson, P. L. Baxter, and K. R. Schneider, Alcide Corporation, Redmond, WA, USA  
T10
- 11:30 ♦ Comparative Studies of the Microbial-Vac™, a Non-destructive Wet-vacuum Microbial Collection System on Beef Carcasses – BRUCE J. BRADLEY, Filomena S. Saddler, and Danielle J. Prescott, Rocky Mountain Resource Labs, Inc., Jerome, ID, USA  
T11

- 11:45 ♦ Real Time Detection of Pathogenic *Vibrio*  
T12 *parahaemolyticus* in Oysters – ANGELO  
DEPAOLA, George Blackstone, Jessica  
Jones, Michael Bowen, and Richard Meyer,  
FDA, Dauphin Island, AL, USA
- P01 Produce Microbiology**  
10:00 a.m. – 1:00 p.m.  
(Authors present 10:30 a.m. – 12:30 p.m.)
- P1 ♦ Comparative Study of *Toxoplasma gondii*  
Oocysts on Raspberries and Blueberries –  
K. K. PHELPS, S. S. Sumner, D. S. Lindsay,  
J. P. Dubey, and M. D. Pierson, Virginia  
Tech., Blacksburg, VA, USA
- P2 ♦ Development of a Standard Method to  
Detect *Giardia* on Fresh Fruit and  
Vegetables – NOREEN WILKINSON,  
K. L. Barker, C. A. Paton, R. A. B. Nichols,  
H. V. Smith, and N. Cook, Central Science  
Laboratory, York, N. Yorks, UK
- P3 ♦ Isolation of Potential Microbial  
Competitors of Foodborne Pathogens for  
Use on Fresh and Minimally-processed  
Produce – KAREN M. CRAMP and Mark A.  
Harrison, University of Georgia, Athens,  
GA, USA
- P4 ♦ Consumer Handling of Fresh Produce –  
AMY E. LI and Christine M. Bruhn,  
University of California-Davis, Davis, CA,  
USA
- P5 ♦ Withdrawn
- P6 ♦ Evaluation of Postharvest Survival and  
Growth of *Salmonella*, *Escherichia coli*,  
and *Listeria* on Peaches – R. Cifuentes,  
S. Goerge, A. Hernandez, T. Parnell,  
L. J. Harris, and T. SUSLOW, University  
of California-Davis, Davis, CA, USA
- P7 ♦ *Salmonella* Inactivation from the Surface  
of Whole and Cut Produce by Gaseous  
Ozone – JOSEPH EIFERT, Parameswarar-  
kumar Mallikarjunan, and Fletcher Arritt,  
Virginia Tech., Blacksburg, VA, USA
- P8 ♦ Is *Salmonella enterica* a Good Colonizer  
of Plant Surfaces? – MARIA BRANDL and  
Robert Mandrell, USDA-ARS-WRRC,  
Albany, CA, USA
- P9 ♦ Reducing *Salmonella* on the Surface of  
Apples Using Wash Practices Commonly  
Used by Consumers – TRACY L. PARNELL  
and Linda J. Harris, University of California-  
Davis, Davis, CA, USA
- P10 ♦ Isolation and Characterization of a *Lacto-*  
*bacillus plantarum* Bacteriophage from  
Cucumber Fermentation – ZHONGJING  
LU, Fred Breidt, Jr., and Henry P. Fleming,  
USDA-ARS, Raleigh, NC, USA
- P11 ♦ Effect of Glycine Betaine on Survival of  
*Lactococcus lactis* in Fresh, Refrigerated,  
Spicy Cucumbers – LAURA D. REINA, Fred  
Breidt, Jr., and Henry P. Fleming, USDA-  
ARS, Raleigh, NC, USA
- P12 ♦ Reduction of *Listeria monocytogenes* on  
Green Peppers (*Capsicum annuum*) by  
Gaseous and Aqueous Chlorine Dioxide  
and Water Washing, and Its Growth at  
Refrigerated Temperature – Y. HAN,  
R. H. Linton, P. E. Nelson, and S. S.  
Nielsen, Purdue University, West Lafayette,  
IN, USA
- P13 ♦ Mold and Yeast Flora in Fresh Fruits –  
VALERIE TOURNAS, FDA, Washington,  
D.C., USA
- P14 ♦ Improved Quality and Fumonisin Levels in  
Mexican Corn – H. Calderón, R. Márquez,  
A. Arias, S. D. PENA-BETANCOURT, and  
J. Saltijeral, Universidad Autonoma Metro-  
politana, Mexico City, Distrito Federal,  
Mexico
- P15 ♦ Spread of *Listeria monocytogenes* during  
Preparation of Freshly Squeezed Orange  
Juice – N. E. MARTINEZ-GONZALES,  
A. Hernandez-Herrera, L. Martinez-Chavez,  
L. Mota de la Garza, and A. Castillo,  
University of Guadalajara, Guadalajara,  
Jalisco, Mexico
- P16 ♦ Effects of pH and Temperature on Inact-  
ivation of *Escherichia coli* O157:H7 in a  
Model Apple Cider System – DIANNE R.  
RIPBERGER, Richard H. Linton, and John  
D. Floros, Purdue University, West  
Lafayette, IN, USA
- P17 ♦ A Survey of Production Practices and  
Microbial Contamination in Iowa Apple  
Cider – ALECIA CUMMINS and Bonita  
Glatz, Iowa State University, Ames, IA, USA
- P18 ♦ Elimination of *Escherichia coli* O157:H7 in  
Apple Cider by Electron Beam Irradiation –  
HUI WANG, Cheryll Reitze, and Bonita  
Glatz, Iowa State University, Ames, IA, USA
- P19 ♦ Influence of Temperature on Inactivation  
of *Escherichia coli* O157:H7 and *Salmon-*  
*ella* in Apple Cider and Orange Juice  
Treated with Ozone – R. C. WILLIAMS,  
C. A. Lakins, D. A. Golden, and S. S. Sumner,  
University of Tennessee, Knoxville, TN,  
USA
- P20 ♦ Chemical Inactivation of *Escherichia coli*  
O157:H7 and *Salmonella* spp. in Apple  
Cider and Orange Juice – C. A. LAKINS,  
D. A. Golden, and S. S. Sumner, University  
of Tennessee, Knoxville, TN, USA

- P21 ♦ Survival of *Salmonella* in Calcium-fortified Orange Juice at Refrigeration Temperature – M. SHARMA, L. R. Beuchat, M. P. Doyle, and J. Chen, University of Georgia, Griffin, GA, USA
- P22 ♦ Survival Differences of Enterohemorrhagic *Escherichia coli* O157:H7 Strains in Three Apple Varieties at 25° and 4°C – MARLENE E. JANES, Tajhma Cobbs, and Mike G. Johnson, University of Arkansas, Fayetteville, AR, USA
- P23 ♦ Effect of Low-temperature, High-pressure Treatment on the Survival of *Escherichia coli* O157:H7 and *Salmonella* in Unpasteurized Fruit Juices – Alex Yeow-Lim Teo, SADHANA RAVISHANKAR, and Charles E. Sizer, The National Center for Food Safety and Technology, Summit-Argo, IL, USA
- P24 ♦ Validation of Thermal Pasteurization Treatments for Commercial Apple Ciders Using *Escherichia coli* O157:H7 – P. MAK, S. C. Ingham, and B. H. Ingham, University of Wisconsin-Madison, Madison, WI, USA
- P25 ♦ Inactivation of *Listeria monocytogenes* in Cinnamon-added Apple Juice – Josep Yuste and DANIEL Y. C. FUNG, Kansas State University, Manhattan, KS, USA
- P26 ♦ Transmission and Internalization of *Escherichia coli* O157:H7 from Contaminated Cow Manure into Lettuce Tissue as Monitored by Laser Scanning Confocal Microscopy – ETHAN B. SOLOMON, Sima Yaron, and Karl R. Matthews, Rutgers University, Cook College, New Brunswick, NJ, USA
- P27 ♦ Evaluation of Various Household Sanitizers for Eliminating *Escherichia coli* on Lettuce – CHITRA VIJAYAKUMAR and Charlene Wolf-Hall, North Dakota State University, Fargo, ND, USA
- P28 ♦ Effectiveness of Water Rinse as a Means for Pathogen Recovery in Lettuce – TONG-JEN FU and Olif Vanpelt, FDA, Summit-Argo, IL, USA
- P29 ♦ Simulation of an *Escherichia coli* O157:H7 Lettuce Outbreak in a Restaurant Setting: Survival of *E. coli* O157:H7 on and Contamination of Shredded Lettuce – MARIAN R. WACHTEL and Amy O. Charkowski, USDA-ARS-BARC-W-PQSL, Beltsville, MD, USA
- P30 ♦ Changes in Appearance and Natural Microflora on Iceberg Lettuce Treated in Warm Chlorinated Water and Then Stored at Refrigeration Temperature – Y. LI, R. E. Brackett, R. L. Shewfelt, and L. R. Beuchat, University of Georgia, Griffin, GA, USA
- P31 ♦ Comparison of Commercial Cleaners for Effectiveness in Removing *Salmonella* and *Escherichia coli* O157:H7 from the Surface of Apples – STEPHEN J. KENNEY and Larry R. Beuchat, University of Georgia, Griffin, GA, USA
- P32 ♦ Destruction of *Escherichia coli* O157:H7 on Apples of Different Varieties Treated with Citric Acid before Drying – S. LAKKAKULA, P. A. Kendall, J. Samelis, and J. N. Sofos, Colorado State University, Fort Collins, CO, USA
- P33 ♦ Destruction of *Escherichia coli* O157:H7 during Drying of Apple Slices Pre-treated with Acidic Solutions after Inoculation – E. L. DERRICKSON, P. A. Kendall, and J. N. Sofos, Colorado State University, Fort Collins, CO, USA
- P34 ♦ The Localization and Persistence of Bacterial and Viral Contaminants on the Surface of Inoculated Cantaloupe and Their Response to Disinfection Treatments – MICHAEL L. BRADLEY, Jerzy Lukasik, Mark L. Tamplin, and Samuel R. Farrah, University of Florida, Gainesville, FL, USA
- P35 ♦ Minimum Bacteriostatic and Bactericidal Concentrations of Various Household Sanitizers for *Escherichia coli* – CHITRA VIJAYAKUMAR and Charlene Wolf-Hall, North Dakota State University, Fargo, ND, USA
- P36 ♦ The Bactericidal Effect of Chlorine Dioxide Treatment against *Salmonella* spp., *Escherichia coli* O157:H7, and *Listeria monocytogenes* Inoculated on Tomatoes and Carrots – I-HSUAN CHEN, J. Kim, T. S. Huang, D. E. Conner, S. J. Weese, F. M. Woods, and C. I. Wei, Auburn University, Auburn, AL, USA
- P37 ♦ Enhancement of the Microbiological Quality of Selected Ready-to-eat Vegetables Disinfected by Chloramine, Chlorine, Ethanol, and Ozone – T. T. TRAN, J. I. Uwaleke, R. L. Thunberg, C. R. Warner, and S. J. Chirtel, FDA, Washington, D.C., USA
- P38 ♦ Assessment of the Antibacterial Efficacy of Fruit and Vegetable Washes Using In-vitro and In-situ Methods – CHARLES A. PETTIGREW, Andrea B. Burnett, Larry R. Beuchat, E. Fernandez Escartin, Theresa M. Kajs, Russ D. Poehner, and Charles H. Taylor, The Procter & Gamble Company, Cincinnati, OH, USA

(Monday a.m. continued)

- P39 ♦ Inactivation of Pathogenic Bacteria on Lettuce by Hydrogen Peroxide and Mild Heat – CHIA-MIN LIN, Sarah S. Moon, Kay H. McWatters, and Michael P. Doyle, University of Georgia, Griffin, GA, USA
- P40 ♦ Comparison of Peptone Water and Dey-Engley Neutralizing Broth in Recovering Bacteria from the Surface of Fresh Produce Treated with Lactic Acid and Hydrogen Peroxide – CHIA-MIN LIN, Hannalore Bailey, Sarah S. Moon, and Michael P. Doyle, University of Georgia, Griffin, GA, USA
- P41 ♦ Evaluation of Volatile Chemical Treatments for Lethality to *Salmonella* on Seeds and Sprouts – W. R. Weisinger, K. H. McWatters, and L. R. BEUCHAT, University of Georgia, Griffin, GA, USA

## MONDAY AFTERNOON — AUGUST 6, 2001

1:30 p.m. — 5:00 p.m.

### S05 Moving Beyond HACCP — Risk Management and Food Safety Objectives, Session II

(Sponsored by ILSI-N.A.)

- 1:30 ♦ What are Food Safety Objectives and How do They Relate to Public Health Objectives? – R. BRUCE TOMPKIN, ConAgra Refrigerated Prepared Food, Downers Grove, IL, USA
- 2:00 ♦ What Role Should Food Safety Objectives Play in the United States Food Industry and How Will They Affect the Way Industry Does HACCP? – DON L. ZINK, Future Beef Operations, LLC, Thousand Oaks, CA, USA
- 2:30 ♦ What Role Should Food Safety Objectives Play in the Regulatory Process? – ROBERT L. BUCHANAN, FDA-CFSAN, Washington, D.C., USA
- 3:00 ♦ Break
- 3:30 ♦ An International Perspective on Food Safety Objectives – STEVE C. HATHAWAY, MAF Food Assurance Authority, Gisborne, New Zealand
- 4:00 ♦ How Can We Educate the Public about Tolerable Level of Risk/Acceptable Level of Protection? – SUSAN SANTOS, Focus Group, Medford, MA, USA
- 4:30 ♦ Panel Discussion

### S06 USDA Competitive Grants in Food Safety and the Awards Process

- 1:30 ♦ Enhancing Food Safety and Epidemiological Approaches to Food Safety (NR1) – ETTA SALTOS, USDA-CSREES, Washington, D.C., USA
- 2:00 ♦ National Integrated Food Safety Initiative Grants (406) – JAN SINGLETON, USDA-CSREES, Washington, D.C., USA
- 2:30 ♦ Initiative for Future Agriculture and Food Systems (401), RFP Formulation and Stakeholder's Input – DAMANNA RAMKISHAN RAO, USDA-CSREES, Washington, D.C., USA
- 3:00 ♦ Break
- 3:30 ♦ Awards Process: A Panel Manager's Perspective – SUSAN S. SUMNER, Virginia Tech., Blacksburg, VA, USA
- 4:00 ♦ Winning Integrated Proposals: A Winner's Perspective – PATRICIA A. KENDALL, Colorado State University, Fort Collins, CO, USA
- 4:30 ♦ Panel Discussion

