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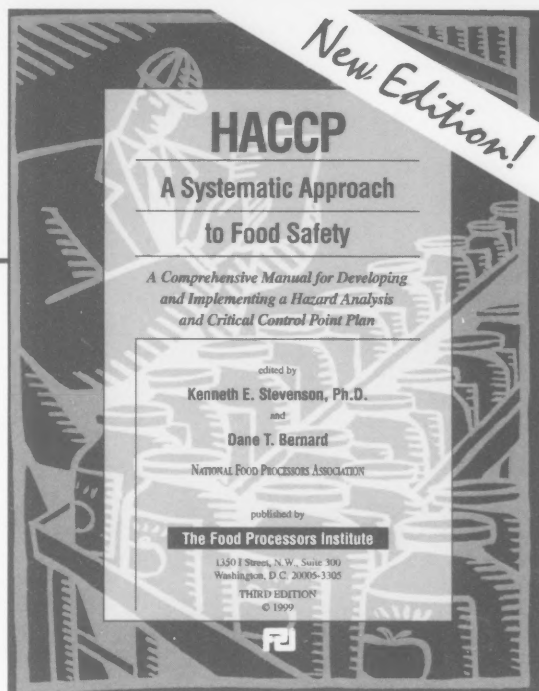
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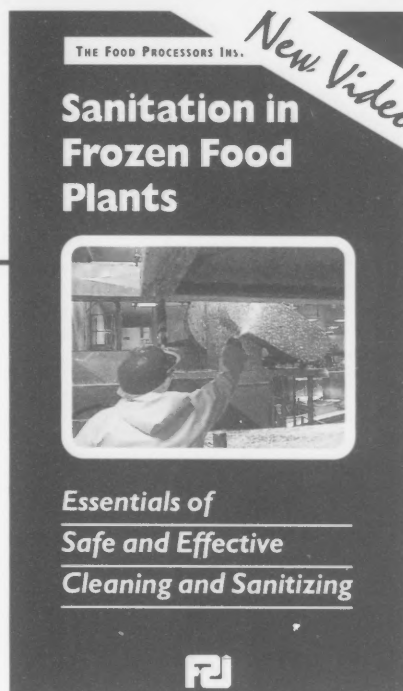
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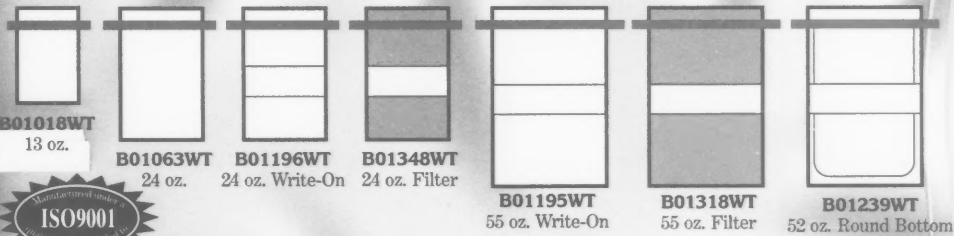
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QUOTATIONS

FROM JACK



By JACK GUZEWICH
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“Are we doing enough to attract field sanitarians to IAFP?”

It gives me great pleasure to announce Paul Hall as our newly elected Secretary. I would also like to thank Frank Yiannis for running for the Secretary position. We had two outstanding candidates, which made choosing very hard for all of us. Finally, I want to thank Dee Clingman, Chairperson of the Nominating Committee and his Committee Members, Russell Flowers, Lawrence Roth, Gloria Swick, Peter Hibbard, and Ron Schmidt for their work in selecting our nominees.

Paul will take office at the conclusion of the Awards Banquet at the 87th Annual Meeting. Beginning with the Secretary position, Paul has committed to serving the International Association for Food Protection for a five-year period serving as President in 2004. He will visit our office in Des Moines before the Annual Meeting to become oriented to the workings of the office and to meet the staff. I am sure that his commitment to the Association will be a rewarding experience!

In my December column I wrote about the need for our organization to reach out to field sanitarians. I received a reply to that column from one of our long-time Members and Past President, Henry Atherton. Henry liked my sentiments but questioned if we are doing enough to attract field sanitarians to IAFP and not just to our Affiliates. I recently returned from speaking before the Carolinas Association of Milk, Food and Environmental Sanitarians. A large percentage of the attendees at that

meeting were also IAFP Members and many of them worked in industry or milk safety and quality related jobs. So we are reaching some field sanitarians successfully. Our Annual Meeting has had several milk-related symposia as well as ones that would be of interest to field sanitarians that work in the retail area (e.g., food service and food stores). *Dairy, Food and Environmental Sanitation* publishes articles targeted to applied topics intended to appeal to field sanitarians as well. I invite readers of this column to contact me with your thoughts about how well IAFP is reaching out to field sanitarians. If we are not doing enough, how can we do better? Better yet, volunteer to take on a project that will help us meet this need. You can respond to my E-mail address jguzewic@bangate.fda.gov or to my mail address at the Office of Field Programs, HFS-605, 200 C Street S.W., Washington, D.C. 20204.

Our staff in Des Moines has been very busy preparing for our Annual Meeting. I am pleased to say that things are going well. New innovation for this year includes the ability to register online for the Annual Meeting at our Web site www.foodprotection.org. We have also added a secure online Membership Directory. To gain access to the Directory, you must type in your Membership ID and password. The password is your last name. Visit our Web site today and take advantage of these new features!

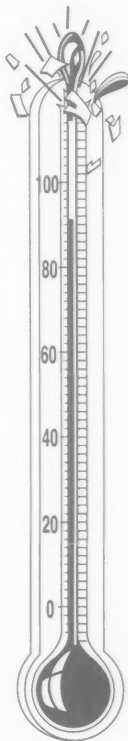
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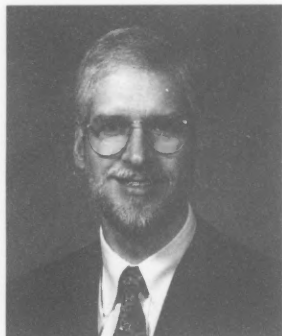


- ◆ California Association of Milk, Food and Environmental Sanitarians
- ◆ Wisconsin Association of Milk and Food Sanitarians

The above list represents individual contributors to the Association Foundation Fund during the period June 1, 1999 through March 31, 2000. In addition, a portion of the Sustaining Member dues are allocated to support this Fund. Your contribution is welcome. Call the Association office at 800.369.6337 or 515.276.3344 for more information on how you can support the Foundation.

COMMENTARY

FROM THE EXECUTIVE DIRECTOR



By DAVID W. THARP, CAE
Executive Director

“Now is the time to set your plans in motion to attend the 87th IAFP Annual Meeting”

This issue of *Dairy, Food and Environmental Sanitation* is our Annual Meeting preview issue. Beginning on page 373 you can review complete Annual Meeting information for this year's conference in Atlanta, Georgia. You can also find the most current presentation schedule at our Web site (www.foodprotection.org). While you are there, register online via our secure, online registration form. Online registration is just one of many changes implemented this year to enhance the International Association for Food Protection Annual Meeting.

The 87th Annual Meeting will be held at the Hilton Atlanta Hotel beginning August 6 and concluding August 9. Features you have come to expect from the leading food safety conference in the world continue at this year's Meeting. There are more than 300 presentations on current scientific developments in food safety and quality. This, more than ever before makes our conference the most complete forum to exchange pertinent information on protecting the food supply. Many networking opportunities during the conference allow interaction with speakers and attendees. In the exhibit hall, more than 90 companies display the latest technology advances in equipment, instruments and information to assist you in your day-to-day responsibilities.

Don't forget Committees and Professional Development Groups (PDGs) meet on Sunday so plan to arrive in time to participate. A list of our Committee and PDG Chairpersons is shown on page 370. Everyone is welcome to attend these meetings. To learn more about how

you can participate, either contact the Chairperson directly or contact our office.

Two outstanding workshops are scheduled for Saturday, August 5. The first, organized by Dr. Joseph Eifert at Virginia Tech is titled "Microbiological Sampling Plans and Sample Collection for Food Processors." "Using Information Technology to Manage Food Safety Risks" is our second offering organized by Frank Yiannas of Walt Disney World and Karen Mullery from 3M Microbiology Products. Page 392 provides additional details on the workshops.

Excellent tours have been arranged for your traveling companion to participate in. Stops at CNN, the World of Coca-Cola, Martin Luther King's Museum, the Swan House, the Carter Center and many other interesting sites are included. A very special Monday Night Social will take place at Fernbank Museum of Natural History. This facility is a magnificent new museum housing standing displays on the terrain of Georgia, collections from ancient Persia, Tibet and other exotic locations, and an educational look at the culture of the "First Georgians." The most spectacular exhibit in the museum is a display of ancient Egyptian artifacts including jewelry, mummies and pages from the Book of the Dead. This is the only city in the United States to show these world-renowned artifacts on loan from the National Museum of Antiquities in The Netherlands. Plan to be with us for this exciting evening of socializing and exploring the past!