### S07 Food Safety in the Digital Age

- 1:30 ♦ From Data to Knowledge Management – KAREN MULLERY, 3M Microbiology, St. Paul, MN, USA
- 1:40 ♦ New and Emerging Information Technologies – JOHN GRIGGS, GSC Mobile Solutions, East Lansing, MI, USA
- 2:00 ♦ From EpiInfo to FoodNet: Improving Surveillance and Outbreak Response – ARTHUR P. LIANG, CDC, Atlanta, GA, USA
- 2:30 ♦ Meeting Regulatory Requirements for Electronic Record Keeping and Electronic Signatures (21 CFR 11) – JOHN LARKIN, FDA, Summit-Argo, IL, USA
- 3:00 ♦ Break
- 3:30 ♦ Emerging Technologies to Map and Mitigate Biocontaminants – RICK BRENNER, USDA-ARS-CMAVE, Gainesville, FL, USA
- 4:00 ♦ Using Information Technology to Make Better Business Decisions – MARK CARTER, McKee Foods, Collegedale, TN, USA
- 4:30 ♦ Kraft Takes a Byte Out of Food Safety – LORI LEDENBACH, Kraft Foods, Glenview, IL, USA



## S08 Dairy Plant HACCP — Where are We and Where are We Going?

(Sponsored by Foss North America)

- 1:30 ♦ Outline of HACCP Pilot Program — WILLIAM SVEUM, Kraft Foods, Madison, WI, USA
- 2:00 ♦ Evaluation of Pilot at Present and Long-term Goals — SUSAN CRAWFORD, Michigan Dept. of Agriculture, East Lansing, MI, USA
- 2:45 ♦ Overview of HACCP Pilot Results — JOHN RUSHING, North Carolina State University, Raleigh, NC, USA
- 3:15 ♦ Break
- 3:30 ♦ First Hand HACCP Pilot Experience — REBECCA PISTON, Gerelick Farms, Bangor, ME, USA
- 4:00 ♦ What Happens to PMO with HACCP (SSOP's and HACCP Pilot) — STEVE SIMS, FDA, Milk Safety Branch, Washington, D.C., USA
- 4:30 ♦ FDA Juice HACCP Regulations Versus NCIMS Dairy Pilot Program — KATHY GOMBAS, FDA, Division of HACCP, Washington, D.C., USA

## T02 General Food Microbiology

- 1:30 ♦ A Microbial Survey of Toilet Paper and Associated Performance Variables Related to Its Role in Reducing Communicable Disease Transmission — BARRY MICHAELS, Marlene Celis, Troy Ayers, and Vidhya Gangar, Georgia-Pacific Corporation, Palatka, FL, USA
- 1:45 ♦ Evaluation of the Combined Effects of Selective Handwashing Water Temperatures and Antimicrobial Soaps on Microbial Reduction Efficacy and Skin Irritation — BARRY MICHAELS, James Budd, Troy Ayers, Christopher Beausoliel, and Daryl Paulson, Georgia-Pacific Corporation, Palatka, FL, USA
- 2:00 ♦ Application of Real Time Temperature Monitoring for Food Safety and Quality Management in Food Retail — ALAN CAMERICK HELLER, Bruce Cords, and Meto Raha, FreshLoc Technologies, Inc., Plano, TX, USA
- 2:15 ♦ A Microbial Survey of Household Can Openers, Food and Beverage Can Tops, and Cleaning Methodology Effectiveness — Barry Michaels, Vidhya Gangar, Ann Schultz, Michael S. Curiale, and TROY AYERS, Ayers Hygiene Consulting, Gainesville, FL, USA
- 2:30 ♦ Inhibitory Activity of Honey against Food-borne Pathogens as Influenced by the Presence of Hydrogen Peroxide and Level of Antioxidant Power — PETER J. TAORMINA, Brendan A. Niemira, and Larry R. Beuchat, University of Georgia, Griffin, GA, USA
- 2:45 ♦ Sensitization of Gram-negative Bacteria for Antimicrobial Peptides under High Hydrostatic Pressure: Role of Cell Surface Characteristics — BARBARA MASSCHALCK and Christiaan W. Michiels, Catholic University of Leuven, Leuven, Belgium
- 3:00 ♦ Break
- 3:30 ♦ Protective Effect of Colanic Acid of *Escherichia coli* O157:H7 to Environmental Stress — Y. Mao, S. M. Lee, J. G. Adams, M. P. Doyle, and J. CHEN, University of Georgia, Griffin, GA, USA
- 3:45 ♦ Bactericidal Activity of Oleate Towards Vegetative Cells and Endospores of *Clostridium perfringens* — ARTHUR HINTON, JR. and Kimberly D. Ingram, USDA-RR, Athens, GA, USA
- 4:00 ♦ Validating Sanitation Regimes in Drink Vending and Post-mix Systems — J. BARON, L. F. Fielding, and A. Peters, University of Wales Institute, Cardiff, Cardiff, UK
- 4:15 ♦ Providing Safe Food for the Homeless and Destitute: An Educational Program for Soup Kitchen Workers — DONNA L. SCOTT and Robert B. Gravani, Cornell University, Ithaca, NY, USA
- 4:30 ♦ Microbiological Survey of Hot-air Hand Dryers from Various Locations — BARRY MICHAELS, Armondo D'Onorio, Maria Arenas, Marlene Cellis, and Vidhya Gangar, Georgia-Pacific Corporation, Palatka, FL, USA
- 4:45 ♦ Pathogenic and Indicator Bacteria Associated with Handwashing and Drying Contact Surfaces — BARRY MICHAELS, Brian Smith, and Merle Pierson, Georgia-Pacific Corporation, Palatka, FL, USA

## P02 Meat Microbiology

3:00 p.m. — 6:00 p.m.

(Authors present 3:30 p.m. — 5:30 p.m.)

- P42 ♦ Inhibition of *Listeria monocytogenes* on Turkey Frankfurters by Carbon Dioxide and Chemical Additives — J. A. GOODE, M. D. Pierson, S. S. Sumner, and J. E. Marcy, Virginia Tech., Blacksburg, VA, USA

(Monday p.m. continued)

- P43 ♦ Inhibition of *Listeria monocytogenes* by Sodium Diacetate and Sodium Lactate on Wieners and Cooked Bratwurst – KATHLEEN A. GLASS, Dawn A. Granberg, Angelique L. Smith, and Eric A. Johnson, University of Wisconsin-Madison, Madison, WI, USA
- P44 ♦ Radiation Resistance of *Listeria monocytogenes* Isolated from Frankfurters – CHRISTOPHER H. SOMMERS, USDA-ARS-NAA-ERRC-FS, Wyndmoor, PA, USA
- P45 ♦ Control of *Listeria monocytogenes* on Turkey Frankfurters by GRAS Preservatives – MAHBUB ISLAM, Michael P. Doyle, Jinru Chen, and Manjeet Chinnan, University of Georgia, Griffin, GA, USA
- P46 ♦ Effect of Antimicrobials in the Formulation and Post-packaging Thermal Pasteurization on *Listeria monocytogenes* Inoculated on Frankfurters after Peeling – G. BEDIE, J. Samelis, J. N. Sofos, K. E. Belk, J. A. Scanga, and G. C. Smith, Colorado State University, Fort Collins, CO, USA
- P47 ♦ Treatments to Control Post-processing Contamination by *Listeria monocytogenes* on Sliced Pork Bologna Stored at 4°C in Vacuum Packages – M. L. Kain, J. Samelis, J. N. SOFOS, K. E. Belk, J. A. Scanga, and G. C. Smith, Colorado State University, Fort Collins, CO, USA
- P48 ♦ Combinations of Nisin with Organic Acids or Salts to Control Post-processing Contamination of *Listeria monocytogenes* on Sliced, Vacuum Packaged Pork Bologna at 4°C – J. SAMELIS, M. L. Kain, J. N. Sofos, J. A. Scanga, K. E. Belk, and G. C. Smith, Colorado State University, Fort Collins, CO, USA
- P49 ♦ Fate of Acid-adapted and Non-adapted *Listeria monocytogenes* on Fresh Beef Following Acid and Non-acid Decontamination Treatments – J. S. IKEDA, J. Samelis, P. A. Kendall, G. C. Smith, and J. N. Sofos, Colorado State University, Fort Collins, CO, USA
- P50 ♦ Lactic Acid Sensitization of *Salmonella* Typhimurium DT 104 and *Listeria monocytogenes* in Non-acid (Water) Meat Decontamination Fluids at 10°C – J. SAMELIS, J. N. Sofos, P. A. Kendall, and G. C. Smith, Colorado State University, Fort Collins, CO, USA
- P51 ♦ Biofilm Formation by Acid-adapted and Non-adapted *Listeria monocytogenes* in Fresh Meat Decontamination Washings and Its Destruction by Sanitizers – J. D. STROPFORTH, J. Samelis, J. N. Sofos, P. A. Kendall, G. C. Smith, Colorado State University, Fort Collins, CO, USA
- P52 ♦ Inactivation of *Listeria monocytogenes* in Packaged Hot Dogs and Luncheon Meats by High Pressure Processing (HPP) – P. J. Slade, C. Martino, S. Ravishankar, N. MAKS, C. Rodriguez, O. Martin, and V. M. (Bala) Balasubramaniam, Illinois Institute of Technology, Summit-Argo, IL, USA
- P53 ♦ Survival of *Salmonella* spp. and *Listeria monocytogenes* during Manufacture of Italian Salami – K. D. KERR, H. Thippareddi, R. K. Phebus, J. L. Marsden, and C. L. Kastner, Kansas State University, Manhattan, KS, USA
- P54 ♦ *Salmonella* spp. Risk Assessment for Production and Cooking of Non-intact Pork Products – D.L. LAMBERT, R. K. Phebus, H. Thippareddi, J. L. Marsden, and C. L. Kastner, Kansas State University, Manhattan, KS, USA
- P55 ♦ Biofilm Development by *Listeria monocytogenes* under Ready-to-eat Meat Processing Conditions and a Control Strategy Using Cold Plasma Technology – EILEEN B. SOMERS and Amy C. L. Wong, University of Wisconsin-Madison, Madison, WI, USA
- P56 ♦ Enhanced Inhibition of *Listeria monocytogenes* and *Salmonella enterica* Serovar Enteritidis in Beef Bologna by Combinations of Lactate and Diacetate – EVELYNE MBANDI and Leora A. Shelef, Wayne State University, Detroit, MI, USA
- P57 ♦ Survival and Recovery of *Listeria monocytogenes* on Ready-to-eat Meats Inoculated Using Desiccated and Nutritionally Depleted Vectors – M. A. DE ROIN, S. C. C. Foong, and J. S. Dickson, Iowa State University, Ames, IA, USA
- P58 ♦ Post-process Pasteurization of Packaged Ham, Roast Beef, and Turkey Breast Surfaces to Reduce *Listeria monocytogenes* – VINEET S. GILL, H. Thippareddi, R. K. Phebus, J. L. Marsden, and C. L. Kastner, Kansas State University, Manhattan, KS, USA

- P59 ♦ Post-process Pasteurization of Kielbasa (Full and Half) and Salami to Reduce Surface *Listeria monocytogenes* – VINEET S. GILL, H. Thippareddi, R. K. Phebus, J. L. Marsden, and C. L. Kastner, Kansas State University, Manhattan, KS, USA
- P60 ♦ Inhibition of *Listeria monocytogenes* by Sodium Diacetate and Potassium Lactate in Cured, Ready-to-eat Processed Meat Products at Refrigerated Temperatures – D. L. Seman, A. C. BORGER, J. D. Meyer, A. L. Milkowski, and P. A. Hall, Kraft Foods/Oscar Mayer Div., Madison, WI, USA
- P61 ♦ Application of the Bacteriocinogenic *Lactobacillus sake* 2a to Prevent Growth of *Listeria monocytogenes* in Brazilian Sausage (Lingüiça Frescal) Packed with Different Atmospheres – Alcina M. Liserre and BERNADETTE D. G. FRANCO, Universidade de Sao Paulo, São Paulo, São Paulo, Brazil
- P62 ♦ The Presence of *Campylobacter* and *Salmonella* in Retail Poultry and Packaging – WENDY HARRISON, Chris Griffith, David Tennant, and Adrian Peters, University of Wales Institute, Cardiff, Cardiff, Wales, UK
- P63 ♦ PCR-based Fluorescent Method for Rapid Detection of *Campylobacter jejuni* and *Salmonella* Typhimurium in Poultry Samples – HONG WANG, Yanbin Li, Michael Slavik, and Jianming Ye, University of Arkansas, Fayetteville, AR, USA
- P64 ♦ Determination of Critical Control Points (CCPs) at Poultry Slaughterhouses in Korea – WONKI BAE, Ji Yeon Kim, Keun Seok Seo, Hye Cheong Koo, Soo Jin Yang, So Hyun Kim, Nam Hoon Kwon, Ji Yeun Lim, and Yong Ho Park, Seoul National University, Suwon, Republic of Korea
- P65 ♦ Antimicrobial Effect of Electrolyzed Water for Inactivating *Campylobacter jejuni* during Poultry Washing – HOON PARK, Yen-Con Hung, and Robert E. Brackett, University of Georgia, Griffin, GA, USA
- P66 ♦ Mucosal Humoral Immunity to Experimental *Salmonella* Enteritidis Infection in Chickens – K. H. SEO, P. S. Holt, H. D. Stone, C. Green, and R. K. Gast, USDA-ARS, Southeast Poultry Research Laboratory, Athens, GA, USA
- P67 ♦ Bacterial Survival, Moisture Content, and Soluble Proteins in Chicken Patties Processed by an Air Impingement Oven – R. Y. MURPHY, L. K. Duncan, E. R. Johnson, and M. D. Davis, University of Arkansas, Fayetteville, AR, USA
- P68 ♦ Kinetic Parameters for Thermal Inactivation of *Salmonella* spp. in Commercially Formulated Chicken Patties and Franks – R. Y. MURPHY, E. R. Johnson, and M. D. Davis, University of Arkansas, Fayetteville, AR, USA
- P69 ♦ Incidence of *Clostridium perfringens* in an Integrated Broiler Chicken Operation from Breeder Farm to the Fully-processed Product – S. E. CRAVEN, N. A. Cox, N. J. Stern, and J. S. Bailey, USDA-ARS-RRR, Athens, GA, USA
- P70 ♦ *Clostridium perfringens* Levels in Cooked and Uncooked Meat and Poultry Products – ROBIN M. KALINOWSKI, Peter Bodnaruk, and R. Bruce Tompkin, ConAgra Refrigerated Prepared Foods, Downers Grove, IL, USA
- P71 ♦ Evaluation of the MicroFoss System for Enumeration of Total Viable Organisms, *Escherichia coli*, and Coliforms in Ground Beef – JOSEPH ODUMERU and Jennifer Belvedere, University of Guelph, Guelph, Ontario, Canada
- P72 ♦ Gel Peroxygens as Barrier and Treatment Systems for Beef Carcasses – Charles J. Giambrone and CRYSTAL J. NESBITT, FMC Corp., Princeton, NJ, USA
- P73 ♦ Comparison of Methods for the Isolation of *Escherichia coli* O157:H7 from Ground Beef – WENDY LEEPER, Ann Schultz, Katie Vandre, Carol Gravens, Ronald Johnson, and Pat Rule, Silliker Laboratories Research, South Holland, IL, USA
- P74 ♦ *Escherichia coli* O157:H7 Risk Assessment for the Production and Cooking of Restructured Beef Steaks – M.T. ORTEGA-VALENZUELA, R. K. Phebus, H. Thippareddi, J. L. Marsden, and C.L. Kastner, Kansas State University, Manhattan, KS, USA
- P75 ♦ *Escherichia coli* O157:H7 Maintains Acid Tolerance in Acid-containing but not in Nonacid-containing Fresh Meat Decontamination Waste Fluids – J. SAMELIS, J. N. Sofos, P. A. Kendall, and G. C. Smith, Colorado State University, Fort Collins, CO, USA

(Monday p.m. continued)

- P76 ♦ Food Safety: Consumer Views of Public Versus Private Interventions Related to Meat Processing – Christiane Schroeter, KAREN P. PENNER, and Sean Fox, Kansas State University, Manhattan, KS, USA
- P77 ♦ The Incidence of *Salmonella* spp. and Biotype 1 *Escherichia coli* on Swine Carcasses Processed under the HACCP-based Inspection Models Project – MARK L. TAMPLIN, Ingrid Feder, Samuel A. Palumbo, Alan Oser, Lisa Yoder, and John B. Luchansky, USDA-ARS-ERRC, Wyndmoor, PA, USA
- P78 ♦ Vero Cell Assay for Detection of Cytoplasmic Vacuolation by *Arcobacter* spp. Isolated from Meat – A. Villarruel-Lopez, L. Garay-Martinez, R. Torres-Vitela, E. CABRERA-DIAZ, E. Murano, and L. Mota de la Garza, Universidad de Guadalajara, Guadalajara, Jalisco, Mexico
- P79 ♦ Validation and Use of Alkaline Phosphatase Reduction as an Indicator for Meat Cooking Efficiency – E. C. REDMOND, C. J. Griffith, and A. C. Peters, University of Wales Institute, Cardiff, Cardiff, South Wales, UK
- P80 ♦ Isolation of Shiga Toxin-producing *Escherichia coli* in Cattle Manure after a Passive Treatment – E. CABRERA-DIAZ, M. Marquez-Gonzalez, F. Sandoval-Garcia, H. M. Zepeda-Lopez, and M. R. Torres-Vitela, University of Guadalajara, Guadalajara, Jalisco, Mexico
- P81 ♦ Survival of *Escherichia coli* O157:H7 in Cow Manure-amended Soil – X. P. JIANG, J. M. Morgan, and M. P. Doyle, University of Georgia, Griffin, GA, USA
- P82 ♦ Seasonal Occurrence of *Campylobacter* in Dairy Cattle and Their Environment – WILLIE TAYLOR, Ann Draughon, David Golden, Stephen Oliver, and Michelle Saul, University of Tennessee, Knoxville, TN, USA
- P83 ♦ Sampling of the Dairy Farm Environment for *Listeria monocytogenes* – VALERIE W. LING, Matthew R. Evans, F. Ann Draughon, and Stephen P. Oliver, University of Tennessee, Knoxville, TN, USA
- P84 ♦ Comparison of Multiplex, ELISA and 5' Nuclease PCR Assays for Detection of Plasmid-bearing Virulent *Yersinia enterocolitica* in Pig Feces – SAUMYA BHADURI and Bryan Cottrell, USDA-ARS-ERRC, Wyndmoor, PA, USA

**TUESDAY MORNING — AUGUST 7, 2001**

**8:30 a.m. — 12:00 p.m.**

**S09 Joint FAO/WHO Initiative on Microbial Risk Assessment**

(Sponsored by IAFP Foundation Fund)

- 8:30 ♦ Overview of the FAO/WHO Process – JORGEN SCHLUNDT, WHO, Food Safety Program, Geneva, Switzerland
- 8:45 ♦ Exposure Assessment of *Salmonella* spp. in Broilers – LOUISE KELLY, Veterinary Laboratories Agency, Weybridge, Surrey, UK
- 9:10 ♦ Exposure Assessment of *Salmonella* Enteritidis in Eggs – FUMIKO KUSUGA, National Institute of Infectious Diseases, Shinjuku-Ku, Tokyo, Japan
- 9:35 ♦ Hazard and Risk Characterization of *Salmonella* – AAMIR FAZIL, Health Canada, Guelph, Ontario, Canada
- 10:00 ♦ Break
- 10:30 ♦ Exposure Assessment of *Listeria monocytogenes* in Ready-to-eat Meat and Fish – TOM ROSS, University of Tasmania, Hobart, Tasmania, Australia
- 10:55 ♦ Exposure Assessment of *Listeria monocytogenes* in Dairy Products – EWEN TODD, Michigan State University, East Lansing, MI, USA
- 11:20 ♦ Hazard and Risk Characterization of *Listeria monocytogenes* – ROBERT L. BUCHANAN, FDA-CFSAN, Washington, D.C., USA
- 11:45 ♦ Panel discussion

**S10 Organic Foods: Unique Characteristics and Growth Potential**

(Sponsored by IAFP Foundation Fund)

- 8:30 ♦ The Unique Characteristics of Organic Production – JIM RIDDLE, Organic Inspection Association, Winona, MN, USA
- 9:00 ♦ What Organic Means in the Produce Industry – CRAIG WEAKLEY, Small Planet Foods, Sedro Woolley, WA, USA
- 9:30 ♦ Organic Dairy Products, Production and Quality Characteristics – PAM RIESGRAF, Organic Valley, Jordan, MN, USA
- 10:00 ♦ Break
- 10:30 ♦ Chemical Safety Issues in Organic Production – CARL WINTER, University of California-Davis, Davis, CA, USA

- 11:00 ♦ Microbiological Safety Issues in Organic Production – MICHAEL P. DOYLE, University of Georgia, Griffin, GA, USA
- 11:30 ♦ International Organic Market: Standards and Potential – DIANE BOWEN, Crop Improvement Association, International, Milwaukee, WI, USA

### S11 Indicator Microorganisms — What do They Indicate, and is It of Any Use?

- 8:30 ♦ Practical Applications of Indicator Organisms in Poultry Processing – MIKE ROBACH, Wayne Farms LLC, Gainesville, GA, USA
- 9:00 ♦ Use of Indicator Organism Testing in the Food Industry: Rationale and Examples – ANN MARIE MCNAMARA, Sara Lee Foods, Cordova, TN, USA
- 9:30 ♦ FDA and Indicator Organisms: Which, Where, and Why? – ROBERT E. BRACKETT, FDA, Washington, D.C., USA
- 10:00 ♦ Break
- 10:30 ♦ The New Zealand National Microbiological Database HACCP Verification Program – ROGER COOK, Ministry of Agriculture and Forestry, Wellington, New Zealand
- 11:00 ♦ Is There a Relationship between Microbial and Non-microbial Indicators of Fecal Contamination and Fecal Bacteria – GREG SIRAGUSA, USDA-ARS-RRC, Athens, GA, USA
- 11:30 ♦ How Much is That Sample in the Window? Application of Value-of-information Techniques to Evaluate and Compare Sampling Strategies – GREG PAOLI, Decisionalysis Risk Consultants, Inc., Ottawa, Ontario, Canada

### S12 Ensuring the Quality and Safety of Extended Shelf-Life Milk Products

- 8:30 ♦ The Essentials of Extended Shelf-Life (ESL) Processing – CHUCK SIZER, National Center for Food Safety and Technology, Summit-Argo, IL, USA
- 9:00 ♦ Validation and Monitoring of ESL Packaging Systems – JEAN DELISI, Tetra Rex, Inc., Minneapolis, MN, USA
- 9:30 ♦ Quality Assurance of ESL Products – From Plant to Consumer – ROGER HOOL, Dean Foods, Rockford, IL, USA
- 10:00 ♦ Break

- 10:30 ♦ Regulatory Perspective of ESL Processing and Products – JOSEPH SMUCKER, FDA, Washington, D.C., USA

- 11:00 ♦ Overview of NCFST's ESL Dairy Products Task Force – PETER J. SLADE, National Center for Food Safety and Technology, Summit-Argo, IL, USA
- 11:30 ♦ International Perspective of ESL Processing and Products – CHUCK SIZER, National Center for Food Safety and Technology, Summit-Argo, IL, USA

### T03 Microbiological Methods

- 8:30 ♦ An Improved Transport Medium for the Preservation and Recovery of *Listeria monocytogenes* in Plant Environmental Samples – MICHAEL C. CIRIGLIANO and Raymond T. McKenna, Lipton, Cresskill, NJ, USA
- 8:45 ♦ Comparison of a New ELISA-based Method and a Molecular Method for the Detection of *Listeria monocytogenes* in Food – PATRICE ARBAULT, Marie-Laure Sorin, Pascal Faraut, and Arnaud Carlotti, Diffchamb S.A., Lyon, France
- 9:00 ♦ Evaluation of a Next-day PCR Method for Detection of *Listeria monocytogenes* in Foods – George Tice, W. MARK BARBOUR, Willie Hudson, Bridgette Andaloro, and Angeline Stoltzfus, Qualicon, Inc., Wilmington, DE, USA
- 9:15 ♦ *Campylobacter* Detection in Food Using Tan ELISA-based Method – Marie-Laure Sorin, Sandrine Rougier, Cécile Wicker, Magali Giordano, and PATRICE ARBAULT, Diffchamb S.A., Lyon, France
- 9:30 ♦ A Comparison of the Survival Rates of *Campylobacter jejuni* under Varying Organic Loads and Food Contact Surfaces – Alessandra De Cesare and BRIAN W. SHELDON, North Carolina State University, Raleigh, NC, USA
- 9:45 ♦ Comparison of Polymerase Chain Reaction Primer Sets Designed to Detect *Salmonella* Enterica – AMY O. CHARKOWSKI, Eric S. Jackson, Jeri Barak, Robert E. Mandrell, and Michael Delwiche, USDA-ARS, Albany, CA, USA
- 10:00 ♦ Break
- 10:30 ♦ Factors That Influence the Recovery of *Escherichia coli* O157:H7 after an Acid Shock – Yildiz Karaibrahimoglu and FRANCISCO DIEZ-GONZALEZ, University of Minnesota, St. Paul, MN, USA

- 10:45 ♦ Development of a Digital Database of  
T32 Lactic Acid Bacteria in Europe – Maija-Liisa  
Suihko, Erko Stackebrandt, Bruno Pot,  
Martine Alliot, Timothy R. Dambaugh,  
JAMES L. BRUCE, and Annick Mercenier,  
Qualicon, Inc., Wilmington, DE, USA
- 11:00 ♦ The Risks of Using Data Loggers to Monitor  
T33 Average Temperature Exposures – JOHN  
A. SPEVACEK, Ph.D, 3M Microbiology  
Products, St. Paul, MN, USA
- 11:15 ♦ An Evaluation of Surface Hygiene  
T34 Monitoring Techniques for Use in the Food  
Industry – GINNY MOORE, Chris Griffith,  
and Louise Fielding, University of Wales  
Institute, Cardiff, Cardiff, UK
- 11:30 ♦ Detection of Hepatitis A Virus in a  
T35 Complex Food: Strawberry Frosting Mix –  
THERESA L. CROMEANS, Mark D. Sobsey,  
and Harold S. Margolis, CDC, Atlanta, GA,  
USA
- 11:45 ♦ Development of PCR Primers for Detection  
T36 of Prolific Histamine Former, *Morganella*  
*morganii* – SHIN-HEE KIM, Haejung An,  
Cheng-I Wei, and Thomas P. Pitta, Auburn  
University, Auburn, AL, USA
- P03 General Food Microbiology and Methods**  
10:00 a.m. – 1:00 p.m.  
(Authors present 10:30 a.m. – 12:30 p.m.)
- P85 ♦ Antimicrobial Spectrum of Thymol,  
Eugenol, Potassium Sorbate and Sodium  
Benzoate at Selected pHs – R. Astorga-  
Solari, A. Santiesteban-López, E. Palou,  
and A. LOPEZ-MALO, Universidad de  
las Americas-Puebla, Cholula, Puebla,  
Mexico
- P86 ♦ Rope Spoilage in Bread and Its Control by  
Natural Antimicrobials – Tracey-Lee Botes  
and ALEX VON HOLY, University of the  
Witwatersrand, Johannesburg, South Africa
- P87 ♦ Antimycotic Activity of Vanillin in  
Combination with Selected Antimicrobial  
Agents – A. LOPEZ-MALO, S. M. Alzamora,  
and E. Palou, Universidad de las Américas-  
Puebla, Cholula, Puebla, Mexico
- P88 ♦ Reduction of Aflatoxins by Korean  
Soybean Paste and Its Effect on  
Cytotoxicity and Reproductive Toxicity:  
Antigenotoxic Effect of the Methanol  
Extract of Korean Soybean Paste on  
Aflatoxin B1-induced Bacterial Reverse  
Mutation and Chromosome Aberration –  
KIM JONG-GYU, Lee Yong-Wook, and  
Shintani Hideharu, Keimyung University,  
Dalseo-gu, Taegu, Korea
- P89 ♦ Performance of Mycological Media for  
Supporting Colony Formation by  
Desiccated Food Spoilage Yeasts: An  
Inter-laboratory Study – L. R. BEUCHAT,  
E. Frandberg, T. Deak, S. M. Alzamora,  
J. Chen, S. Guerrero, A. Lopez-Malo,  
I. Ohlsson, M. Olsen, J. M. Pienado,  
J. Schnurer, M. I. de Siloniz, and  
J. Tornai-Lehoczhi, University of Georgia,  
Griffin, GA, USA
- P90 ♦ SimPlate for Yeast and Mold – Color  
Indicator: A New Method for Rapid  
Enumeration of Fungi in Food – DAVID  
E. TOWNSEND, Linda Mui, Drew Lienau,  
Stephanie Leung, Donna Gallagher, and  
Phil Feldsine, BioControl Systems, Inc.,  
Bellevue, WA, USA
- P91 ♦ Detection of Antifungal Activity of  
*Lactobacillus rhamnosus* and *Bacillus*  
*pumilus* Using a Milk Agar Plate Assay –  
JITKA STILES, Shilpa Penkar, Milada  
Plockova, Jana Chumchalova, and Lloyd  
B. Bullerman, University of Nebraska-  
Lincoln, Lincoln, NE, USA
- P92 ♦ Reduction of Aflatoxins by Korean  
Soybean Paste and Its Effect on  
Cytotoxicity and Reproductive Toxicity:  
Inhibitory Effect of Korean Soybean Paste  
on the Aflatoxin Toxicity in Laying Hens –  
JONG-GYU KIM, Yong-Wook Lee, Pan-Gyi  
Kim, Woo-Sup Roh and Hideharu Shintani,  
Keimyung University, Dalseo-gu, Taegu,  
Korea
- P93 ♦ *Aspergillus flavus* Radial Growth Rate  
and Lag Time as Affected by Natural and  
Synthetic Antimicrobial Agent Concen-  
trations – A. López-Malo, E. Palou, and S. M.  
ALZAMORA, Universidad de Buenos Aires,  
Capital Federal, Buenos Aires, Argentina
- P94 ♦ Hurdle Technology and *Aspergillus flavus*  
Time-to-growth – A. López-Malo, E. PALOU,  
S. M. Alzamora, and P. M. Davidson,  
Universidad de las Americas-Puebla,  
Cholula, Puebla, Mexico
- P95 ♦ Survival and Growth of *Salmonella* in  
Reconstituted Infant Cereal Hydrated  
with Water, Milk, or Apple Juice –  
A. A. ABUSHELAIBI, J. Samelis, P. A. Kendall,  
and J. N. Sofos, Colorado State University,  
Fort Collins, CO, USA
- P96 ♦ Evaluation of Liquid Egg White Pasteuri-  
zation Guidelines for *Salmonella* –  
DIANNE L. PETERS, Glenn W. Froning,  
and Mindy M. Brashears, University of  
Nebraska-Lincoln, Lincoln, NE, USA