Now for some of the new features you will find at the 87th Annual Meeting. On Saturday from 2 p.m. to 4 p.m., we scheduled an

"Affiliate Educational Session" to cover topics of interest to our Affiliate officers and delegates. The presentation will cover liability insurance, D & O insurance and insurance coverage needed when holding a meeting, conference or workshop. If you are involved with an Affiliate organization, you must plan to attend! Following the Affiliate Educational Session, an orientation for new Members and first time attendees will be held beginning at 4:30 p.m. This is an opportunity to meet the Executive Board and learn more about the Association, our Committee and PDG structure and events and sessions coming up during the Meeting. All new Members who have joined within the last year and first time attendees are encouraged to attend this one-hour, informal session.

On Sunday, a newly formed Student Professional Development Group will meet for lunch. This PDG will provide students the opportu-

nity to network with peers and will serve as a point for employers to seek qualified applicants. Anna Lammerding, Health Canada and Gale Prince, The Kroger Co., will make presentations during the luncheon. To participate in the luncheon, students should sign up when registering for the Annual Meeting. If you are not able to attend but want to be involved with the PDG, contact Scott Burnett at sburnett@cfsqe.griffin.peachnet.edu or call the Association office. There will also be a job board in the student booth located in the exhibit hall for employers to post openings and students to post resués.

With so many new and special events taking place, sometimes we lose sight of the foundation of the Meeting – the PROGRAM! On behalf of all Members and attendees, I want to thank the many, many people who agree to come to our conference to present cutting-edge information to our attendees. I also

want to thank David Golden and the Program Committee for their dedication to the Association in developing this year's program. In addition, the Local Arrangements Committee, chaired by Ed Giera, Judy Harrison, and Pam Metheny has provided excellent guidance in planning our special events. We look forward to their help during the Meeting, along with the entire Georgia Association of Food and Environmental Sanitarians.

Now is the time to set your plans in motion to attend the 87th International Association for Food Protection Annual Meeting. Review the program content, complete the registration form (don't forget, you can register online at www.foodprotection.org), make your hotel reservation (see page 390); then prepare to network with the leaders in food science, safety and quality. We look forward to seeing you in Atlanta!



NEW
FOR YOU!

The Membership Directory
is now available at
www.foodprotection.org

Members Only!!!

To access the Membership Directory, click on the "Member Directory" button on the IAFP home page and input your Member ID and password (your last name). The Directory is searchable by first or last name, company, city, state/province or country and any combination of the above categories. To send a colleague a message, just click on their E-mail address.

Go explore this new Member benefit!

(This is the first of a two-part series. Part II will run in the June issue of *DFES*.)

Reducing Transmission of Infectious Agents in the Home

Part I: Sources of Infection

Michael P. Doyle,¹ Kathryn L. Ruoff,² Merle Pierson,³ Winkler Weinberg,⁴
Barbara Soule,⁵ and Barry S. Michaels⁶

SUMMARY

Research on the microbiological flora found in the typical US household has revealed that the family home can be a center for disease transmission. Communal surfaces and materials in the kitchen, bathroom, dining area, and other shared spaces can serve as reservoirs for a wide range of potential disease-causing organisms. Improper hygiene during food preparation, toilet activities, and even laundering can lead to cross-contamination of foods, textiles, and high-traffic surfaces, potentially resulting in transmission of infective material among family members.

Although it is impossible to eliminate completely the risk of disease caused by microorganisms, much can be done to reduce the likelihood of transmission of pathogens in the home environment. HACCP provides valuable concepts for consumers who want to reduce the risk of infectious illness in their households. By identifying the locations of microbial hazards, consumers can take appropriate measures to prevent or avoid those hazards.

This paper examines the factors that contribute to illness in the home, evaluates high-hazard zones in the home environment, and reviews the evidence on methods of solving common problems of household hygiene.

THE GROWING THREAT OF INFECTIOUS DISEASE

Over the past decade, worldwide death rates due to infectious diseases have risen dramatically. In the United States, in spite of sophisticated medical facilities and a high-quality food supply, reported deaths from infectious diseases have increased by 58% since 1990. Half of this increase is due to the AIDS pandemic, whereas the other half is the result of upper and lower respiratory infections, nosocomial infection, and antimicrobial resistance (85). As shown in Table 1, an estimated 5,000 people die from foodborne illnesses each year (76), and more than 50,000 die from respiratory diseases (8, 80). A large percentage of these illnesses result from exposure to pathogens in the home.

Factors that have been associated with the rise of infections in the United States, include (3, 78, 100):

- Improper hygiene or food-handling practices of food handlers and consumers, leading to cross-contamination and interpersonal spread of disease-causing organisms.

TABLE 1. Selected illnesses reported in the US each year

Illnesses	Morbidity (estimated)	Mortality (estimated)
Foodborne illness (76)	76,000,000	5,000
Upper respiratory (80)	160,590,000	3,300
Lower respiratory & pneumonia (8, 80)	29,321,000	52,000
Pet-associated diseases (8, 52)	2,320,000	600
Allergic rhinitis (86)	47,000,000	
Vector-borne diseases & parasitic infestations (8, 19, 44)	20,100,000	400

- Increased international travel to regions where infectious diseases are endemic and migration from such regions, facilitating the transfer of pathogens across borders.
- Increased reliance on imported produce and other food, leading to increased exposure to a wide range of bacteria, parasites, and other disease-causing organisms.
- Misuse and overuse of antibiotics and antimicrobials, which can foster the development of resistant strains that pose a greater threat to health than their predecessors.

The need for more effective preventive measures is particularly pressing in light of the recognition of strains of disease-causing microorganisms that are atypically resistant to environmental stresses and antibiotics. Viruses, bacteria, and other microorganisms are remarkably adaptable. In recent years, some bacterial pathogens have become resistant to the effects of several common antimicrobials. At present, resistance to penicillin is increasing in the bacteria that cause pneumococcal pneumonia, a leading cause of death in children and the elderly (16). Increased antibiotic resistance also has been documented in: *Enterococcus faecalis* and *E. faecium* (66, 109), *Escherichia coli* (48, 66),

Pseudomonas aeruginosa (66), *Acinetobacter* spp. (66), *Haemophilus influenzae* (15, 66), *Shigella dysenteriae* (66, 109), *Neisseria gonorrhoeae* (66), *Mycobacterium tuberculosis* (66), *Salmonella* Typhimurium DT 104 (4, 47), *Campylobacter jejuni* (75), *Staphylococcus aureus* (18, 66), *Salmonella* Enteritidis (105), and *Yersinia pestis* (42).

As more and more pathogens become resistant to measures commonly used to control them, the need for primary prevention – prevention through reduced exposure – will become even more important.

SOURCES OF INFECTION

Disease-causing organisms make their way into the home through a wide variety of routes. Food, animals, insects, and humans all can be carriers of potential pathogens (6, 20, 32, 37, 54, 114). Recognition and understanding of the sources and modes of transmission of microorganisms that can cause illness is critical to preventing or interrupting the spread of disease within the home.

Human pathogens

Numerous potential disease-causing microorganisms occur in and on the human body. There are several microhabitats associated

with the human body, and each of these habitats contains a group of microorganisms that have adapted to that specific environment. In healthy individuals, these organisms generally are harmless and are considered normal resident flora. Notable exceptions to this rule are some of the organisms associated with the gastrointestinal tract, respiratory system, and skin (6).

Gastrointestinal tract

More than 300 species of bacteria are commonly found in the human gastrointestinal tract or feces (79, 83). Although most of these bacteria are either helpful or harmless, many can cause illness when transferred to other body environments, such as the eyes or genitourinary tract. In addition, the GI tract can be colonized by pathogenic organisms that are easily spread via the fecal-oral route.

Each person sheds an estimated thirty trillion bacterial cells daily through feces (83). Of the dozens of disease-causing microorganisms and viruses known to be spread via human feces, hundreds of thousands of persons in the United States are at any given time, excretors of *Salmonella*, *Shigella*, and pathogenic *E. coli* (26). Although this number may be small in percentage terms, human-to-human transmission, transmission via contaminated food and water, and other modes of transmission can cause illness in a large number of individuals (68).

Respiratory tract

The respiratory tract is an important source of infectious agents in the household environment. In illnesses such as the common cold, respiratory discharges rich in infectious material are very effectively distributed via coughing and sneezing (1, 31). A single sneeze, for example, can produce up to 10,000 airborne droplets, traveling at initial velocities of over 200 miles per hour and propelled up to 3 feet (55). On skin, handkerchiefs, clothing, or common surfaces, the infectious material in these droplets is pro-

TABLE 2. Percentage of US adults who consistently wash their hands

Study	Hospital					Commercial Food Preparation		Public Restrooms	At Home	Public Schools M,F*				
	Reference Nos.	Physicians	Nurses	Resp. Ther.	Radiology	Other	Food Service	Food Process	M,F*		Elem.	Middle	High	
56									40					
107			38											
2		21	36	62	35	22								
87			30											
58		19	63			25								
35							40							
49			39											
99			22											
69		49												
89		38	54											
45		40												
46			50											
77		18	58											
115		35	33	25	30	20								
112		31	69		35	90								
47		39	39											
34										44				
51												55, 46	60, 50	
60								59, 81						
27									43					
Average		32	44	44	33	39	40			60, 78	42	44	51	55
Group Average				38			40			69	42		50	

*M, F=Male, Female

tected from destruction by secretions such as mucus or sputum, allowing them to remain viable for extended periods of time (20, 70, 102).

Skin and mucous membranes

In healthy individuals, the skin usually serves as an effective barrier against pathogenic organisms (54, 65, 113). However, pathogens on moist skin surfaces can easily be transmitted to people, food, liquids, communal surfaces, or other regions of the body. For example, when toxigenic *Staphylococcus aureus* from the nose joins the normal skin population, the risk for contamination of food during the course of food preparation increases (78). When these organisms subsequently multiply within a food, they produce a disease-causing toxin that is resistant to heat (7).

Hazard reduction methods

Preventing or reducing the transfer of pathogens from colonized or infected individuals to other people, to surfaces, and to food can

greatly reduce the likelihood that illness will be acquired in the home. Hazard reduction methods such as careful attention to proper handwashing, toilet hygiene, and food handling practices appear to be lacking among many modern consumers (27). As illustrated in Table 2, studies of handwashing compliance in various settings indicate that only 40% to 60% of adults consistently wash their hands when appropriate.

Proper handwashing is one of the most effective means of preventing the spread of infection, in the home or anywhere else that infection control is important (14). CDC outbreak data from 1988 to 1992 indicate that poor personal hygiene practices were the second most frequently reported factor associated with foodborne illness outbreaks (17).

Research has shown that the average time required for a thorough washing is approximately 30 seconds. Yet, on average, most people take only 10 seconds to wash their hands (7, 62, 72, 77). This number is based on reports that included healthcare workers, and it is there-

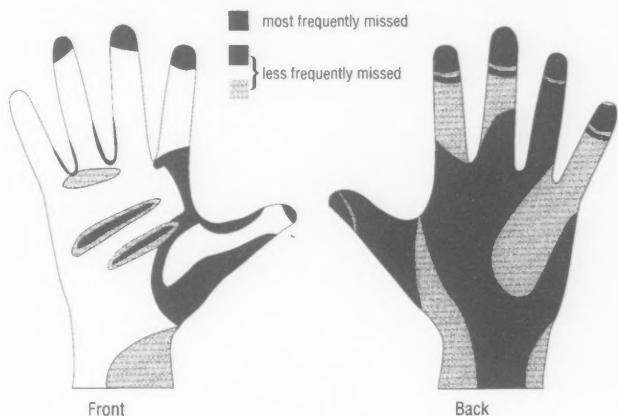
fore likely to be an overestimate. In reality, some people spend little more time than would be required to rinse their hands quickly under the faucet (29, 88).

Even with thorough handwashing, many areas of the hand, notably the fingers and fingertips, are routinely missed, as shown in Fig. 1 (107). Unfortunately, these areas are among the most likely to harbor and transfer potential pathogens (73); most bacteria on the hands exist on or around the fingernails, an area from which microbial removal is difficult (23, 77, 91, 101). Organisms isolated from these subungual spaces include *Staphylococcus epidermidis*, *S. haemolyticus*, *S. hominis*, and *S. aureus*; *Pseudomonas* sp.; *Serratia* sp.; *Proteus mirabilis*; *Citrobacter freundii*; *E. coli*; *Enterobacter cloacae*; *Klebsiella pneumoniae*; *Candida parapsilosis*, and *C. albicans* (53).

Considerable research has determined the optimal handwashing technique for removing bacterial and other contaminants from the hands (33, 61, 88, 98). Efficient handwashing requires adequate fric-

Figure 1. Distribution of areas missed during handwashing

DISTRIBUTION OF AREAS MISSED DURING HANDWASHING



Reference: Taylor, L. J. (107)

tion during the handwashing process, complete and thorough drying, and avoidance of recontamination after completion of handwashing.

The degree of dryness is important because moisture on the skin encourages the growth of microflora and can change the ratio of resident to transient flora, as moist hands can transfer more microorganisms than can dry hands (71, 74, 82). Communal towels have been implicated in transfer of microorganisms in respiratory disease in the United States and elsewhere and use of a contaminated towel will render even the most thorough washing moot (93, 95). In contrast, single-use paper towels are highly sanitary, both because the paper-making process substantially reduces or eliminates microorganisms (5, 67, 95, 108) and because the use of paper towels offers distinct advantages over cloth towels in preventing transmission of organisms. Compared with cloth towels, paper towels provide greater friction, making them more efficient at removing microorganisms, particularly from on and between the fingers (10). In actual-use studies, paper towels used

after handwashing were shown to produce significantly greater reductions in resident flora on hands than did cloth towels (10, 11, 61, 89).

In addition to physically removing bacteria during hand drying, paper towels can help reduce the risk of cross-contamination after hands have been washed. Paper towels (used or fresh) can be employed to turn off faucets and grip restroom door handles, avoiding recontamination of the hands (10, 11, 24, 25, 63, 90, 98). Proper handwashing with an antimicrobial soap and drying with paper towels has been shown to provide up to a 3 log reduction of transient microbial contamination (43, 81, 84).

Foodborne pathogens

Foodborne pathogens continue to be an important health threat in the home. Along with restaurants and other food-service outlets, the home is one of the most frequent sites of contamination by foodborne pathogens (110). Current estimates indicate that between 32% and 80% of foodborne illness outbreaks originate in the home (30, 96). Given that epidemiologists believe that outbreaks are underreported, perhaps

by a factor as high as 250, and that sporadic cases that occur in the home are commonly not reported, probably more than 50% of foodborne illnesses result from exposure to pathogens in the home (7, 12, 106).

Recognition of the home's importance in foodborne disease transmission has been heightened by recent outbreaks of severe illness caused by microorganisms such as *E. coli* O157:H7 in undercooked beef patties prepared in the home (75). Disease-causing organisms have been identified in a wide range of food products found in the home, including fresh produce and raw poultry and meats; at least 10 genera of microbial pathogens have been implicated in seafoodborne illness (67).

Hazard reduction methods

Improper holding temperatures, inadequate cooking, and poor personal hygiene on the part of food handlers are among the most important contributors to the spread of foodborne disease (22). Fortunately, applying relatively simple measures in the home can greatly reduce the likelihood of foodborne illness.

- To prevent growth of foodborne pathogens during storage, refrigerate or freeze all perishable prepared foods and leftovers within two hours. When storing leftovers, place large amounts into a number of small, shallow containers to facilitate quick cooling in the refrigerator. Maintain the refrigerator at 40°F or below and the freezer unit at 0°F or below. When using frozen foods, do not defrost (or marinate) food on the kitchen counter; use the refrigerator, cold running water, or the microwave oven.
- Cook food thoroughly to kill microbes that may cause foodborne illness. Roasts should be cooked to an internal temperature of at least 145°F, ground beef to at least 160°F,

and turkey to at least 180°F. Use a meat thermometer to ensure that these products are cooked all the way through. Fish should be cooked until the flesh is opaque and flakes easily with a fork, whereas eggs should be cooked until both the yolk and white are firm. When using a microwave oven, stir and rotate food to prevent cold spots in which bacteria may survive. Always reheat leftovers to at least 165°F, and bring reheated sauces to a rolling boil.

- To prevent cross-contamination during food storage or preparation, keep raw meat, poultry, and seafood away from produce and pre-cooked or ready-to-eat foods, and store them on the bottom shelf of the refrigerator so that juices do not drip onto other foods. Never place cooked food on an unclean plate that previously held raw meat, poultry, or seafood. A clean, wide plate lined with absorbent, disposable paper towels can be used under the raw meat or poultry. When working with these items, wash hands, cutting boards, knives, utensils, and counter tops with hot, soapy water before moving on to other food items.
- To help remove pathogens on produce, wash all fruits and vegetables thoroughly prior to consumption or use. Some experts advise that leafy vegetables such as lettuce should be washed leaf by leaf to ensure better cleaning (28).

Pets and pests

Animals, whether domestic or wild, are a common source of exposure to a wide range of disease agents (57, 104). Animal-associated disease can be transmitted in various ways, including excreta, respi-

ratory secretions, and bites and scratches involving saliva (57, 104).

Of all pet-associated pathogens, *Toxoplasma gondii* is the most widespread. Toxoplasmosis can be acquired through contact with feces of infected cats, but it also can be transmitted via food. Approximately one-fourth of adults in the United States are seropositive for *Toxoplasma* (8). Cats acquire the infection through ingestion of infected rodents or birds that carry the disease-causing organisms (6), and 1% are excretors of *T. gondii* oocysts at any given time. Although toxoplasmosis infection is fairly common and not considered serious, complications can arise if a pregnant woman passes the parasite on to her fetus (113).

Insect pests have been implicated in transmitting in the home microbial pathogens responsible for a small number of outbreaks of foodborne illness. For example, the housefly, *Musca domestica*, has been shown to be able to transmit in hospital and domestic environments many potentially pathogenic microorganisms including *Chlamydia trachomatis*, *Campylobacter* spp., *Shigella* spp., *Pseudomonas aeruginosa*, Viridans streptococci, *Staphylococcus aureus*, *Klebsiella* spp., *Yersinia enterocolitica*, *Salmonella* spp., *Escherichia coli*, *Helicobacter pylori*, *Vibrio cholerae*, *Toxoplasma gondii*, and rotavirus (9, 13, 21, 36, 38-41, 50, 64, 94, 97, 104, 111).