- P97 ♦ New Easy-to-read, Quantitative Method for *Escherichia coli* Testing in Foods – KAREN HESSELROTH, Francoise Horriere, Barbara Horter, and Katheryn Lindberg, 3M Microbiology Products Department, St. Paul, MN, USA
- P98 ♦ Inhibitory Activity of *Bifidobacterium longum* HY8001 against Verocytotoxin of *Escherichia coli* O157:H7 – S. H. KIM, S. J. Yang, H. C. Koo, W. K. Bae, J. Y. Kim, J. H. Park, Y. J. Back, and Y. H. Park, Seoul National University, Suwon, Republic of Korea
- P99 ♦ Effect of Glucose Supplementation on Growth and Acid Tolerance of *Escherichia coli* O157:H7 in Pure and Mixed Cultures with a *Pseudomonas* spp. at 10°C – J. SAMELIS, J. N. Sofos, J. S. Ikeda, P. A. Kendall, and G. C. Smith, Colorado State University, Fort Collins, CO, USA
- P100 ♦ Influence of Process Parameters on the Lethality of *Escherichia coli* O157:H7 during Pulsed Electric Fields Processing – K. THANT, V. M. Balasubramaniam, and S. Ravishankar, Illinois Institute of Technology, Summit-Argo, IL, USA
- P101 ♦ Detex for Detection of *Escherichia coli* O157 in Raw Ground Beef and Raw Ground Poultry – Wendy F. Lauer, Nandini Natrajan, and YVETTE M. HENRY, Molecular Circuitry, Inc, King of Prussia, PA, USA
- P102 ♦ Resuscitation and Growth of Heat- and Freeze-injured *Escherichia coli* O157:H7 in Selective Enrichment Broths – LAWRENCE RESTAINO, Elon W. Frampton, and Hans Spitz, R & F Laboratories, West Chicago, IL, USA
- P103 ♦ Changes in Thermal Sensitivity Resulting from pH and Nutritional Shifts of Acid-adapted and Non-acid-adapted *Listeria monocytogenes* Scott A, a Serotype 4b Strain – DARRELL O. BAYLES and Stacy R. Raleigh, USDA-ARS-ERRC, Wyndmoor, PA, USA
- P104 ♦ Comparison of Predictive Models for a 4-log Thermal Reduction of *Listeria monocytogenes* when Growth Conditions Differed – A. T. Chhabra, R. H. Linton, W. H. Carter, and M. A. COUSIN, Purdue University, West Lafayette, IN, USA
- P105 ♦ Thermal Inactivation Studies of *Listeria monocytogenes* Strains Belonging to Three Distinct Genotypic Lineages – A. J. DE JESUS and R. C. Whiting, FDA-CFSAN, Washington, D.C., USA
- P106 ♦ Cycloheximide Replacement in Campy-line Agar for *Campylobacter* Enumeration – J. ERIC LINE, USDA-ARS-RRC, Athens, GA, USA
- P107 ♦ Detex for the Detection of *Campylobacter* in Raw and Cooked Poultry – YVETTE M. HENRY, Wendy F. Lauer, and Sharon L. Brunelle, Molecular Circuitry Inc., King of Prussia, PA, USA
- P108 ♦ Survival and Thermotolerance of *Campylobacter jejuni* in Liquid Foods: Effects of Temperature and Presence of *Escherichia coli* and *Pseudomonas fluorescens* – ORLA M. CLOAK and Pina M. Fratamico, USDA-ARS-ERRC, Wyndmoor, PA, USA
- P109 ♦ Effectiveness of Selected Chemical Sanitizers against *Campylobacter jejuni* Containing Biofilms – NATHANON TRACHOO and Joseph F. Frank, University of Georgia, Athens, GA, USA
- P110 ♦ Heat Shock Enhances Acid Tolerance of *Shigella flexneri* – GLORIA L. TETTEH and Larry R. Beuchat, University of Georgia, Griffin, GA, USA
- P111 ♦ Effect of Organic Acids and Temperature on Survival of *Shigella flexneri* in Broth – LAURA L. ZAIKA, USDA-ARS-ERRC, Wyndmoor, PA, USA
- P112 ♦ Response of Food Spoilage *Bacillus* spp. to Three Acid-based Sanitizers – M. Esther Peta, Denise Lindsay, Volker S. Brozel, and ALEX VON HOLY, University of the Witwatersrand, Johannesburg, South Africa
- P113 ♦ Presence of Toxigenic *Bacillus* in Cup Drinks from Automatic Vending Machines on the Street – JONG-HYUN PARK, J. Y. Shin, S. J. Lee, Y. A. Kwon, and C. Mok, Kyungwon University, Songnam-shi, Kyonggi-Do, Republic of Korea
- P114 ♦ Monte Carlo Simulation of the Influence of Spore Inoculum Size on *Clostridium botulinum* Germination and Growth – LIHUI ZHAO, Thomas J. Montville, and Donald W. Schaffner, Rutgers University, New Brunswick, NJ, USA
- P115 ♦ Estimation of Bacterial Cell Counts in Foods Using an Oxygen Electrode Sensor – YOSHIHISA AMANO, Junichiro Arai, Shunsuke Yamanaka, Kenji Isshiki, Daikin Environmental Laboratory, Ltd., Tsukubashi, Ibaraki, Japan

[Tuesday a.m. continued]

- P116 ♦ Rapid Detection of *Listeria monocytogenes* without DNA Extraction from Foods Using Polymerase Chain Reaction – D. H. OH, S. Y. Cho, Y. C. Choi, and B. K. Park, Kangwon National University, Chunchon, Kangwon, Korea
- P117 ♦ PCR Detection of *Listeria monocytogenes* on Hot Dog Using Oligonucleotide Primers Targeting the Genes Encoding Internalin AB – Y. S. JUNG, J. F. Frank, R. E. Brackett, and J. Chen, University of Georgia, Griffin, GA, USA
- P118 ♦ Inactivation of Hepatitis A Virus by a Dynamic High Pressure Treatment – JULIE JEAN, Jean-François Vachon, André Darveau, and Ismaïl Fliss, Laval University, Quebec, Quebec, Canada
- P119 ♦ Handwashing Practices in United Kingdom Nursing Homes – DEBORAH CLAYTON, Christopher Griffith, Adrian Peters, and Patricia Price, University of Wales Institute, Cardiff, Cardiff, South Wales, UK
- P120 ♦ Assessment and Variability of Cleaning Practices of United Kingdom Consumers, Using Observation, ATP, and Microbiological Assessment – E. C. REDMOND, C. J. Griffith, and A. C. Peters, University of Wales Institute, Cardiff, Cardiff, South Wales, UK
- P121 ♦ Kansas Food\*A\*Syst: Self-assessment Tools for Determining Risks to Food Safety during Production and Home Preparation – JUDY M. WILLINGHAM and Karen P. Penner, Kansas State University, Manhattan, KS, USA
- P122 ♦ Effect of Ozonated Water on the Assimilable Organic Carbon and Coliform Growth Response Values and on Pathogenic Bacteria Survival – KATHLEEN T. RAJKOWSKI and Eugene Rice, USDA-ARS-ERRC, Wyndmoor, PA, USA
- P123 ♦ Adaptative Acid Tolerance Response in *Vibrio parahaemolyticus* and *V. vulnificus* – JAHEON KOO and Michael Jahncke, Virginia Seafood Agricultural Research and Extension Center, Hampton, VA, USA
- P124 ♦ Thermotolerance of Coagulase-negative *Staphylococci* and Their Potential Use as Indicators of Cheese Plant Sanitation – KOLE A. EWOLDT and Steven C. Ingham, University of Wisconsin-Madison, Madison, WI, USA

- P125 ♦ Protecting the United States Food Supply in a Global Economy: An Expert Gap Analysis – PAUL A. HALL, La Salle University, Mundelein, IL, USA

## TUESDAY AFTERNOON — AUGUST 7, 2001

1:30 p.m. — 5:00 p.m.

### General Session — (1:30 p.m. — 3:30 p.m.)

#### S13 Irradiation Pasteurization: Realizing the Food Safety Potential

(Sponsored by IAFP Foundation Fund)

- 1:30 ♦ Potential Impact of Irradiation on Reducing Foodborne Illness in the United States – ROB TAUXE, CDC, Atlanta, GA, USA
- 1:50 ♦ Safety, Nutritional Adequacy and the Status of Irradiated Foods: International Perspective – FRITZ KAUFSTEIN, FDA-USDA, Washington, D.C., USA
- 2:10 ♦ Food Irradiation – The Clear and Simple Facts – PAT ADAMS, IBA Advanced Applications, Memphis, TN, USA
- 2:25 ♦ Expanding Consumers Food Safety Choices – The Minnesota Experience – ROD CHURCH, Minnesota Dept. of Health, Minneapolis, MN, USA
- 2:40 ♦ Putting Irradiated Food on Supermarket Shelves – Experiences of a Leader in the Retail Industry – MICHAEL WRIGHT, Supervalu and Cub Food Stores, Minneapolis, MN, USA
- 3:00 ♦ Legal Issues with Foods in General and Irradiated Food Specifically – WILLIAM MARLER, Marler Clark Attorneys at Law, Seattle, WA, USA

### Business Meeting (4:00 p.m. — 5:00 p.m.)

## WEDNESDAY MORNING — AUGUST 8, 2001

8:30 a.m. — 12:00 p.m.

#### S14 *Mycobacterium paratuberculosis* — Villain or Bystander?

(Sponsored by ILSN.A.)

- 8:30 ♦ The Evidence for and against the Association of *Mycobacterium paratuberculosis* with Human Crohn's Disease – R. BALFOUR SARTOR, University of North Carolina, Chapel Hill, NC, USA
- 9:00 ♦ The Etiology of Bovine Paratuberculosis and On-farm Management Strategies – SCOTT J. WELLS, University of Minnesota, St. Paul, MN, USA



- 9:30 ♦ Ecological and Physical Characteristics of *Mycobacterium paratuberculosis* – MICHAEL COLLINS, University of Wisconsin-Madison, Madison, WI, USA
- 10:00 ♦ Break
- 10:30 ♦ Methodology for Detecting *Mycobacterium paratuberculosis* in Food Products – JUDITH R. STABEL, USDA-ARS, Ames, IA, USA
- 11:00 ♦ Detection of *Mycobacterium paratuberculosis* in Retail Milk in the United Kingdom: Analysis and Perspectives – NORMAN A. SIMMONS, Guy's and St. Thomas' Hospital Trust, London, UK
- 11:30 ♦ Panel Discussion

### **S15 Zero Tolerance: Boon or Bust?**

- 8:30 ♦ An Overview of Zero Tolerance as a Regulatory Policy – LYNN MCMULLEN, University of Alberta, Edmonton, Alberta, Canada
- 8:50 ♦ An Industry View of Zero Tolerance – DANE BERNARD, Keystone Foods, Bala Cynwyd, PA, USA
- 9:10 ♦ Applications and Problems Associated with Zero Tolerance for *Escherichia coli* O157:H7 in Beef Products – DEAN DANIELSON, IBP World Headquarters, Dakota Dunes, SD, USA
- 9:35 ♦ Public Health and Regulatory Perspectives on Zero Tolerance – I. KAYE WACHSMUTH, USDA-FSIS, Washington, D.C., USA
- 10:00 ♦ Break
- 10:30 ♦ A Canadian Perspective on Zero Tolerance – JEFF FARBER, Health Canada, Ottawa, Ontario, Canada
- 11:00 ♦ An International Perspective on Zero Tolerance – PAUL TEUFEL, Institute for Hygiene and Food Safety, Kiel, Germany
- 11:30 ♦ A Consumer Perspective on Benefits and Application – CAROLINE SMITH-DEWAAL, Center for Science in the Public Interest, Washington, D.C., USA

### **S16 Communicating Science Effectively**

*(Sponsored by IAFP Foundation Fund)*

- 8:30 ♦ Listening, the First Step in Effective Communication to the Public – CHRISTINE M. BRUHN, University of California-Davis, Davis, CA, USA
- 9:00 ♦ How to Communicate Food Science to Produce Grant Dollars – SUSAN S. SUMNER, Virginia Tech., Blacksburg, VA, USA

- 9:30 ♦ The Role of the Trade Association in Effectively Communicating "Understandable" Science to Consumers – RHONA S. APPLEBAUM, National Food Processors Association, Washington, D.C., USA

- 10:00 ♦ Break
- 10:30 ♦ Communicating with the Public: Making a Hard Sell a Success – NANCY PETERSON, Kansas State University, Manhattan, KS, USA
- 11:00 ♦ Communicating Hot Topics: Consumer and Producer Response to Genetically Engineered and Conventional Sweetcorn and Potatoes – DOUG POWELL, University of Guelph, Guelph, Ontario, Canada
- 11:30 ♦ Panel Discussion

### **S17 Educating Food Service Workers**

- 8:30 ♦ Social Marketing: A Strategy for Effective Food Service Education – CLARA LAWHEAD, Pasco Co. Health Dept., New Port Richey, FL, USA
- 9:00 ♦ FDA Retail Food Program Database of Foodborne Illness Risk Factors (August 2000) – Suggested Interventions for Dealing with the Three Risk Factors in Need of Great Attention – RICHARD BARNES, FDA, Rockville, MD, USA
- 9:30 ♦ The Power of Partnering – ANGELA FRASER, North Carolina State University, Raleigh, NC, USA
- 10:00 ♦ Break
- 10:30 ♦ Training in the Quick Service Environment – LISA WRIGHT, Foodmaker, Inc., San Diego, CA, USA
- 11:00 ♦ Keeping It Upbeat! A University of South Florida Food Safety Workshop Based on Fight BAC™! – ROY COSTA, Sanitary Environmental Monitoring Labs, (Semco Labs) Deerfield Beach, FL, USA
- 11:30 ♦ The Teachable Moment – Training Temporary Event Paid and Volunteer Foodservice Workers – MARTHA SMITH PATNOAD, University of Rhode Island, Kingston, RI, USA

### **T04 Produce Microbiology**

- 8:30 T37 ♦ Food Safety Begins on the Farm: A National Education and Extension Program for Growers and Packers – Elizabeth A. Bihn and ROBERT B. GRAVANI, Cornell University, Ithaca, NY, USA