Hazard reduction methods

Because of the health hazard associated with cat feces, litter boxes should not be kept in the kitchen or in close proximity to infants or infant-care areas. Care should be taken during litter cleaning and removal to prevent dissemination of potentially infectious material into the surrounding environment, and hands should be washed thoroughly following contact with used litter. High-risk individuals, particularly pregnant women or people infected with HIV, should avoid cleaning a litter box (59, 92).

To prevent transmission of pathogens from pets to children, it is important to monitor all interactions between pets and young children (57). Children should be taught to wash their hands immediately after playing with pets, and both adults and children should take particular care in washing hands after handling reptiles or amphibians, as these animals are frequent excretors of various *Salmonella* species. Hand-to-mouth or hand-to-eye contact should be avoided until after hands have been washed thoroughly.

Because many parasites can be transmitted from animals to humans, every effort should be taken to prevent parasitic infection or infestation of house pets. Dogs and cats should be wormed regularly and treated to prevent flea infestations (57). Pets with known infections, such as ringworm, should be kept isolated from other pets and from human members of the household until the condition is resolved, and those who care for sick pets should be particularly scrupulous about handwashing. Surfaces that have been contaminated with animal fur, droppings, or vomitus should always be thoroughly cleaned and disinfected.

In the event a pet breaks the skin – either with teeth or claws – the wound should be cleaned thoroughly. For small, superficial wounds, a thorough cleaning may be sufficient. Larger wounds, however, should be treated with an antiseptic and covered with a bandage to prevent infection. Severe bites involving deep punctures should be addressed through appropriate medical attention, as should any pet-inflicted wound that shows signs of infection (103, 115).

CONCLUSIONS

The first line of defense in preventing disease transmission is effective handwashing (14, 59). Hand drying, a critical step in this hygiene process, is important in reducing the likelihood of microbial contami-

nation or transmission of other agents that can cause family illness. Because communal towels can be contaminated with disease-causing microorganisms, single-use paper towels can enhance the hygienic efficiency of handwashing.

Household sanitation involves every aspect of family life, every room, and every household member. Use of effective measures to reduce contamination with pathogens can, in many instances, prevent disease transmission among family members. Thus, through preventive sanitation and other good hygiene practices, chains of contagion can be broken.

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Evaluation of the Sanitation Program at a Baking Facility for Production of a Low Acid, Fruit-based, Shelf - Stable Product

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SUMMARY

The sanitation program at a baking facility was evaluated to assess whether it met the requirements for producing a shelf stable product. Testing was conducted during the sanitation shift. The evaluation included an extensive tour and review of the facility, as well as the monitoring of several test points in the facility by use of both an ATP bioluminescence hygiene monitoring system and microbiological surface swab tests.

Test results and observations made in the plant revealed areas and practices that constitute a risk to the microbial stability of the product. Recommendations were made to improve the cleaning and sanitation program in order to reduce the risk of microbiological contamination and protect finished product quality. It was concluded that the sanitation program must operate effectively and consistently if the facility is to be successful in producing microbiologically sensitive products.

INTRODUCTION

Food residue left on the surface of equipment and in the processing plant environment provides nutrients for the rapid growth of bacteria, yeasts, and molds. Bacteria multiply exponentially; one cell becomes two in approximately 20 minutes in warm moist conditions (4), so even a low initial level of contamination (e.g., 100 cells/100 cm²) on a piece of equipment can become a serious problem by the end of a production shift. Once microorganisms become attached to a surface, they form a base layer that grows into a biofilm (a film of bacteria and food residue). Bacteria that have adhered to equipment at the bottom of the biofilm are difficult to remove. However, cells at the top of the biofilm easily slough off, contaminating the food product (2).

In a shelf stable product, the water activity and pH are precisely adjusted to inhibit the growth of the usual types and numbers of microorganisms associated with the food. Unhygienic processing conditions lead to a greater microbial load and an increased diversity in the initial

contamination. An increased microbial load in the product increases the risk that the inherent water activity and pH combination will not be effective in controlling microbial growth (6). An effective cleaning/sanitation program is the only way to prevent biofilm formation and ensure a consistently low initial microbial load in the final product (8). The objective of this study was to evaluate the sanitation at a baking facility and determine if changes were necessary for production of a safe shelf stable product with low initial microbial counts.

MATERIALS AND METHODS

The production facility was visited unannounced on three separate occasions during the cleaning and sanitation shift. Surfaces identified as potential areas of concern were sampled after cleaning and sanitation, using the IDEXX Lightning™ cleaning validation system and microbiological surface swabs.

ATP bioluminescence assay

The IDEXX Lightning™ Cleaning Validation system was obtained from IDEXX Laboratories, Inc. (Westbrook, ME) (3). The luminometer was calibrated according to manufacturer's instructions before use. A 100 cm² area was swabbed in a zig-zag pattern in two opposite directions while the swab was rotated. The samples were assayed for ATP according to the manufacturer's instructions, and the reading was taken immediately after swabbing. Control assays were conducted by the procedure just described, using fresh, unused swabs. Blank readings of any background light outputs were recorded by taking light readings in the absence of any reagents.

Plate count assay

Sterile cotton wool swabs (Fisher Scientific, Pittsburgh, PA) were used to swab the chosen surfaces. The swabs were pre-moistened in sterile D/E Neutralizing Broth (Difco Laboratories, Detroit,

MI) before sampling. A 100 cm² (10 cm × 10 cm) area of the test surface was swabbed in a zig-zag pattern in two opposite directions while the swab was rotated (1, 5). The swab was then returned to the plastic test tube, which contained 10 ml of D/E neutralizing broth, and refrigerated (7). The refrigerated sample was analyzed within 24 h of sampling. The swab in the test tube of diluent was agitated by vortexing for 10 s, to remove microbial cells from the swab. The resulting diluent was spiral plated onto Tryptic Soy Yeast Agar (TSY), Violet Red Bile Agar (VRB), and Lactobacilli MRS Agar (MRS) (Difco Laboratories, Detroit, MI), by use of a Model CU spiral plater (Spiral Systems, Inc., Cincinnati, OH). The inoculated TSY plates were incubated at 30°C for 48 h, and the VRB plates were incubated at 37°C for 24 h. The MRS plates were incubated in anaerobic jars (Gas Pak system; BBL) at 30°C for 48 h.

Coliform identification

Colonies with presumed typical coliform morphology on VRB agar were sampled and streaked for purification on TSY agar. Pure cell suspensions were subsequently prepared and transferred to Analytical Profile Index (API) 20 E strips (BioMérieux, Hazelwood, MO) according to the manufacturer's instructions. The strips were incubated at 37°C for 24 h. The reagents used for the biochemical reactions were obtained from bioMérieux (Hazelwood, MO). Colonies on the purity plates were also tested for the catalase enzyme with 3% hydrogen peroxide. A positive reaction was indicated by gas production. Gram stains were conducted using the Bacto 3-Step Gram Stain Set T, the traditional iodine technique (Difco Laboratories, Detroit, MI).

Additional observations

Visual assessments were made on 3 separate occasions while the plant survey was being conducted. Observations of employee practices, plant condition, sanitation proce-

dures and product handling were recorded, as well as concerns and suggestions for improvements expressed by plant employees and shift supervisors.

RESULTS AND DISCUSSION

Observations made during the sanitation survey, concerns expressed by employees, and results obtained from the ATP bioluminescence assay and plate count assay were used in formulating recommendations to improve the hygiene in the production facility. The main areas of concern were determined to be the frequency of cleaning and sanitation, the lack of consistency, the microbial level on the pails used to store ingredients, the shortage of time for completion of the tasks, and the lack of high pressure, hot water.

Consistent execution of sanitation procedures is as important as the frequency at which cleaners and sanitizers are used. Inconsistent use of cleaning agents and sanitizers allows microbial "hot spots" to form, as seen in the sanitation survey results in Table 1. A surface passed if it scored less than 2.5, was in the warning zone if between 2.5 and 3.0, and failed if the score was 3.0 and above, when measured with the ATP bioluminescent cleaning validation system. A surface failed if it scored greater than 100 CFU/100 cm² when the traditional microbiological surface swabs were used. In the "mixing room" for example, 55% of the surfaces sampled failed or were in the warning zone. Two microbiological samples were as high as 1.0×10^5 CFU/100 cm². Hot spots were also identified on the production line, where 3 of the 8 microbiological swabs had counts over 1×10^4 CFU/100 cm². More vigorous cleaning may be required for complete removal of the food residue left on the surface after production. Sanitation procedures must be executed to the same standard every shift in order to eliminate "hot spots" and produce a safe, shelf-stable product.