- 8:45 ♦ Efficacy of Disinfection Methods against  
T38 Caliciviruses on Fresh Fruits, Vegetables,  
and Food-contact Surfaces – B. R. GULATI,  
P. B. Allwood, C. W. Hedberg, and S. M.  
Goyal, University of Minnesota, St. Paul,  
MN, USA
- 9:00 ♦ Concentration and Detection of Viruses  
T39 from Fresh Produce and Food-contact  
Surfaces – A. K. TAKU, B. R. Gulati, P. B.  
Allwood, C. W. Hedberg, and S. M. Goyal,  
University of Minnesota, St. Paul, MN, USA
- 9:15 ♦ Inactivation of *Cryptosporidium parvum*  
T40 in Apple Cider Using Ultraviolet Light –  
N. BASARAN, J. Churey, and R. W.  
Worobo, Cornell University, Geneva, NY,  
USA
- 9:30 ♦ Effects of Hydrogen Peroxide on the  
T41 Survival of *Cryptosporidium parvum*  
Oocysts in Unpasteurized Fruit Juices –  
K. K. PHELPS, D. S. Lindsay, R. Fayer,  
D. A. Golden, and S. S. Sumner, Virginia  
Tech., Blacksburg, VA, USA
- 9:45 ♦ Inactivation of *Escherichia coli* O157:H7  
T42 and *Salmonella* in Apple Cider and Orange  
Juice by Combination Treatments of  
Ozone and Chemical Preservatives – R. C.  
WILLIAMS, D. A. Golden, and S. S. Sumner,  
University of Tennessee, Knoxville, TN,  
USA
- 10:00 ♦ Break
- 10:30 ♦ Hydrogen Peroxide and Organic Acids as  
T43 Antimicrobials in Fruit Juices – J. SCHURMAN,  
S. S. Sumner, D. A. Golden, M. D. Pierson,  
J. D. Eifert, and J. E. Marcy, Virginia Tech.,  
Blacksburg, VA, USA
- 10:45 ♦ Growth of *Listeria monocytogenes* and  
T44 *Escherichia coli* O157:H7 is Enhanced in  
Ready-to-eat Lettuce Washed in Warm  
Water – P. J. DELAQUIS, P. M. Toivonen,  
and S. Stewart, AAFC, Pacific Agri-Food  
Research Centre, Summerland, British  
Columbia, Canada
- 11:00 ♦ Application of Vapor Heat to the Exocarp  
T45 of Cantaloupe for the Reduction of  
*Salmonella* and *Escherichia coli* Prior to  
Minimal Processing – TREVOR SUSLOW  
and Marcella Zúñiga, University of  
California-Davis, Davis, CA, USA
- 11:15 ♦ Effect of Hot Water and Heated Hydrogen  
T46 Peroxide Treatments in Reducing Transfer  
of *Salmonella* and *Escherichia coli* from  
Cantaloupe Surfaces to Fresh-cut Tissues –  
D. O. UKUKU, V. Pilizota, G. M. Sapers,  
and P. H. Cooke, USDA-ARS-ERRC,  
Wyndmoor, PA, USA
- 11:30 ♦ Lethality of 5 MeV e-Beam to *Staphylococ-*  
T47 *cus Salmonella* and *Listeria* in Sliced Cant-  
aloupe and Tomato – ANN DRAUGHON,  
Amelia Evans, Greg Hulbert, and John  
Mount, University of Tennessee, Knoxville,  
TN, USA
- 11:45 ♦ Isolation, Identification, and Selection of  
T48 Lactic Acid Bacteria from Alfalfa Sprouts  
for Competitive Inhibition of Foodborne  
Pathogens – M. R. HARRIS, M. M. Brashears,  
and D. Smith, University of Nebraska-  
Lincoln, Lincoln, NE, USA

**P04 Meat, Dairy, and General Food  
Microbiology**

10:00 a.m. – 1:00 p.m.

(Authors present 10:30 a.m. – 12:30 p.m.)

- P126 ♦ Dairy-associated *Bacillus cereus* Growing  
as a Biofilm Has a Distinct Proteome –  
Marinda Oosthuizen, Bridgitta Steyn,  
Volker Brözel, Denise Lindsay, and ALEX  
VON HOLY, University of the  
Witwatersrand, Johannesburg, South Africa
- P127 ♦ Growth of *Bacillus cereus* and *Pseudo-*  
*monas fluorescens* Binary Biofilms and  
Response to a Chlorine Dioxide-containing  
Sanitizer in a Model Flow System – Denise  
Lindsay, Volker Brözel, and ALEX VON  
HOLY, University of the Witwatersrand,  
Johannesburg, South Africa
- P128 ♦ Heat Inactivation of *Listeria* Biofilm –  
R. CHMIELEWSKI and J. Frank, University  
of Georgia, Athens, GA, USA
- P129 ♦ Microbial Growth in Transgenic Pork –  
P. C. NEDOLUHA, M. B. Solomon,  
V. G. Pursel, and A. D. Mitchell, USDA-ARS,  
Beltsville, MD, USA
- P130 ♦ Recovery of Injured *Yersinia entero-*  
*colitica* from Swine Production Sites –  
MINA SHEHEE and Mark Sobsey, University  
of North Carolina, Chapel Hill, NC, USA
- P131 ♦ Microbiological and Sensory Quality of  
New York State Fluid Milk Products: 1990-  
1999 – NANCY R. CAREY, Kathryn W.  
Chapman, Shirley M. Kozlowski, Steven  
C. Murphy, David K. Bandler, and Kathryn  
J. Boor, Cornell University, Ithaca, NY,  
USA
- P132 ♦ Survival of *Listeria monocytogenes* in  
Refrigerated, Nisin-treated, Skim, 2%, and  
Whole Milk during Storage at 5°C –  
APAMA VEERAMACHANENI and Leora A.  
Shelef, Wayne State University, Detroit, MI,  
USA

- P133 ♦ Effect of Residual Sanitizers on Cultured Dairy Products – TIMOTHY HARRIED, Chr. Hansen, Inc., Milwaukee, WI, USA
- P134 ♦ The Effect of Osmotic Stress Adaptation on Heat Resistance of *Listeria monocytogenes* Scott A in Pork Slurry – MAKUBA A. LIHONO, Aubrey F. Mendonca, and Edward E. Fetzner, Iowa State University, Ames, IA, USA
- P135 ♦ Inhibition of Pathogens on Process Cheese Slices at Abuse Temperature – KATHLEEN A. GLASS, Dawn A. Granberg, Ann E. Larson, and Eric A. Johnson, University of Wisconsin-Madison, Madison, WI, USA
- P136 ♦ Recovery of *Salmonella* from Dairy Cattle and Their Environment – PHILIPUS PANGLOLI, Ann Draughon, Stephen Oliver, David Golden, and Yobouet Dje, University of Tennessee, Knoxville, TN, USA
- P137 ♦ *Escherichia coli* O157:H7 in Dairy Cows and Their Environment – PHILIPUS PANGLOLI, Ann Draughon, Stephen Oliver, David Golden, and Yobouet Dje, University of Tennessee, Knoxville, TN, USA
- P138 ♦ GIS and Epidemiology of *Salmonella* on Dairy Farms – KIMBERLY D. LAMAR, F. Ann Draughon, Philipus Pangloli, Stephen P. Oliver, and David Golden, University of Tennessee, Knoxville, TN, USA
- P139 ♦ Assessment of *Salmonella*, *Listeria* and *Escherichia coli* O157 in Biosolids and Streams Associated with a Dairy Farm – TERESA ERVIN, Ron Yoder, Ann Draughon, Robert Burns, and Raj. Raman, University of Tennessee, Knoxville, TN, USA
- P140 ♦ Microbial Safety of Pasture Versus Free-range Chickens Using Organic and Traditional Feed – TRISH WELCH, Jeannette Endres, and Bill Banz, Southern Illinois University, Carbondale, IL, USA
- P141 ♦ Survival of Fecal Indicator Bacteria in Bovine Manure Incorporated into Soil – MARIA M. LAU and Steven C. Ingham, University of Wisconsin-Madison, Madison, WI, USA
- P142 ♦ A Rapid Method for the Detection of *Listeria* in the Dairy Factory Environment – JILL GEBLER and Sharon Savory, Murray Goulburn Co-op Co. Ltd., Yarram, Victoria, Australia
- P143 ♦ Rapid Detection of Microorganisms in Dairy Products Using an Automated Optical System – RUTH FIRSTENBERG-EDEN, Debra L. Foti, and Susan T. McDougal, BioSys Inc., Ann Arbor, MI, USA
- P144 ♦ Dead *Listeria monocytogenes* Cells are Detected in Cooked Meat and Smoked Fish with a Commercial PCR-based Kit – ARNAUD CARLOTTI, Pascal Faraut, Marie-Laure Sorin, and Patrice Arbault, IDmyk S.A., Limonest, France
- P145 ♦ Assessment of Protein Fingerprinting Method for Species Verification of Meats – J. A. ODUMERU, J. Siwik, K. Lee, M. Marcone, and R. Robinson, University of Guelph, Guelph, Ontario, Canada
- P146 ♦ Validation of CCPs in HACCP Systems in Small Meat and Poultry Processing Plants in Nebraska – JASON E. MANN, Mindy M. Brashears, Dennis E. Burson, and Erin S. Dormedy, University of Nebraska-Lincoln, Lincoln, NE, USA
- P147 ♦ Determining Exposure Assessment and Modelling Risks Associated with the Preparation of Poultry Products in the Home in the United Kingdom – WENDY HARRISON, Chris Griffith, David Tennant, and Adrian Peters, University of Wales Institute, Cardiff, Cardiff, Wales, UK
- P148 ♦ Validation of the Use of Antibiotic-resistant Strains of *Escherichia coli* O157:H7 and *Salmonella* spp. for Recovery of Injured Cells Subjected to Stress Conditions Encountered during Competitive Inhibition – M. M. BRASHEARS, J. S. Stratton, and A. Amezcua, University of Nebraska-Lincoln, Lincoln, NE, USA
- P149 ♦ Ochratoxin A Production by Black *Aspergillus* Species and Significance to the Food Industry – AILSA D. HOCKING, Sulin Leong, and John I. Pitt, Food Science Australia, CSIRO, North Ryde, NSW, Australia
- P150 ♦ Evaluation of Electrochemiluminescent Assays for the Rapid Detection of Foodborne Pathogens on Environmental Surfaces – RICHARD OBISCO, Chuck Yound, and Jill White, IGEN International, Inc., Gaithersburg, MD, USA
- P151 ♦ Development and Evaluation of a Multiplex PCR Assay for Specific Detection of *Campylobacter jejuni*, *Escherichia coli* O157:H7, *Listeria monocytogenes*, and *Salmonella* in Contaminated Food – M. F. SLAVIK, Debby Winters, and Awilda O'Leary, University of Arkansas, Fayetteville, AR, USA

(Wednesday a.m. continued)

- P152 ♦ Microbial Efficacy and Organoleptic Impact of X-ray Irradiation on Ready-to-eat Hot Dogs Inoculated with *Listeria monocytogenes* – THOMAS HARRIS, and Sally Swart, Ecolab, Inc., St. Paul, MN, USA
- P153 ♦ Ester Peracids: New Antimicrobial Compositions – BRUCE CORDS and Madeline French, Ecolab, Inc., St. Paul, MN, USA

## POSTER SYMPOSIUM

10:00 a.m. – 1:00 p.m.

(Authors present 10:30 a.m. – 12:30 p.m.)

### S18 Detection and Control of Human Pathogens in Fresh Fruit and Vegetables

- ♦ Sampling and Detection of Bacterial Pathogens in Fresh Produce – PINA M. FRATAMICO, USDA-ARS-ERRC, Wyndmoor, PA, USA
- ♦ Potential Sources of *Escherichia coli* O157:H7 Contamination of Apples during Growth, Harvesting, Distribution, and Processing – BASSAM A. ANNOUS, USDA-ARS-ERRC, Wyndmoor, PA, USA
- ♦ Microbial Safety of Sprouts – WILLIAM F. FETT, USDA-ARS-ERRC, Wyndmoor, PA, USA
- ♦ Surface Characteristics and Adhesion of *Salmonella stanley*, *Listeria monocytogenes*, and *Escherichia coli* on Cantaloupe Surfaces Treated with Chlorine or Hydrogen Peroxide – DIKE O. UKUKU, USDA-ARS-ERRC, Wyndmoor, PA, USA
- ♦ Human Pathogens on Produce: Attachment, Biofilms and Ecology – ROBERT E. MANDRELL, USDA-ARS-WRRC, Albany, CA, USA
- ♦ Methods in Decontaminating Fruits and Vegetables – LARRY R. BEUCHAT, University of Georgia, Griffin, GA, USA

## WEDNESDAY AFTERNOON — AUGUST 8, 2001

1:30 p.m. — 5:00 p.m.

### S19 HACCP: How to Evaluate Success

- 1:30 ♦ USDA HACCP: How to Evaluate Success – THOMAS BILLY, USDA-FSIS, Washington, D.C., USA
- 2:15 ♦ FDA Seafood and Juice HACCP: Microbial Testing and Other Tools to Measure Success – ROBERT L. BUCHANAN, FDA-CFSAN, Washington, D.C., USA
- 3:00 ♦ Break

- 3:30 ♦ CDC: Using Epidemiology to Evaluate HACCP – ROBERT V. TAUXE, CDC, Atlanta, GA, USA
- 4:00 ♦ Industry Perspective: Is HACCP Working for the Food Industries? – R. BRUCE TOMPKIN, ConAgra Refrigerated Prepared Food, Downer's Grove, IL, USA
- 4:30 ♦ Consumer Perspective: Is HACCP Improving Food Safety? – CAROLINE SMITH-DEWAAL, Center for Science in the Public Interest, Washington, D.C., USA

### S20 ILSI North America-sponsored Research Updates

- 1:30 ♦ Engineering Vegetative Buffer Strips for Removal of *Cryptosporidium parvum* from Runoff from Dairies and Grazed Agricultural Land – EDWARD R. ATWILL, University of California-Davis, Tulare, CA, USA
- 2:00 ♦ Optimization of Conditions to Kill *Escherichia coli* O157:H7 in Manure – MICHAEL P. DOYLE, University of Georgia, Griffin, GA, USA
- 2:30 ♦ Effect of Organic Acid Content of Silages on the Growth of *Escherichia coli* O157:H7 and *Salmonella* Typhimurium DT104 on Total Mixed Rations – DALE D. HANCOCK, Washington State University, Pullman, WA, USA
- 3:00 ♦ Break
- 3:30 ♦ Molecular Tools for Identification of *Listeria monocytogenes* Serotype 4b Strains – SOPHIA KATHARIOU, North Carolina State University, Raleigh, NC, USA
- 4:00 ♦ Effects of Environment and Management on Persistence of Antibiotic Resistance in Bacteria from Swine – ALAN G. MATHEW, University of Tennessee, Knoxville, TN, USA
- 4:30 ♦ Factors Affecting Transfer of Genes Encoding Multiple Antibiotic Resistance to *Salmonella* Typhimurium DT104 – CORNELIUS POPPE, Health Canada, Guelph, Ontario, Canada

### S21 The Benefits of Better Government and Industry Relations in Assuring Food Safety

- 1:30 ♦ Current State of Federal Government/ Industry Food Safety Relations: FSIS Perspective – RON HICKS, USDA-FSIS, Washington, D.C., USA