TABLE 1. ATP bioluminescence and microbiological surface swab assay results from 3 visits to the production facility

Location	Equipment	ATP bioluminescence (Log RLU/100cm ²)	APC (CFU/100cm ²)	Total coliforms (CFU/100cm ²)	Lactic acid bacteria (CFU/100cm ²)
Mixing room					
	Egg cracker	3.2	8.1 × 10 ²	<100	<100
		2.7	<100	<100	<100
		2.4	1.0 × 10 ⁷	2.6 × 10 ⁵	<100
	Large glen bowl	2.6	7.3 × 10 ³	<100	1.3 × 10 ³
		3.2	6.5 × 10 ³	<100	<100
	Ribbon blender	3.0	2.1 × 10 ³	1.1 × 10 ²	<100
		3.3	5.4 × 10 ²	<100	<100
		2.8	7.6 × 10 ²	<100	<100
	Table	2.6	9.8 × 10 ²	1.1 × 10 ²	<100
		2.6	5.6 × 10 ³	<100	<100
		4.2	1.1 × 10 ⁴	6.5 × 10 ²	<100
Wash-up room	Pails	3.6	1.2 × 10 ⁴	1.5 × 10 ³	3.9 × 10 ³
		2.4	1.2 × 10 ⁴	4.3 × 10 ⁴	1.6 × 10 ⁴
		3.7	7.7 × 10 ⁵	5.5 × 10 ⁵	2.6 × 10 ⁵
Outside storage	Pails	3.1	2.3 × 10 ⁵	<100	5.3 × 10 ⁴
		4.4	3.7 × 10 ⁵	<100	2.3 × 10 ³
		3.7	7.2 × 10 ⁵	3.7 × 10 ⁵	3.8 × 10 ⁵
Pie line	Pastry conveyer	2.8	3.0 × 10 ³	<100	4.0 × 10 ²
		2.6	9.4 × 10 ⁴	2.2 × 10 ²	9.2 × 10 ⁴
		3.1	3.9 × 10 ⁴	<100	1.6 × 10 ⁴
	Series 90 conveyer	3.7	1.4 × 10 ³	7.6 × 10 ²	<100
		2.5	2.2 × 10 ²	<100	3.3 × 10 ²
		3.5	4.3 × 10 ²	<100	5.4 × 10 ²

The pails used to contain frozen fruit and store pre-mixed ingredients were identified as the largest risk to product safety and quality. Pails, even after already having been washed, failed consistently. Of great concern was the presence of coliform bacteria in numbers as high as 5.5×10^5 CFU/100 cm² (Table 1). Coliform bacteria are susceptible to hot water and sanitizers, and their presence therefore indicates poor sanitation control of these potential pathogens (4).

The suspect coliforms recovered from the pails on VRB agar were Gram stained, tested for catalase and identified by use of Analytical Profile Index (API) 20 E strips (bioMérieux, Hazelwood, MO). The colonies were Gram-negative, catalase positive, rods. An "excellent identification" of *Enterobacter cloacae* was obtained with the API strips. *E. cloacae* produces a heat-stable enterotoxin and has been associated with outbreaks of gastroenteritis (4).

Lactic acid bacteria in high numbers were also recovered from the pails. Lactic acid bacteria are spoilage microorganisms. The microbiological and ATP bioluminescence results indicated that the pails were a serious source of contamination that could impact product shelf life and safety. On the basis of this potential hazard, it was recommended that the pails be washed thoroughly and sanitized before every use. Use of a detergent and sanitizer in the pail washer would remove food debris and control microorganisms. It was also recommended that the practice of storing the pails outdoors be stopped, because outdoor storage exposes items to environmental contamination that could end up in the final product.

Microbial load variations in the finished product may result from poor sanitation control. For example, surfaces in the mixing room had been sanitized as infrequently as once a week. The current method of using high-pressure hot water alone does not control the microbial load that eventually ends up in the

food product. To ensure the initial microbial level is consistently low, all food contact surfaces should be sanitized every sanitation shift. The cleanup sequence should begin immediately after a piece of equipment is used, by dismantling and exposing surfaces for cleaning as much as possible and then flushing the equipment with water to remove food residue. The cleaning/sanitation crew must then apply the necessary detergents, scrubs, and rinses and then sanitize the equipment.

It was noted and stated by sanitation employees that they were not given enough time to complete their tasks properly or clean and sanitize all the items on the schedule. This inadequacy may contribute to the inconsistencies noted previously. When time for sanitation is insufficient, plant cleanliness seriously declines. Insufficient time to clean and sanitize completely allows for biofilm formation, jeopardizing the microbial stability of the product during the next production shift. Increasing the number of employees would help to ensure that equipment is cleaned and sanitized before production begins.

Employees need the correct tools to do the job. Therefore, the use of top quality cleaning materials and equipment is necessary. High-pressure hot water is a critical tool in cleaning and sanitation. Food residues are difficult to remove under the best conditions; under the existing program, the hot water had been known to turn lukewarm halfway through the sanitation shift, and the pressure was often not sufficient to remove debris effectively. It was recommended that adequate infrastructure be put in place so that sanitation employees have hot water at the required temperature and pressure for the entire shift. The water temperature needed depends on the task being performed.

The following recommendations were made for improving the cleaning and sanitation program to reduce the microbial load in the shelf stable product and to ensure that the inherent hurdles would be dealt with effectively:

Eliminate potential sources of contamination

1. Using a sanitizer in the pail washer before stacking should properly sanitize pails.
2. Pails should be stored indoors, away from environmental contaminants and pests.
3. An appropriate detergent should be used in the mixing room for more efficient removal of food residue from the equipment.
4. The equipment in the mixing room should be sanitized every sanitation shift.
5. Non-food contact surfaces (e.g. walls) should be cleaned regularly.
6. Product-soiled equipment should be pre-rinsed as soon as possible after it is used.

Adequate tools and training

7. Adequate infrastructure should be in place so that sanitation employees have hot water at high pressure for the entire shift.
8. Sanitation crew should be given enough time to complete all tasks before production begins.
9. When the facility is running with three shifts, the number of people on the sanitation crew should be increased to meet the increased workload.
10. All sanitation employees should be trained in Good Manufacturing Practices (GMPs) and sanitation control.
11. Sanitation procedures should be documented and made available to sanitation employees.
12. The thoroughness of plant and equipment cleanup should be monitored and recorded regularly using a rapid technique, such as an ATP bioluminescence system.

Improvements in employee practices

13. Finished product should be cooled in an area physically separated from the production floor to avoid cross contamination.
14. Hand dip stations should be maintained in working order and their frequent use encouraged.
15. Supplies and finished product should be covered or, preferably, removed from the cleanup area.
16. A regular plant cleaning/sanitation schedule should be kept and followed.
17. All plant employees should be given the responsibility for general cleanliness in and about their various activities in the plant.

In conclusion, if the recommendations are followed consistently and the sanitation program is executed

effectively, the microbial load in the finished product will be maintained at a low level. This will enable the facility to successfully produce a shelf stable product by ensuring that the inherent water activity and pH combination will be effective in controlling microbial growth.

ABOUT THE AUTHORS

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Congratulations



In March of 2000, the International Association for Food Protection participated at the International Fresh-Cut Produce Association's 13th Annual Conference and Exhibition in Dallas, Texas. While exhibiting, we offered two drawings for a one-year Membership with our Association and one 87th IAFP Annual Meeting Registration. We are pleased to announce the following winners of the drawing:

William J. Perry, Los Angeles, California
Winner of a one-year IAFP Membership

Wilfred A. Sumner, Oakland, California
Winner of a one-year IAFP Membership and
an 87th IAFP Annual Meeting Registration

We hope these new Members find their Memberships rewarding.

Reflections from the Past

Presidential Address

Roy Ginn

74th Annual Meeting of the International Association
of Milk, Food and Environmental Sanitarians, Inc.
August 2-16, 1987
Anaheim, California

What does IAMFES mean to you? To me it means a learning experience. Over the years I have learned about *Listeria*, biosensors, *Salmonella*, sanitation, water quality, milk and food quality, etc., but, most of all, I have learned about people and their professions. IAMFES is made up of scientists, educators, managers, business owners, sanitarians, technicians, farmers, writers and salesmen, etc. The name of our organization is a mouthful, but it does accurately suggest most of the disciplines in which you are employed. The Association is exciting, interesting and fun, and after you have been here as long as I have, it is like a family. I have enjoyed this association, serving on the Board, and now as your President.

Speaking of people, I would like to single out a long-time Member, who has served this association faithfully for many years. He has been Editor of the *Journal of Food Protection* for twenty years. Dr. Elmer Marth, University of Wisconsin, is retiring as Editor of the *Journal of Food Protection* this year. Dr. Marth has given so much of himself to make the Journal successful, and I would say we have one of the finest journals in this country. It is people like Dr. Marth that make this Association so great and successful. Thank you Elmer, for all of those devoted years.

I would like to welcome Bob Sanders to the Board of Directors of IAMFES. Bob will become the Secretary of

the Board on Thursday morning. Bob is with FDA in Washington, D.C., and has been a long-time Member of IAMFES.

The Board has made a real effort this year to strengthen our Committees. We want active and busy Committees so that each of you will have a place to contribute to our common goal of food and environmental protection. We have had some Committees which are in name only. If we are going to tolerate that because of indifference, or maybe, it looks good on the program, then we are not providing education and information, therefore, not serving our Members.

All Committees must have a purpose and a goal and a plan to accomplish that goal. We have many such Committees in our Association that have accomplished their goals and are looking at new goals. To help strengthen our Committees and get new ideas, the Board met with Committee chairpersons this morning for a breakfast meeting. Note in your program that we have provided time for Committee chairpersons to give these reports during the various sessions. Our hope is to provide information to the people who are interested in that discipline. I have been at many of our business meetings where we raced through Committee reports so we could make the bus for our evening social time. This is one of the reasons we have tried to change the format. Many Committees have given their time and effort to give information to help you in your profession. It is only decent and

in order, that we provide them the forum to present this information. I would also encourage Committees to have a publishable report so it could be published in one of our Journals, therefore being useful to a larger audience.