2:00 ♦ Current State of Federal Government/  
Industry Food Safety Relations: FDA/  
CFSAN Perspective – JOHN KVENBERG,  
FDA-CFSAN, Washington, D.C., USA

2:30 ♦ Current State of Federal Government/  
Industry Food Safety Relations: Industry  
Perspective – MARK DOPP, American  
Meat Institute, Arlington, VA, USA

3:00 ♦ Break

3:30 ♦ Current State of Federal Government/  
Industry Food Safety Relations: State  
Perspective – MARTHA ROBERTS, Florida  
Dept. of Agriculture and Consumer Affairs,  
Tallahassee, FL, USA

4:00 ♦ Current State of Federal Government/  
Industry Food Safety Relations: Food  
Service Perspective – STEVEN GROVER,  
National Restaurant Association,  
Washington, D.C., USA

4:30 ♦ Panel Discussion

### **T05 General Food Microbiology**

1:30 ♦ Death Kinetics of *Listeria monocytogenes*  
T49 in Margarine, Yellow Fat Spreads, and  
Toppings – MICHAEL C. CIRIGLIANO and  
Andreas M. Keller, Lipton, Cresskill, NJ,  
USA

1:45 ♦ Survey of Pasteurized Milk at Retail in the  
T50 United States for *Listeria monocytogenes*  
– CARY P. FRYE, Milk Industry Founda-  
tion/International Foods Association,  
Washington, D.C., USA

2:00 ♦ The Thermal Resistance of *Listeria mono-*  
T51 *cytogenes* as Affected by the pH and Water  
Activity of the Heating Menstruum –  
S. G. EDELSON-MAMMEL, R. L. Buchanan,  
and R. C. Whiting, FDA-CFSAN, Wash-  
ington, D.C., USA

2:15 ♦ Foodworkers as a Source for Salmonellosis  
T52 – C. MEDUS, J. B. Bender, K. E. Smith,  
F. T. Leano, J. Besser, and C. H. Hedberg,  
Minnesota Dept. of Health, Minneapolis,  
MN, USA

2:30 ♦ Yeast Inactivation Kinetics during Therm-  
T53 oultrasonication Treatments – A. LOPEZ-  
MALO, E. Palou, and A. Franco-Corzo,  
Universidad de las Americas-Puebla,  
Cholula, Puebla, Mexico

2:45 ♦ The Biocidal Efficacy of High Retention Gel  
T54 Oxidant Sanitizers on Vertical and Irregular  
Surfaces – CHARLES J. GIAMBRONE and  
Crystal Nesbitt, FMC Corp., Princeton, NJ,  
USA

3:00 ♦ Break

3:30 ♦ Assessing and Reducing the Risk of Cross  
T55 Contamination in Food Service – CHRIS  
GRIFFITH, Carys Davies, Jane Breverton,  
and Adrian Peters, University of Wales  
Institute Cardiff, Cardiff, UK

3:45 ♦ Exposure Assessment for Human  
T56 Pathogens Transmitted by Poor Handling  
Practices of Ready-to-eat (RTE) Foods –  
HEEJEONG LATIMER, Lee-Ann Jaykus,  
Roberta Morales, and Peter Cowen, North  
Carolina State University, Raleigh, NC, USA

4:00 ♦ Physicians' Attitudes toward Food Safety  
T57 Education – Anthony Flood, DAVID  
SCHMIDT, Gillian Steele, and Christie  
White, International Food Information  
Council, Washington, D.C., USA

4:15 ♦ Effect of Peroxy Acid Sanitizers against  
T58 Bacteriophage Associated with Cultured  
Dairy Products – JEROME KELLER, Ecolab  
Inc., Mendota Heights, MN, USA

4:30 ♦ Molecular Epidemiology of Norwalk-like  
T59 Virus Outbreaks in Minnesota – E. SWANSON,  
J. Bartkus, L. Carroll, K. Smith, J. Hunt,  
J. Besser, and C. Hedberg, Minnesota Dept.  
of Health, Minneapolis, MN, USA

4:45 ♦ Technology Requirements and Technology  
T60 Transfer in the Welsh Food Industry –  
DAVID LLOYD, Emma Norman, and Chris  
Griffith, University of Wales Institute  
Cardiff, Cardiff, UK



## EVENT INFORMATION

### Evening Events

#### **Cheese and Wine Reception**

Sunday, August 5, 2001 (8:00 p.m. - 10:00 p.m.)

Attendees and guests will experience Midwestern hospitality at this traditional Sunday evening reception in the exhibit hall.

#### **Exhibit Hall Reception**

Monday, August 6, 2001 (5:00 p.m. - 6:30 p.m.)

Network with fellow food safety professionals during this informal reception while seeing the latest developments in the industry.

#### **Monday Night Social — Mississippi River Dinner Cruise**

Monday, August 6, 2001 (6:00 p.m. - 10:00 p.m.)

The mighty Mississippi River is the reason Minneapolis and St. Paul exist today. Feel the history of the Mississippi River on this spectacular dinner cruise. You will quickly escape into an island of nature in the midst of this major metropolitan area with old St. Anthony, where Minneapolis began, on one side and the spectacular downtown skyline on the other. At your leisure you may dine, socialize with friends and colleagues, or walk around the riverboat and experience the view from the upper deck. The riverboat travels through the Upper St. Anthony Falls Lock, the northern most lock of 29 on the Mississippi River and the deepest — it descends 50 feet! You pass under both the historic James J. Hill Stone Arch Bridge and the new Hennepin Avenue suspension bridge. This will be a river experience you will long remember.

August 5-8, 2001

## Hilton Minneapolis

Minneapolis, Minnesota

#### **Chanhasen Dinner Theater**

Tuesday, August 7, 2001 (5:30 p.m. - 11:00 p.m.)

Food and entertainment — what a perfect combination! The people at Chanhasen Dinner Theater know this and have been working hard since 1968 to perfect this concept. Quoted as “the Cadillac of Dinner Theaters,” it is the nation’s largest professional dinner theater complex. Your ticket includes roundtrip transportation, dinner, and theater ticket to the performance of “My Fair Lady”. Limited tickets are available.

#### **Minnesota Twins Baseball Game**

Tuesday, August 7, 2001 (6:00 p.m. - 10:00 p.m.)

Go Twins! Cheer on the Minnesota Twins as they take on the Cleveland Indians in the Hubert H. Humphrey Metrodome. The Metrodome was the third domed facility in baseball and remains the only air-supported structure of the 30 ballparks. Join your friends and colleagues for a night at the ballpark. Price includes transportation to and from the Metrodome and a reserved seat for the game.

#### **Awards Banquet**

Wednesday, August 8, 2001 (7:00 p.m. - 9:30 p.m.)

A special occasion to formally recognize the accomplishments of deserving food safety professionals. An elegant reception and dinner are followed by the awards ceremony. Business attire requested.

### Daytime Tours

#### **Twin Cities Highlights Tour**

Sunday, August 5, 2001 (9:30 a.m. - 2:30 p.m.)

The fantastic diversity of the Greater Twin Cities Metro Area often catches first-time visitors by surprise. This tour includes both downtowns of St. Paul and Minneapolis. While in Minneapolis you will experience the famous Nicollet Mall, the

skyway network of downtown Minneapolis and the Minneapolis Sculpture Garden. The journey will continue through the Kenwood residential area to see the television home of Mary Tyler Moore, around sparkling lakes and lagoons, and make a short stop at the legendary Minnehaha Falls. Then it is on past Fort Snelling and into St. Paul. A guide will provide commentary on many sites including the trip along stately Summit Avenue, showcasing the best-preserved Victorian mansions in the country. The final stop is at the Minnesota History Center. The Center showcases and preserves the state's historical resources. Lunch will be provided at the History Center. The tour concludes with a drive past the University of Minnesota and an excursion into the St. Anthony Falls area – the birthplace of Minneapolis.

### **Historic Stillwater**

Monday, August 6, 2001 (9:30 a.m. – 3:30 p.m.)

A trip to Stillwater is a trip to Minnesota's yesteryear. Located on the sparkling blue St. Croix River, Stillwater lays claim to being Minnesota's oldest town and the birthplace of the Minnesota Territory in 1849. The tour guide will provide a riding tour of this enchanting old river-town and takes you behind the scenes of history. Anecdotes and incidents from bygone years will illuminate the lives of immigrants and entrepreneurs as you view mansions built by wealthy lumber barons and beautiful old churches on the "Street of Spires." You will stop at the Warden's Home Museum, an 1853 home for 11 wardens who managed the first territorial prison in that part of the country. Next, enjoy a delicious lunch at the famed Lowell Inn. Since 1927 this famous "Mount Vernon of the Midwest" has been a hotel known to serve the very finest food. You will have time after lunch to explore the many boutiques, galleries and shops that line Stillwater's historic streets.

### **Mansions & Museums Tour**

Tuesday, August 7, 2001 (9:30 a.m. – 3:30 p.m.)

The first stop of the day will be the James J. Hill House on Summit Avenue in St. Paul. James J. Hill, the "Empire Builder," purchased a bankrupt railroad in St. Paul in the late 1800s and masterminded its success by building the Great Northern Railway. Completed in 1891, the house has 36,000 square feet, including 32 rooms, 13 bathrooms, and 22 fireplaces. With its carved woodwork, stained glass, and skylit art gallery, it is one of the most impressive residences ever constructed in the Midwest. Next, you will stop at the Cathedral of St. Paul. Modeled after St. Peter's in Rome, it is one of the largest church

buildings in North America. Among its many points of interest are the six chapels called the Shrine of Nations in which stand statues of the patron saints carved out of marble. Following the stop at the Cathedral, you will have lunch at Forepaugh's Restaurant, an elegant Victorian mansion complete with a French chef and staff in period costumes. After lunch, your final stop is at the Minneapolis Institute of Arts. The permanent collection includes American, European, Asian, African, Oceanic ancient and Oriental objects. Masterpieces from every age and culture await your discovery.

### **New Member Reception and Orientation**

#### **New Member Reception and Orientation**

Saturday, August 4, 2001 (4:30 p.m. – 5:30 p.m.)

If you recently joined the Association or if this is your first time attending an IAFP Annual Meeting, welcome! Attend this informal reception to learn how to get the most out of attending the Meeting. Meet some of today's leaders and gain knowledge on how you too can become a leader in your Association.

### **Affiliate Reception**

#### **Affiliate Reception**

Saturday, August 4, 2001 (5:30 p.m. – 7:00 p.m.)

Affiliate officers and delegates plan to arrive in time to participate in this educational reception. Watch your mail for additional details.

### **Committee Meetings**

#### **Committee Meetings**

Sunday, August 5, 2001 (7:00 a.m. – 5:00 p.m.)

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

### **Student Luncheon**

#### **Student Luncheon**

Sunday, August 5, 2001 (12:00 p.m. – 1:30 p.m.)

Attention students, are you a Member of the Student Professional Development Group (PDG)? Join by signing up for the student luncheon to help you start building your professional network. The mission of the Student PDG is to provide students of food safety with a platform to enrich their experience as Members of IAFP.



# International Association for Food Protection®

## 88th Annual Meeting

6200 Aurora Avenue, Suite 200W  
Des Moines, IA 50322-2863, USA  
Phone: 800.369.6337 • 515.276.3344  
Fax: 515.276.8655  
E-mail: info@foodprotection.org  
Web site: www.foodprotection.org



**August 5-8, 2001**  
**Minneapolis, Minnesota**

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

### Meeting Information

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

Registration includes:

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

### 4 Easy Ways to Register

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



**Phone:** 800.369.6337; 515.276.3344



**Fax:** 515.276.8655



**Mail:** 6200 Aurora Avenue, Suite 200W,  
Des Moines, IA 50322-2863



**Web site:** www.foodprotection.org

**The early registration deadline is July 6, 2001.** After July 6, 2001 late registration fees are in effect. Pick up registration materials on site at the Hilton Minneapolis.

### Refund/Cancellation Policy

Registration fees, less a \$50 administration fee and any applicable bank charges, will be refunded for written cancellations received by July 13, 2001. No refunds will be made after July 13, 2001; however, the registration may be transferred to a colleague with written notification. Refunds will be processed after August 13, 2001. Additional tickets purchased are nonrefundable.

### Exhibit Hours

Sunday, August 5, 2001 — 8:00 p.m. – 10:00 p.m.  
Monday, August 6, 2001 — 9:30 a.m. – 1:30 p.m.  
3:00 p.m. – 6:30 p.m.  
Tuesday, August 7, 2001 — 9:30 a.m. – 1:30 p.m.

### Hotel Information

For reservations, contact the hotel directly and identify yourself as an International Association for Food Protection Annual Meeting attendee to receive a special rate of \$129 per night, single or double. Make your reservations as soon as possible; this special rate is available only until July 6, 2001.

Hilton Minneapolis  
1001 Marquette Avenue  
Minneapolis, Minnesota 55403  
612.376.1000  
1.800.HILTONS

### Evening Events

#### Sunday, August 5, 2001

Opening Session (7:00 p.m. – 8:00 p.m.)  
Cheese and Wine Reception (8:00 p.m. – 10:00 p.m.)

#### Monday, August 6, 2001

Exhibit Hall Reception (5:00 p.m. – 6:30 p.m.)  
Monday Night Social, **Mississippi Dinner Cruise**  
(6:00 p.m. – 10:00 p.m.)

#### Tuesday, August 7, 2001

Chanhassen Dinner Theatre (5:30 p.m. – 11:00 p.m.)  
Minnesota Twins Baseball Game (6:00 p.m. – 10:00 p.m.)

#### Wednesday, August 8, 2001

Awards Banquet (7:00 p.m. – 9:30 p.m.)

### Daytime Tours

*(Lunch included in all daytime tours)*

#### Sunday, August 5, 2001

Twin Cities Highlights (9:30 a.m. – 2:30 p.m.)

#### Monday, August 6, 2001

Historic Stillwater (9:30 a.m. – 3:30 p.m.)

#### Tuesday, August 7, 2001

Mansions & Museums (9:30 a.m. – 3:30 p.m.)





**International Association for Food Protection**

6200 Aurora Avenue, Suite 200W  
Des Moines, IA 50322-2863, USA  
Phone: 800.369.6337 • 515.276.3344  
Fax: 515.276.8655  
E-mail: info@foodprotection.org  
Web site: www.foodprotection.org



**Attendee Registration Form**

**August 5-8, 2001  
Minneapolis, Minnesota**

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

Title \_\_\_\_\_ Employer \_\_\_\_\_

Mailing Address (Please specify:  Home  Work) \_\_\_\_\_

City \_\_\_\_\_ State/Province \_\_\_\_\_ Country \_\_\_\_\_ Postal/Zip Code \_\_\_\_\_

Telephone \_\_\_\_\_ Fax \_\_\_\_\_ E-mail \_\_\_\_\_

First time attending meeting \_\_\_\_\_ Member since: \_\_\_\_\_

Regarding the ADA, please attach a brief description of special requirements you may have.

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

**PAYMENT MUST BE RECEIVED BY JULY 6, 2001 TO AVOID LATE REGISTRATION FEES**

REGISTRATION FEES:	MEMBERS	NONMEMBERS	TOTAL
Registration (Awards Banquet included)	\$ 275 (\$325 late)	\$415 (\$465 late)	_____
Association Student Member*	\$ 45 (\$ 55 late)	Not Available	_____
Retired Association Member*	\$ 45 (\$ 55 late)	Not Available	_____
One Day Registration: <input type="checkbox"/> Mon. <input type="checkbox"/> Tues. <input type="checkbox"/> Wed.	\$ 155 (\$180 late)	\$210 (\$235 late)	_____
Spouse/Companion* (Name): _____	\$ 45 (\$ 45 late)	\$ 45 (\$ 45 late)	_____
Children 15 & Over* (Names): _____	\$ 25 (\$ 25 late)	\$ 25 (\$ 25 late)	_____
Children 14 & Under* (Names): _____	FREE	FREE	_____
*Awards Banquet not included			

EVENTS:		# OF TICKETS	
Student Luncheon (Sunday, 8/5)	\$ 5 (\$ 10 late)	_____	_____
Monday Night Social, Mississippi Dinner Cruise (Monday, 8/6)	\$ 39 (\$ 44 late)	_____	_____
Children 14 and under	\$ 34 (\$ 39 late)	_____	_____
Chanhassen Dinner Theatre (Tuesday, 8/7)	\$ 75 (\$ 80 late)	_____	_____
Minnesota Twins Baseball Game (Tuesday, 8/7)	\$ 21 (\$ 26 late)	_____	_____
Awards Banquet (Wednesday, 8/8)	\$ 45 (\$ 50 late)	_____	_____

DAYTIME TOURS:			
(Lunch included in all daytime tours)			
Twin Cities Highlights (Sunday, 8/5)	\$ 40 (\$ 45 late)	_____	_____
Historic Stillwater (Monday, 8/6)	\$ 47 (\$ 52 late)	_____	_____
Mansions & Museums (Tuesday, 8/7)	\$ 49 (\$ 54 late)	_____	_____

**Payment Options:**

Check Enclosed

\_\_\_\_\_

Name on Card \_\_\_\_\_

Signature \_\_\_\_\_

**TOTAL AMOUNT ENCLOSED \$** \_\_\_\_\_

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**JOIN TODAY AND SAVE!!!**

(Attach a completed Membership application)  
(See page 556 of this issue  
for a membership application)

Expiration Date \_\_\_\_\_

**EXHIBITORS DO NOT USE THIS FORM**



## Hilton Minneapolis Minneapolis, Minnesota



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Food Protection®

# WORKSHOPS

### Workshop I Critical Steps in Laboratory Methods for the Detection of *Listeria monocytogenes*

This workshop offers information on the potential pitfalls or errors associated with the detection of *Listeria monocytogenes* in foods. The methods examined will include cultural (FDA/USDA), Immunological, Nucleic Acid, Subtyping, and Pulse Field Electrophoresis. Participants will be introduced to the limitations of each method, and possible modifications to insure the accuracy and effectiveness of your analysis. The workshop includes a laboratory section at the University of Minnesota allowing participants to view many of the common mistakes associated with *Listeria* analysis. Participants will also join in a round table discussion to share problems and ideas.

#### Workshop Topics

- Development and Validation of Methodologies for the Detection of *L. monocytogenes*
- Critical Steps in the Detection of *L. monocytogenes* Using Immunological Methods
- Critical Steps in the Detection of *L. monocytogenes* Using Nucleic Acid Methods
- Critical Steps in the Detection of *L. monocytogenes* Using RAPD and PFE
- Critical Steps in the Detection of *L. monocytogenes* Using Cultural Methods
- The Regulatory Perspective on *L. monocytogenes* Testing

#### Instructors

**James R. Agin**, Ohio Department of Agriculture, Reynoldsburg, OH

**Jeffrey M. Farber, Ph.D.**, Health Canada, Ottawa, Ontario, Canada

**Judy Fraser-Heaps**, Pillsbury Company, Apple Valley, MN

**Anthony D. Hitchins, Ph.D.**, FDA, Washington, D.C.

**Timothy C. Jackson, Ph.D.**, Nestlé USA, Dublin, OH

**Melissa C. Newman, Ph.D.**, University of Kentucky, Lexington, KY

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

#### Who Should Attend?

Individuals working in food microbiology laboratories currently performing or planning to perform *Listeria* analysis.

#### Hours for Workshop

Friday August 3, 2001	Saturday August 4, 2001
<b>Registration</b> – 7:30 a.m. Continental Breakfast	7:30 a.m. Continental Breakfast
<b>Workshop</b> – 8:00 a.m. – 5:00 p.m. (Lunch Provided)	<b>Workshop</b> – 8:00 a.m. – 4:00 p.m. (Lunch Provided)

## Workshop II Applying Advanced Techniques to HACCP Systems

(Co-sponsored by the US Poultry and Egg Association)

The purpose of this workshop is to provide an overview of business tools that can be applied to HACCP systems for process evaluation and improvement. This is not an introductory HACCP course. Rather, attendees will be expected to have a basic understanding of HACCP, and should have experience in working with an implemented HACCP system. A further processed poultry model serves as a focal point upon which other workshop topics are presented and discussed.

### Workshop Topics

- The Process Model – Further Processed Poultry
- Data Collection, Interpretation, and Response
- Auditing
- Recall Management

### Instructors

**S. F. Bilgili, Ph.D.**, Auburn University, Auburn, AL

**Don Conner, Ph.D.**, Auburn University, Auburn, AL

**Steve Knight**, US Poultry & Egg Association, Tucker, GA

### Who Should Attend?

HACCP, quality, production, and management personnel of food processing plants using HACCP in their facilities. In particular, meat and poultry processors operating under mandatory HACCP, however, the principles and applications presented in this workshop are applicable to all segments of the food industry.

### Hours for Workshop

**Friday  
August 3, 2001**

**Registration –**  
7:30 a.m. Continental  
Breakfast

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

**Saturday  
August 4, 2001**

7:30 a.m. Continental  
Breakfast

**Workshop –**  
8:00 a.m. - 4:00 p.m.  
(Lunch Provided)

## Workshop III Crisis! Recall Management in the Food Industry

The legal aspects of dealing with crisis will be discussed as well as how to assess your risk and exposure before a crisis occurs. The nuts and bolts of dealing with crisis will be reviewed as well as a comprehensive discussion of how to deal with all aspects of the media.

### Workshop Topics

- Legal Ramifications of a Food Recall
- How to Prevent a Crisis
- The Anatomy and Physiology of a Crisis
- Media/Interview in Times of Crisis
- Establishment of a Crisis Team and Plan

### Instructors

**William Marler**, Marler Clark Attorneys at Law, Seattle, WA

**Gale Prince**, The Kroger Co., Cincinnati, OH

**Larry L. Smith**, Institute of Crisis Management, Louisville, KY

**Jim Spata, Ph.D.**, New-Tech Consulting, Cincinnati, OH

**Robert Strong, Ph.D.**, DiverseyLever Consulting, Liberty Town, OH

### Who Should Attend?

Management personnel responsible for writing or implementing a crisis management plan.

### Hours for Workshop

**Saturday  
August 4, 2001**

**Registration –** 7:30 a.m. Continental Breakfast

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

(Workshop registration form on page 544).

# Annual Meeting Workshops

## ● Registration Form ●



# Hilton Minneapolis

Minneapolis, Minnesota

Friday-Saturday, August 3-4, 2001

- Workshop I:** Critical Steps in Laboratory Methods for the Detection of *Listeria monocytogenes*
- Workshop II:** Applying Advanced Techniques to HACCP Systems

Saturday, August 4, 2001

- Workshop III:** Crisis! Recall Management in the Food Industry

First Name (will appear on badge)

Last Name

Company

Job Title

Address

City

State/Province

Country

Postal Code/Zip + 4

Area Code & Telephone

Fax

E-mail

Member #

Check Enclosed



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

--	--	--	--	--	--	--	--	--	--	--	--

Signature

Expiration date

**Register by July 13, 2001 to avoid late registration fees**

### ● Registration ●

**WORKSHOP I: Critical Steps in Laboratory Methods for the Detection of *Listeria monocytogenes***

	Early Rate	Late Rate
IAFP Member	\$475	\$550
NonMember	\$575	\$650

**WORKSHOP II: Applying Advanced Techniques to HACCP Systems**

	Early Rate	Late Rate
IAFP Member	\$450	\$525
NonMember	\$550	\$625

**WORKSHOP III: Crisis! Recall Management in the Food Industry**

	Early Rate	Late Rate
IAFP Member	\$285	\$360
NonMember	\$385	\$460

#### GROUP DISCOUNT:

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

For further information, please contact the Association office at 800.369.6337; 515.276.3344; Fax: 515.276.8655; E-mail: [jcatnach@foodprotection.org](mailto:jcatnach@foodprotection.org).

#### Refund/Cancellation Policy

Registration fees, less a \$50 administrative charge, will be refunded for written cancellations received by July 20, 2001. No refunds will be made after that date; however, the registration may be transferred to a colleague with written notification. Refunds will be processed after August 13, 2001. The workshop may be cancelled if sufficient enrollment is not received by July 13, 2001.

### ● 4 Easy Ways to Register ●

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



**Phone:** 800.369.6337; 515.276.3344



**Fax:** 515.276.8655



**Mail:** 6200 Aurora Avenue, Suite 200W, Des Moines, IA 50322-2863



**Web site:** [www.foodprotection.org](http://www.foodprotection.org)



# CONTRIBUTE to the Fourth Annual Foundation Fund Silent Auction Today!

The Foundation of the International Association for Food Protection will hold its Annual Silent Auction during IAFP 2001, the Association's 88th Annual Meeting in Minneapolis, Minnesota August 5-8, 2001. The Foundation Fund supports the following:

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

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

- ◆ Food Safety Videos
- ◆ California Salted Pistachios
- ◆ Pearl Necklace
- ◆ Missouri Country Sugar Cured Ham
- ◆ New Jersey Devils Hockey Jersey
- ◆ Waterford Crystal Vase
- ◆ IAFP Polo Shirts
- ◆ Wine

Complete the form and send it in today. Notification of donated items must be received by June 15, 2001 to be listed in the Program and Abstract Book.



-----

Description of auction items \_\_\_\_\_

Estimated Value \_\_\_\_\_

Name of Donor \_\_\_\_\_

Company (if relevant) \_\_\_\_\_

Mailing Address \_\_\_\_\_  
(Please specify:  Home  Work)

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Telephone # \_\_\_\_\_ Fax # \_\_\_\_\_

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**Return to:**  
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International Association for Food Protection  
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# Coming Events

## JULY

• **6-13, International Workshop and Mini-Symposium on Rapid Methods and Automation in Microbiology XXI**, Kansas State University, Manhattan, KS. For further information, contact Daniel Y. C. Fung at 785.532.5654; Fax: 785.532.5681; E-mail: dfung@oznet.ksu.net.

• **15-18, 38th Annual Florida Pesticide Residue Workshop**, St. Pete Beach, FL. For additional information, contact Dr. Joanne Brown, at 850.488.0670; fax: 850.488.4226; E-mail: flprw@doacs.state.fl.us.

• **18-20, 4th Annual Food-borne Pathogen Analysis Conference**, St. Pete Beach, FL. For additional information, contact Dr. Joanne Brown, at 850.488.0670; fax: 850.488.4226; E-mail: flprw@doacs.state.fl.us.

• **30-Aug. 1, Silliker Practical HACCP Course**, Huntington Beach, CA. For further information, contact Silliker at 708.957.7878.

## AUGUST

• **2-3, Silliker Advanced HACCP Course**, Huntington Beach, CA. For further information, contact Silliker at 708.957.7878.

• **3, 3-A Third Party Accreditation Meeting**, Minneapolis, Hilton, Minneapolis, MN. To register, contact Philomena Short or Tom Gilmore at 703.761.2600; E-mail: pshort@iafis.org, or tgilmore@iafis.org.

• **3-4, IAFP Workshops**, Minneapolis, MN.

• Workshop I "Critical Steps in Laboratory Methods for the Detection of *Listeria monocytogenes*."

• Workshop II "Applying Advanced Techniques to HACCP Systems."

• Workshop III "Crisis! Recall Management in the Food Industry."

Additional workshop information available in this issue of *DFES* on page 542.

• **5-8, IAFP 2001, the Association's 88th Annual Meeting**, Minneapolis, MN. Registration materials available in this issue of *DFES* on page 541 or contact Julie Cattanach at 800.369.6337; 515.276.3344; fax: 515.276.8655; E-mail: jcattanach@foodprotection.org. Visit our Web site at [www.foodprotection.org](http://www.foodprotection.org) for the most current Annual Meeting information.

• **22-26, The National Society for Healthcare Foodservice Management (HFM) Annual Conference**, The Saddlebrook Resort in Tampa, FL. For additional information, contact Sheila Crowley at 202.546.7236; E-mail: smc@hfm.org.

## SEPTEMBER

• **5, Managing Dairy Food Safety Workshop**, Madison, WI. For additional information, contact W. L. Wendorff at 608.263.2015; E-mail: wlwendor@facstaff.wisc.edu.

• **11, The International Inflight Food Service Association (IFSA) Second Annual Food Safety Summit**, Renaissance Concourse Hotel, Atlanta, GA. For additional information, contact IFSA at 502.583.3788.

• **13-15, 2nd International Mastitis & Milk Quality Symposium**, Vancouver, British Columbia, Canada. For additional information, contact National Mastitis Council, 608.224.0622; fax: 608.224.0644; E-mail: nmc@nmconline.org.

• **18-20, New York State Association of Milk and Food Sanitarians Annual Meeting**, Holiday Inn, Syracuse/Liverpool. For additional information, contact Janene Lucia at 607.255.2892.

• **24-26, Indiana Environmental Health Association, Inc., Fall Conference**, Holidome, Columbus, IN. For further information, contact Helene Uhlman at 219.853.6358.

• **25-26, Wisconsin Milk and Food Sanitarians Association 2001 Joint Conference**, Chula Vista Resort and Conference Center, Wisconsin Dells, WI. For further information, contact Kathy Glass at 608.263.6935.

• **26-28, Washington Association for Food Protection Annual Conference**, Campbell's Lake Chelan Resort and Conference Center, Chelan, WA. For further information, contact Bill Brewer at 206.363.5411.

## OCTOBER

• **10-11, Iowa Association for Food Protection Annual Meeting**, Starlite Village, Ames, IA. For further information, contact Monica Streicher at 712.324.0163.

• **15-17, European Hygienic Equipment Design Group (EHEDG) with AINIA 11th Annual Conference and Workshop, Food in Europe: Building in Safety**, Valencia, Spain. For further information, visit [www.ainia.es/safetycongress](http://www.ainia.es/safetycongress).

• **15-18, North Dakota Environmental Health Association Fall Meeting**, Best Western Doublewood Inn, Bismarck, ND. For further information, contact Deb Larson at 701.328.1292.

• **16-18, 1st International Symposium on the Spray Drying of Milk Products**, Rennes, France. For additional information, E-mail: sympo2001@rennes.inra.fr.