You will note in your program that we have added several new Committees. Our Vice President, Dr. Gravani, has worked very hard this past year to encourage and nurture chairpersons to look at their goals and objectives.

At our business meeting today, we will be voting on proposed amendments to the Constitution and Bylaws. Our Sustaining Membership is growing and we are proposing a new section in the Bylaws on Sustaining Members, as there is also a proposed section on Retired Members. These are important changes, and I encourage you to attend the business meeting and voice your opinion.

Last year, the Board approved table top exhibits at our Annual Meeting. The purpose was to provide another format to present information. The exhibits should be educational in nature. We had 27 exhibitors and the effort was successful, so this year, the Board voted to expand the number of exhibits. We have limited them to table top exhibits, as we are not trying to compete with equipment-type trade shows. I would encourage this policy be guarded in the future.

So that the goals and directions of this Association stay on course, the Board authorized a Long Range Planning Committee. This committee will be chaired by Dr. Mike Wehr from Oregon. We want this Committee to look at our Journals, Committee structure, and our Annual Meetings and make recommendations to the Board as to the direction this Association should take to better serve our Membership and expand our Membership. This is the first time this Association has had a formal Long Range Planning Committee.

This Association is alive, well and growing. The Membership has increased 523 and at least 300 of these can be credited to the efforts of the Membership Department and telephone marketing at Ames. As of July 1, 1987, we have 4,121 Members. We have 78 Sustaining Members and 32 of these were added this year by the staff. Look at the list of Sustaining Members in the front of the Journal. This is a fantastic effort by our staff. Congratulations! We are proud of your good work.

We mailed 631 more *Dairy and Food Sanitation* Journals this year over last for a total of 3,095 Journals. This year is the 50th anniversary of the *Journal of Food Protection*. We send out 435 more copies for a total of 3,142. What a nice anniversary present. We are growing!

Kathy Hathaway, our Executive Manager, and her staff have been distributing our Journals at trade shows to let them know IAMFES has something educational to offer professionals in food protection. We all should be proud that this is the 50th anniversary of the *Journal of Food Protection*.

The advertising department has surpassed their goal of \$100,000 net advertising sales by \$6,000.00.

We have had to expand our office space, add staff and have installed a new phone system. There are always growing pains, but, if we are to serve the Membership, we need adequate facilities.

The Board has authorized an audiovisual lending library, and this will require space and personnel to manage. This is being supported by our Foundation Fund. The Library Management Committee, chaired by Past

President, Sidney Barnard, has been reviewing slides this year, to get this lending audiovisual library functioning. This is another way to educate people, but it requires money, space and time. We need people to serve, so, if you are interested, let us know.

A pleasant task for me this past year was to sit on the jury of the Crumline Award. This is a prestigious award, given to an outstanding health department. The presentation of the award is rotated between IAMFES, APHA and NEHA meetings. The presidents of these associations sit on the jury with others. The Single Service Association, represented by Charles Felix, sponsors this Award. I encourage more health departments to enter this competition. Our Board has been looking at updated guidelines for IAMFES awards. There are many deserving people in our Association so please take some of your time and nominate them and send in their biographies to the Awards Chairman. Who knows—the individual could be you!

This is the second year for our graduate student papers with the best papers receiving a monetary award. We want these young scientists in our Association as they are our future.

In the past few years, we have been struggling to come up with the correct meeting sites for our Annual Meeting. It is very difficult for the Board to turn down an Affiliate who would like to host an Annual Meeting, but there are several considerations which must come into play, such as a hotel with adequate number of sleeping rooms, meeting rooms, space for exhibitors, and adequate air transportation. This will be one item for the Long Range Planning Committee to discuss. As our Association grows, we will find there are fewer sites which can house our Annual Meeting. This is a new challenge which all Affiliates and the Board will have to deal with in the future. From the other side of the coin, growth is a pleasant problem. I am pleased to announce that we have a new Affiliate in our Association. It is the Georgia Association of Food and Environmental Sanitarians, Inc. Welcome aboard!

Leon Townsend, Program Chairman, and his Committee have come up with an outstanding program this year. In the next two days, you have the opportunity to choose from twelve different sessions. Three Food Protection Sessions; Three Milk Sanitation Sessions; Symposium on Food Tampering and Protective Packaging, on Biosensors and Their Potential Use in Food Microbiology, and on Water Quality; A Food Service Sanitation Session; an Environmental Protection Session; and a Session on *Listeria* and Emerging Pathogens. Hopefully, you will find something which will be of interest to each of you in these sessions. Be sure to take some time to visit the exhibits.

The California Affiliate has done an outstanding job in making your stay a pleasant one. I take a risk in singling out one person, however, Austin Olinger has put in many hours of effort to make this a successful meeting. Thank you, Austin, and your Committee. While you are here in California, take advantage of the various tours which have been provided. Thursday be sure to take in the California large dairy herds tour. This is a beautiful part of the country. I hope you and your families have a pleasant meeting.

Reprinted from *Dairy and Food Sanitation*, Vol. 7, No. 11.

Presidential Address

Robert B. Gravani

76th Annual Meeting of the International Association
of Milk, Food and Environmental Sanitarians, Inc.

August 13-17 1989
Minneapolis, Minnesota

I would like to provide all IAMFES Members with a report on the current status of our Association.

Association Management — This year has been a very productive but slightly unusual one in that our Executive Manager Kathy Hathaway, resigned and moved to Clinton, OH. Your Executive Board then began a search for a new Executive Manager. We received 65 applications for the position and carefully screened all of them.

After interviewing five qualified candidates in Ames, the Board discussed the merits of each of these individuals and chose Mr. Steven K. Halstead as the new Executive Manager of IAMFES.

We are pleased to have Steve as our new Executive Manager. I hope that you will join the Executive Board in welcoming Steve to IAMFES and assist him as he learns about our Association.

During the two months between Executive Managers, Ms. Margie Marble did an outstanding job in serving as Acting Executive Manager. She, along with the entire Ames office staff (Sandy Engelman, Scott Wells, Julie Heim, Dolores Taylor and Dee Buske) deserve a sincere "thank you very much" for operating the office and handling the Annual Meeting registration very efficiently and effectively. They are a truly great team.

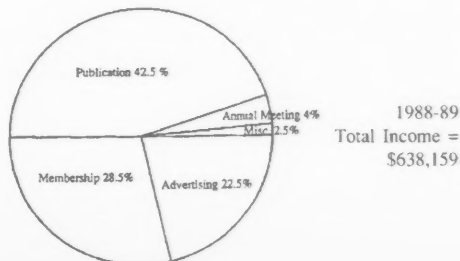
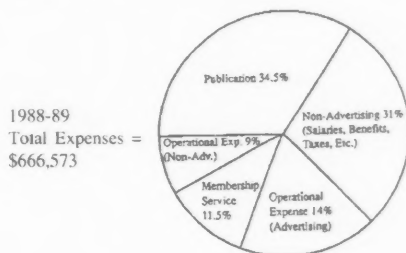
1988-89 Financial Summary — Finances are always an important area of concern. For the 1988-89 fiscal year, the Association had a total income of \$638,159 which came from sources shown below in the Total Income pie chart.

The total expenses for the same time were \$666,573. Monies were spent in the categories shown in the Total Expenses pie chart below.

As you can see, there was a \$28,414 deficit. Our cash flow has been very good, but we have dipped into our reserve to cover expenses. Obviously this practice must be turned around if we are going to accumulate a reserve for office automation and special projects. One area that

is being explored for additional revenue is non-dues income. This category must increase in the future.

Annual Meeting — The 76th Annual Meeting in Kansas City, MO was hosted by the Kansas Affiliate. Local Arrangements Chairman, Don Bechtel and his colleagues planned, organized and coordinated all of the logistics for the meeting and made the 735 attendees feel right at home. Don and all his dedicated staff deserve a special thank you for their hard work and their contributions to a very successful conference. The meeting featured 123 presentations in a variety of food and environmental technical sessions and symposia. President-Elect Ron Case, Dr. Ed Zottola and all the members of the program advisory committee should be congratulated for the fine job they did in arranging the program. There were 15 graduate students representing eight different universities entered in the Developing Scientist Competition. In addition, 66 companies exhibited their materials, equipment or services at our Annual Meeting.



As always, the success of a meeting is measured by the scientific quality of the program, participation by the Membership, the special activities, and the food and accommodations. Judging from these criteria. I think that the 76th Annual Meeting was a huge success!

Association Membership — As of August 4, 1989, Membership in IAMFES is as follows:

• Direct Members	3,118
• Subscriptions	1,387
• Sustaining Members	78
	<hr/>
	4,584

There are scientists, sanitarians, quality assurance professionals, environmental health experts and many other professionals working in food protection and environmental health who should be members of our association. In the year ahead, we need to contact these individuals, make them aware of IAMFES and its objectives and then enlist them as active members. This is one of the most important ways that our organization will grow and prosper. We need your help in identifying people who should be contacted regarding membership in IAMFES.

Member Services — Our most visible member services are our two outstanding journals which are widely circulated and read around the world. Our technical editors, Dr. Lloyd Bullerman of the *Journal of Food Protection* and Dr. Henry Atherton of the *Dairy, Food and Environmental Sanitation* have done a fine job of producing high quality publications. I also want to thank all of our authors for submitting their manuscripts to our journals. Their excellent papers make our publications very highly regarded by food protection professionals. Special thanks are also in order for Dr. Bob Marshall and Harold Bengsch and their Journal Management Committees for their continued interest in and support of our outstanding journals.

Our audiovisual library is another very popular Member service. In the last year there have been 228 requests for the 34 visuals in the library. The Foundation Fund, through the support of our Sustaining Members, commissioned the development of the library several years ago, and it has been a huge success. Dr. David McSwane of Indiana University is the Chairman of the Audiovisual Library Committee. He and his committee have done an excellent job of reviewing and selecting visual training aids. Please don't hesitate to contact Dr. McSwane if you know of any materials that should be reviewed for inclusion in the library.

Steve Halstead will be designing and coordinating a Member needs survey during the next fiscal year. Please take time to complete this survey and let the IAMFES Board know how the organization can serve you better.

Affiliates — There are presently 28 domestic Affiliates, two international Affiliates and one new Affiliate that will receive its charter during this Annual Meeting. The Massachusetts Milk, Food and Environmental Association is the newest Member of the IAMFES family, and we all wish them well as they begin their affiliation with us.

One of the Executive Board goals this past year was to improve communication and services to our Affiliates. This has begun with the restructuring of the election procedures for the IAMFES Council of Affiliates officers. There will also be an affiliate needs survey conducted by the Ames office to further assess what can be done to assist our Affiliates.

Steve Halstead and Executive Board members will be attending several Affiliate Annual Meetings in the year ahead to meet and visit with officers and local Members.

Committee Activities — There are currently 21 IAMFES Committees that are functioning well and addressing key issues in food safety, sanitation and food protection.

I want to personally thank all of the Committee chairs and Committee members for the time and effort that they have contributed during the past year. Our Committees are getting stronger and more active each year. We are slowly moving toward rotating Committee chairs as well as Committee members to assure every Member an opportunity to serve the Association.

Food Safety Activities — IAMFES has been quite active in food safety initiatives in the last year. Your association actively participated in an Institute of Food Technologists (IFT) conference called "Assessing the Optimal System for Ensuring Food Safety: A Scientific Consensus."

Delegates from eighteen scientific societies (IAMFES sent three delegates) whose areas of interest include food safety, gathered in Washington, D.C. to discuss food safety issues. The meeting was organized because of a broad scientific concern that the risks associated with the American food supply are not being accurately communicated to consumers.

Five key interest areas such as:

- Microbiological Hazards
- Environmental Contaminants
- Naturally Occurring Toxicants
- Pesticide Residues
- Food and Feed Additives

were examined and discussed by working groups of delegates. Specific recommendations were given for each area and a report summarizing these findings was generated. This report was then distributed to decision makers in the U.S. Congress, administrators of regulatory agencies responsible for food safety, and the media.

An executive summary as well as a summary of recommendations of the food safety workshop will be reported in a future issue of this journal.

In addition, IAMFES, through the *Journal of Food Protection* is sponsoring a symposium at the Dairy and Food Expo conducted by the Dairy and Food Industry Supply Association. The Expo will take place on November 11-15, 1989 at McCormick Place East in Chicago, IL. Our symposium, entitled "Coping with Food Safety Issues in the '90s" is scheduled for Monday, November 13th from 9:00 a.m. - 10:30 a.m. It will feature distinguished industry speakers including Douglas R. Engebretson, Land-O-Lakes; David R. Henning, Kraft General Foods; and Dennis R. Heldman, National Food Processors Association. These experts will address key safety issues and provide strategies to successfully cope with them.

By participating in these functions, IAMFES gets widespread visibility and attracts the attention of people with interests in food protection. I hope that the Executive Board will continue to seek opportunities to "publicize" IAMFES' role in food protection and to be more proactive and involved in food safety issues programming.

Moving into the '90s — IAMFES has very effectively served the field of food sanitation as well as the dairy industry and parts of the food industry in its 76 years. In the future, the organization needs to continue to attract qualified individuals in other areas of the industry. People from a broad spectrum of disciplines including those with interests in:

- quality assurance and quality control,
- environmental health and safety,
- pesticides and toxicology,
- risk analysis and risk communication,
- food microbiology,
- food science,

and many others need to be actively recruited for Membership. Two categories that need special recruiting efforts are students and local, state and federal regulatory agency officials.

If IAMFES is to continue to grow and prosper, several things need to occur. We need:

- an increase in Membership,
- increased Member services,
- increased educational efforts,
- greater contact with Affiliates,
- increased visibility in the field of food protection,
- a stronger Association.

It has been a privilege to serve as your President during 1988-89. I want to thank my colleagues and friends on the Executive Board for their advice, support and friendship during my term as President. Your Board Members have contributed a great deal of their time and talents in the past year to strengthen the Association. Special thanks to all of the involved and active IAMFES Members who have made my job during the last year a very pleasant and rewarding experience.

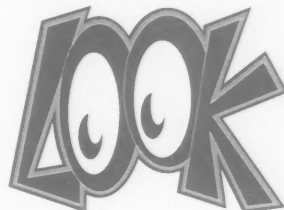
Arthur Koester said, "The principle mark of genius is not perfection but originality, the opening of new frontiers."

I hope that as we approach the '90s, IAMFES opens many new frontiers with all Members contributing to this important goal. If we can accomplish this task, then IAMFES will be the premier food protection association in the United States!

Reprinted from *Dairy, Food and Environmental Sanitation*, Vol. 9, No. 11.



International Association for
Food Protection



ANNOUNCING A NEW

CAREER SERVICES SECTION

FOR

Dairy, Food and Environmental Sanitation

The International Association for Food Protection is pleased to announce a new focus section for *Dairy, Food and Environmental Sanitation (DFES)*. Beginning with the June issue, we will offer a "CAREER SERVICES SECTION." Special rates for this section will provide a cost-effective means for those seeking employment by offering career services and advertising positions available.

To help get this section started we *invite you to advertise in the first two issues at no charge to your organization (up to 1 column by 2" space)*. Larger space sizes are also available to which an appropriate discount would be applied.

Ads appearing in *DFES* will be posted on the Association Web site at www.foodprotection.org at no additional cost.

Call now for your COMPLIMENTARY INSERTIONS.

Contact:

Dave Larson

Phone: 515.987.1359; Fax: 515.987.2003

E-mail: larson6@earthlink.net

Book reviewed by: William LaGrange, Ph.D., Extension Food Scientist, Iowa State University,
Ames, IA 50011

Book Review



Principles of Food Sanitation

Fourth Edition

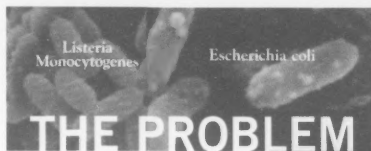
Written by: Norman G. Marriott

P *rinciples of Food Sanitation*, written by Norman Marriott, Professor and Extension Food Scientist at Virginia Polytechnic Institute in Blacksburg is a useful book for student and food processor alike. Sanitation in processing and packaging food obviously is critical to marketing safe, high quality foods. This book presents practical information on how food sanitation should be carried out in the food plant. The material included in this book would make good material for educating employees. At the end of each chapter are study questions useful for an employee training program. Besides references, each chapter has other suggested readings.

Topics in this book include the importance of sanitation during food processing, sanitation regulations pertaining to the food industry, sources of food contaminants including personnel, controlling pests, proper waste disposal, cleaning and sanitizing compounds, methods and equipment, basics of HACCP and quality assurance programs, and basic food microbiology. There are individual chapters on the unique sanitation requirements in processing dairy foods, poultry and meat products, seafood, fruits, vegetable, beverages and low-moisture foods. Also included are practical ideas for designing a food plant that helps in managing effective sanitation programs.

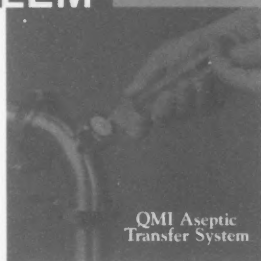
For copies of *Principles of Food Sanitation*, Fourth Edition—

Mail requests to: Aspen Publishers, Inc., 200 Orchard Ridge Drive, Suite 200, Gaithersburg, MD 20878; Phone: 301.417.7500; Price \$59.00 US, Export \$65.00.