• **18-21, Worldwide Food Expo**, McCormick Place, Chicago, IL. For additional information, call 202.371.9243.

• **24-25, Associated Illinois Milk, Food and Environmental Sanitarians Annual Meeting**, Stoney Creek Inn, East Peoria, IL. For further information, contact Pat Callahan at 217.854.2547.

**NOVEMBER**

• **3-6, International Exposition for Food Processor®**, Navy Pier, Chicago, IL. For further information, Nancy Janssen at

800.331.8816; E-mail: njanssen@fpmsa.org.

• **7-8, Alabama Association for Food Protection Annual Meeting**, Homewood Holiday Inn, Birmingham, AL. For further information, contact Karen Crawford at 205.554.4546.

• **14-16, Florida Association for Food Protection Annual Education Conference**, FFA Leadership Training Center, Haines City, FL. For further information, contact Frank Yiannas at 407.397.6060.

• **14-17, Agritrade 2001**, Hyatt Regency Convention Center, Gua-

temala City, Mexico. For additional information, call 502.362.2002 ext. 163; Fax: 502.362.1950; E-mail: agritrade@agexpront.org.gt.

• **21-24, 3rd International Dairy and Food Technology Expo 2001**, Mumbai, India. For further information, call 49.0.221.8210; Fax: 49.0.221.821.2092; E-mail: idftexpo@kmi.koelnmesse.de.

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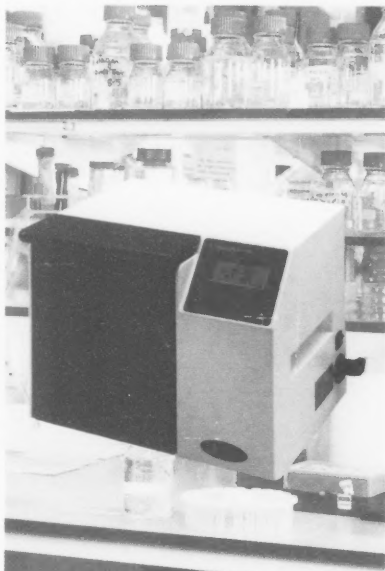
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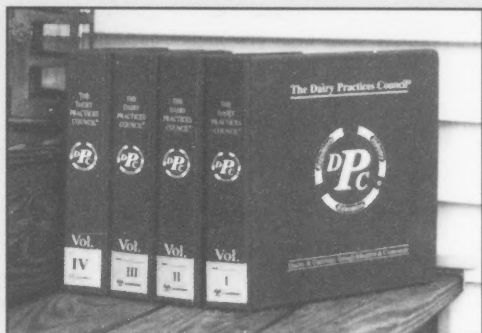
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| <input type="checkbox"/> E3120 | Global Warming: Hot Times Ahead   | <input type="checkbox"/> F2110 | Food Safety is No Mystery   | <input type="checkbox"/> F2370 | Supermarket Sanitation Program - "Cleaning & Sanitizing"                          |
| <input type="checkbox"/> E3130 | Kentucky Public Swimming Pool & Bathing Facilities  | <input type="checkbox"/> F2130 | Food Safety: You Make the Difference  | <input type="checkbox"/> F2380 | Supermarket Sanitation Program - "Food Safety"                                    |
| <input type="checkbox"/> E3135 | Plastic Recycling Today: A Growing Resource   | <input type="checkbox"/> F2125 | Food Safety Zone: Basic Microbiology  | <input type="checkbox"/> F2390 | Take Aim at Sanitation  |
| <input type="checkbox"/> E3140 | Putting Aside Pesticides  | <input type="checkbox"/> F2126 | Food Safety Zone: Cross Contamination   | <input type="checkbox"/> F2410 | Wide World of Food-Service Brushes  |
| <input type="checkbox"/> E3150 | Radon   | <input type="checkbox"/> F2127 | Food Safety Zone: Personal Hygiene  | <input type="checkbox"/> F2420 | Your Health in Our Hands - Our Health in Yours                                    |
| <input type="checkbox"/> E3160 | RCRA - Hazardous Waste  | <input type="checkbox"/> F2128 | Food Safety Zone: Sanitation  | <b>OTHER</b>                   |   |
| <input type="checkbox"/> E3170 | The New Superfund: What It is & How It Works-(1) Changes in the Remedial Process: Clean-up Standards & State Involvement Requirements |                                |   | <input type="checkbox"/> M4010 | Diet, Nutrition & Cancer  |
| <input type="checkbox"/> E3180 | The New Superfund: What It is & How It Works-(2) Changes in the Removal Process: Removal & Additional Program Requirements            |                                |   | <input type="checkbox"/> M4020 | Eating Defensively: Food Safety Advice for Persons with AIDS                      |
|                                |   |                                |   | <input type="checkbox"/> M4030 | Ice: The Forgotten Food   |
|                                |   |                                |   | <input type="checkbox"/> M4040 | Legal Aspects of the Tampering Case   |
|                                |   |                                |   | <input type="checkbox"/> M4050 | Personal Hygiene & Sanitation for Food Processing Employees                       |
|                                |   |                                |   | <input type="checkbox"/> M4060 | Psychiatric Aspects of Product Tampering  |
|                                |   |                                |   | <input type="checkbox"/> M4070 | Tampering: The Issue Examined   |

Visit our Web site at [www.foodprotection.org](http://www.foodprotection.org) for detailed tape descriptions

# Great Lake Superior Tour

Thursday, August 9 – Saturday, August 11, 2001

Come with us to visit an area of forests and mountains, water and wildlife, mining and logging, farming and festivals, shipping and shopping... We'll journey on a modern-day explorer's route winding through quaint towns to the bustling inland port of Duluth, and along the ocean-like shoreline of Lake Superior's North Shore.



## Thursday, August 9, 2001

We will depart at 9:00am via deluxe motorcoach with tour guide. A short rest stop is planned at Tobies for their famous rolls and coffee. Upon arrival to Duluth, free time and lunch (on own) will be enjoyed in the Canal Park area. This fantastically renovated area is complete with shops, restaurants, a museum, and more. The Marine Museum features information on the history of Lake Superior and Twin Ports commercial shipping of one of the world's busiest ports. Next, we'll board the North Shore Scenic Railroad for an enjoyable ride on the twenty-six miles of track that stretches along the waterfront and woodlands of Lake Superior between Duluth and Two Harbors. Dinner and an evening tour will be provided within Glensheen Mansion. Throughout the tour you'll also get ample history and a glimpse into the lives of Glensheen's heart and soul, iron mogul Chester Congdon and his family. Completed in 1908, this 22-acre country estate on the shore of Lake Superior is a tribute to both wealth and ingenuity. We'll check-in at Grand Superior Lodge, a four-seasons resort in the heart of the North Shore, with breathtaking views and the majestic sounds of Lake Superior crashing on the shore.



## Friday, August 10, 2001

Breakfast will be on your own in the dining room before we start off for the day. Today we continue our journey along the North Shore Drive of Lake Superior, one of the most spectacular roadways in the U.S. As we travel, we'll stop along the Lake at points of interest such as:

**GOOSEBERRY FALLS STATE PARK** — The Gooseberry River drops 100 feet to the Lake in series of breathtaking waterfalls and cascades at one of the most popular parks in the state.

**SPLIT ROCK LIGHT HOUSE** — Perched on a cliff 168 feet above Lake Superior, this 370,000 candle-power light has helped captains navigate their boats safely through an area of magnetic interference which rendered their compasses useless.

**MOOSE MOUNTAIN** — at Lutsen Resort — lunch today will be a treat as (weather permitting) we ride the gondola to the top of Moose Mountain for a picnic and a breathtaking view of the area.

Dinner tonight will be within the Resort. A short presentation by Warren Johnson on "Bear Grease" will follow. "Bear Grease" is the annual dog sled race that finishes in Duluth. The balance of the evening is on own to enjoy the resort.

## Saturday, August 11, 2001

We will depart from Grand Superior Lodge at 8:30am to stop for breakfast at Bennett's Restaurant in Fitger's Inn. Fitger's Inn is part of the Fitger's Brewery Complex. This renovated 1885 brewery houses unique shops, restaurants and lodging. Following breakfast we are off on a narrated sightseeing cruise on Lake Superior. This cruise provides for breathtaking scenery as we see lake freighters and salt water ships from around the world, the famous Aerial Lift Bridge, Barker's Island, a close view of busy grain elevators, and the panoramic St. Louis River. Following the harbor cruise, we will be on our way back to the Twin Cities, returning by 4:00pm.



**Lake Superior Package Price:** \$449.00 per person, double occupancy \$595.00 per person, single occupancy

**Tour Package Includes:** Deluxe motorcoach transportation, Metro Connections tour guide, two nights resort accommodations, rolls and coffee at Tobies, North Shore Scenic train ride, dinner and tour at Glensheen Mansion, breakfast on day two, Split Rock Lighthouse tour, lunch on day two, dinner and dog sled presentation on day two, breakfast and harbor cruise on day three, all applicable taxes and meal gratuities.

*This tour is offered on a first-come, first-served basis. In order to secure space, please send deposit of \$100.00 per person. The remaining balance will be due by Monday, June 25, 2001. If too few people register for the tour, it will be canceled and money refunded. Cancellations received on or before June 25, 2001 will receive a full refund. Any cancellation received after June 25, 2001 will incur a cancellation fee that will vary based upon the date of cancellation.*

### MetroConnections/IAFP GREAT LAKE SUPERIOR TOUR

Name: \_\_\_\_\_ Phone: (\_\_\_\_) \_\_\_\_\_ Roommate: \_\_\_\_\_ 930751

Address: \_\_\_\_\_ City: \_\_\_\_\_ State: \_\_\_\_\_ Zip: \_\_\_\_\_

<u>Tour</u>	<u>Amount</u>	<u># of people</u>	<u>Total amount</u>
Great Lake Superior Tour	\$449.00 per person (double)	_____ x \$100.00 deposit	= \$ _____
	\$595.00 per person (single)	_____ x \$100.00 deposit	= \$ _____

Please charge my credit card: Card Type: (circle one) V MC D AMEX

Card #: \_\_\_\_\_ Exp: \_\_\_\_\_ Signature: \_\_\_\_\_

Make check payable and mail to Metro Connections, Inc., 1219 Marquette Ave., Suite 110, Minneapolis, MN 55403 ☎ (800) 747-8687

# Invite A Colleague to Join

The International Association for Food Protection, founded in 1911, is a non-profit educational association of food safety professionals with a mission "to provide food safety professionals worldwide with a forum to exchange information on protecting the food supply."

## \* Who Should Join?

The Association is comprised of a diverse membership of 3,000 people from 50 nations. The International Association for Food Protection Members belong to all facets of the food protection arena including: Industry, Government and Academia.

## \* Why Should They Become Association Members?

**Dairy, Food and Environmental Sanitation** — A reviewed monthly publication that provides practical and applied research articles and association news, updates, and other related information for food safety professionals. All Members receive this publication as part of their Membership.

**Journal of Food Protection** — An international, refereed scientific journal of research and review papers on topics in food science and food aspects of animal and plant sciences. This journal is available to all individuals who request it with their Membership.

**The Audiovisual Library** — Provides quality training videos dealing with various food safety issues. Members are allowed free use of these videos.

**The Annual Meeting** — Is a unique educational event; three days of technical sessions, symposia and exhibits provide attendees with over 250 presentations on current topics in food protection. The International Association for Food Protection Members receive a substantially reduced registration fee.

## \* Help Others Find Out About the Association...

To learn more about the Association and the many other benefits and opportunities available to a Member, visit our Web site: [www.foodprotection.org](http://www.foodprotection.org) or please call 515.276.3344 or 800.369.6337; Fax: 515.276.8655; E-mail: [info@foodprotection.org](mailto:info@foodprotection.org). We will be happy to send new Member information if you provide us the necessary mailing information.



International Association for  
**Food Protection**®

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# MEMBERSHIP APPLICATION



**International Association for  
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Fax: 515.276.8655  
E-mail: info@foodprotection.org  
Web site: www.foodprotection.org

## MEMBERSHIP DATA:

Prefix ( Prof.  Dr.  Mr.  Ms.)

First Name \_\_\_\_\_ M.I. \_\_\_\_\_ Last Name \_\_\_\_\_

Company \_\_\_\_\_ Job Title \_\_\_\_\_

Mailing Address \_\_\_\_\_

(Please specify:  Home  Work)

City \_\_\_\_\_ State or Province \_\_\_\_\_

Postal Code/Zip + 4 \_\_\_\_\_ Country \_\_\_\_\_

Telephone # \_\_\_\_\_ Fax # \_\_\_\_\_

E-mail \_\_\_\_\_

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

## MEMBERSHIP CATEGORIES:

**Membership with JFP & DFES**  
12 issues of the *Journal of Food Protection*  
and *Dairy, Food and Environmental Sanitation*

◀ **BEST  
VALUE**

	US	Canada/ Mexico	International
Membership with JFP & DFES	\$150.00	\$175.00	\$220.00
Membership with DFES	\$90.00	\$100.00	\$115.00

**Membership with DFES**  
12 issues of *Dairy, Food and Environmental Sanitation*

### Student Membership\*

- JFP and DFES* \$75.00
- Journal of Food Protection* \$45.00
- Dairy, Food and Environmental Sanitation* \$45.00

JFP and DFES	\$75.00	\$100.00	\$145.00
Journal of Food Protection	\$45.00	\$60.00	\$90.00
Dairy, Food and Environmental Sanitation	\$45.00	\$55.00	\$70.00

\*Student verification must accompany this form

**All Prices Include Shipping & Handling**

**Sustaining Membership**  
Includes recognition for your organization  
and many other benefits. Contact IAFP for details.

	Gold	Silver	Sustaining
Sustaining Membership	\$5,000.00	\$2,500.00	\$750.00

## TOTAL MEMBERSHIP PAYMENT:

Payment Options:

- Check Enclosed

\$ \_\_\_\_\_  
(Prices effective through August 31, 2001)

**US FUNDS on US BANK**

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**DO NOT USE THIS FORM FOR RENEWALS**



# THE BLACK PEARL AWARD

RECOGNITION FOR CORPORATE EXCELLENCE IN FOOD SAFETY AND QUALITY



## Black Pearl Recipients

**2000 Zep Manufacturing Company**  
Atlanta, Georgia

**1999 Caravelle Foods**  
Brampton, Ontario, Canada

**1996 Silliker Laboratories Group, Inc.**  
Homewood, Illinois

**1998 Kraft Foods, Inc.**  
Northfield, Illinois

**1995 Albertson's, Inc.**  
Boise, Idaho

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

**1994 HEB Company**  
San Antonio, Texas

The **Black Pearl Award** is given annually to a company for its efforts in advancing food safety and quality through consumer programs, employee relations, educational activities, adherence to standards and support of the goals and objectives of the International Association for Food Protection. We invite you to nominate your company for this prestigious recognition. Contact the Association office for nomination information.

### ***Presented by***

The International Association for Food Protection

### ***Proudly sponsored by***

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**Minneapolis**

*IAFP 2001*

**88th Annual Meeting**

*Experience the  
City of Lakes*

*August 5-8, 2001*



International Association for  
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