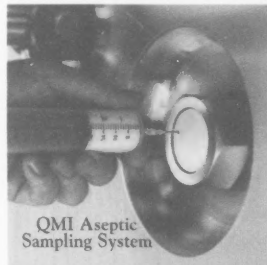


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Reader Service No. 105

NewMembers

AUSTRALIA

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Barbados Dairy Industries Ltd.
St. Michael

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Merv Baker
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Lucy Beck
Crossroads Health Unit
Wetaskwin, Alberta

Gilles R. Turcotte
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Ottawa, Ontario

COSTA RICA

Carmela Velázquez
CITA-UCR, San Jose

NEW ZEALAND

John C. Fam
BioTest Laboratories
Hamilton

PHILIPPINES

Graciano P. Catenza, Jr.
Unicentre Industries Inc.
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SOUTH KOREA

Jeong Gyeongill
SFB Inc., Seoul

UNITED STATES

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Roman I. Chyla
US Army Veterinary Service
Fort Rucker

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Karen M. Birmingham
The National Food Laboratory, Inc.
Dublin

Avalee M. Gehman
Valley Fresh, Inc., Turlock

Paul N. Gerhardt
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Dublin

Edgar S. Gonzalez
Alta-Dena, Industry

Tom P. Vitali
Golden State Vintners
Parlier

Colorado

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Network, Denver

District of Columbia

Thomas Hammack
FDA, Washington

Florida

Douglas L. Archer
University of Florida
Gainesville

Renee L. Kulich
Tropicana N.A., Bradenton

Kristin Phillips
Publix Super Markets, Inc.
Lakeland

Patricia K. Shiver
Publix Super Markets, Inc.
Lakeland

Georgia

Pam Chumley
The Kellen Co., Atlanta

Teresa L. Diekmann
Silliker Laboratories of Georgia
Stone Mountain

William C. Holden
The Facility Group, Smyrna

Christie A. Phillips
University of Georgia
Athens

Doug Smith
University of Georgia
Gainesville

Hawaii

Stacia E. Williams
US Army Veterinary Command
Waipahu

Illinois

Joseph Mitchell
Williams BioEnergy
Lincoln

Iowa

Janet Retz
Townsend Engineering
Des Moines

Michigan

Bradley P. Marks
Michigan State University
East Lansing

Minnesota

Teresa V. Muzzy
Schwan's Sales Enterprises
Marshall

Missouri

Muna N. Naseer
Beatrice Foods, St. Louis

Charles Schasteen
Novus International
St. Charles

Nebraska

Alejandro Amezcua
University of Nebraska-Lincoln
Lincoln

Wade M. Fluckey
University of Nebraska-Lincoln
Lincoln

Kathie Manirath
Cargill-PGLA-1, Blair

New Jersey

Dave Marston
3M, Flemington

Sima Yaron
Rutgers University
New Brunswick

New York

Robert A. Curtis
APV Americas, Tonawanda

North Carolina

Joel D. Laster
Tyson Foods Corporation
Wilkesboro

Roberta A. Morales
Research Triangle Institute
Raleigh

Nancy S. Truluck
Franklin Co. Health Dept.
Spring Hope

Ohio

Christopher Kiefer
Sidney

Roger D. White
Kellogg, Worthington

Pennsylvania

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USDA-ARS-ERRC
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Mechanicsburg

Sam Shannon
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Sunbury

Puerto Rico

Brenda E. Ramos-Torres
San Antonio

South Dakota

Jeff Tostenrud
3M, Brookings

Texas

Victor E. Clark
OBIM Fresh-Cut Fruit Co.
Fort Worth

Michael D. Valenzuela
OBIM Fresh-Cut Fruit Co.
Fort Worth

Virginia

Eric C. Suloff
Virginia Tech
Salem

Washington

Bruce C. Barry
Oberto Sausage Co.
Kent

Jennifer A. Tebaldi
Washington State Dept. of Health
Olympia

Wisconsin

Polly Koepp
Associated Milk Producers, Inc.
Portage

Timothy S. O'Connell
Jones Dairy Farm
Fort Atkinson

New Sustaining Member

Vicky L. Benesch
Celsis Inc.
Evanston, Illinois

UpDates

Silliker Names Hockman Senior V.P. of Operations

Deborah C. Hockman, Ph.D., was named senior vice president of Operations of Silliker Laboratories Group, Inc. in Homewood, IL. In her new role, Dr. Hockman is responsible for leading laboratory services for Silliker's North American network. One of her primary initiatives is to direct the continued expansion of Silliker's chemistry capabilities.

Prior to joining Silliker, Dr. Hockman was vice president of environmental health, safety and technology for Waste Management, Inc. She also served in management roles with pharmaceutical laboratories G. D. Searle and American Cyanamid. Dr. Hockman is a Loyola University (Chicago) graduate with a Ph.D. in analytical chemistry.

"With her experience at these leading Fortune 500 companies, Deborah brings more than 18 years of invaluable technical and chemistry operational expertise to Silliker," said Dr. Russell S. Flowers, Silliker President and CEO.

Parasitologist Joins UGA Food Safety Researchers

Ynes Ortega is a key addition to the University of Georgia research team at the Griffin, GA, Center for Food Safety and Quality Enhancement (CFSQE). Ortega is one of a handful of researchers in the world studying parasites on food.

"We're extremely excited about the new dimension of food safety expertise Dr. Ortega brings to our center," said CFSQE director Michael Doyle. "Her research into this emerging area of food parasitology is certain to have tremendous impact on understanding the behavior, control and elimination of foodborne parasites."

Ortega's research, focuses on parasites in food and water. In 1993, she was part of a team of scientists that first identified *Cyclospora*, a parasite linked to outbreaks in raspberries, basil and lettuce.

By training, Ortega is a medical parasitologist. She is working to adapt detection methods used in the medical field. "We have to find out how to detect them and how to stop them," Ortega said.

LaFave and Grade Join Bell Laboratories, Inc.

Scott LaFave and Kurt Grade recently joined Bell Laboratories as technical sales representatives. As part of Bell's sales and marketing team, LaFave and Grade represent Bell's line of products to distributors and PCOs through individual consultation and trade shows. They also visit sites of rodent infestations with PCOs, providing technical advice on rodent control strategies.

LaFave joins Bell as the new Southwest technical representative. Based in Orange County, CA, he works with distributors and PCOs in Arizona, southern California, and Las Vegas, concentrating heavily on the Los Angeles area.

LaFave holds a bachelor of science degree from Penn State University in health policy and administration. He learned to optimize distribution and sales while working as regional marketing manager for a manufacturer of automobile oils and a line of specialty chemicals.

On the opposite coast, Kurt Grade joins Bell as a technical representative covering the Southeast. Based in Atlanta, GA, Grade travels throughout Tennessee, Mississippi, Alabama, Georgia, South Carolina and North Carolina assisting PCOs and distributors with Bell products.

Grade received a bachelor of arts degree in public relations from Marquette University in Milwaukee, WI. He fine-tuned his sales and distribution experience as field sales manager for a distributor of specialty metal products.

Alfa Laval Flow Inc. Names Inside Sales Manager

David Kirk of Pleasant Prairie, WI has accepted a position with Alfa Laval Flow Inc. as inside sales manager for the sanitary flow division.

Kirk spent three years at Alfa Laval Ltd in Eastbourne, England, as customer support group manager. He brings over 15 years of experience in customer service management to his new role. Kirk will be responsible for managing the activities of the inside sales and pump sales departments.

Very Small Plants Successfully Implement HACCP

The US Department of Agriculture's Food Safety and Inspection Service announced the successful implementation of the new science-based preventive food safety system in all federal and state-inspected very small plants. As of January, all of the nation's meat and poultry supply is produced under the Pathogen Reduction/Hazard Analysis Critical Control Point systems. Plants failing to implement the new system are not eligible for federal or state inspection.

"We've worked diligently with industry groups and universities to ensure very small plants that wanted assistance were given the tools to successfully implement HACCP. I am proud of the plants, industry, universities, and employees of FSIS who made HACCP implementation a success," said Catherine Woteki, under secretary for food safety before the House Appropriations Agriculture Subcommittee.

Of the 3,162 federally inspected very small establishments, only 48 enforcement actions relating to HACCP implementation were necessary. Only 185 plants have voluntarily withdrawn from inspection. The stated reasons include business decisions; HACCP related reasons and conversions to retail exemption status. Retail store operations may be exempt from federal inspection requirements if sales of meat or poultry products made to hotels, restaurants, or similar institutions do not exceed either of two maximum limits in the regulations: 25 percent of the dollar value of total product sales and a total calendar year dollar limitation.



NEWS

Of the 1,995 state-inspected very small establishments, only 65 enforcement actions relating to HACCP implementation were necessary. Only 191 state plants have voluntarily withdrawn from inspection. The stated reasons include business decisions; conversions to retail exemption status, and HACCP reasons. Under HACCP, plants identify hazards, such as microbial contamination that are reasonably likely to occur, develop critical control points in their processes where those hazards can be prevented or controlled, and maintain records documenting that the controls are working as intended.

FSIS helped smooth the way for very small plants after the successful implementation of HACCP in large and small meat and poultry plants. Three hundred large plants came under HACCP in January 1998; 2,300 small plants implemented HACCP in January 1999; and very small plants – those with fewer than 10 employees and less than \$2.5 million in annual sales – implemented HACCP in January 2000. Very small plants were provided self-study guides, which were personally delivered to the plants by FSIS field personnel.

Human Health Risk from Exposure to Natural Dog Treats

In August 1999, the province of Alberta reported an increase in *Salmonella infantis* cases. The initial investigation conducted by the regional public-health authority of Calgary, Alberta, demonstrated that eight of twelve *S. infantis* cases were dog owners, and that nine of twelve had exposure to pig ear dog treats. A pig ear treat taken from the home of one of the cases was also found to be positive for *S. infantis* with the same phage type and pulsed-field gel electrophoresis (PFGE) pattern as found in cases. Subsequent investigation of the implicated processing plant indicated the presence of a variety of *Salmonella* serotypes on finished product including pig ears, as well as other dried pet treats processed in the same manner in the plant.

Both provincial and federal public-health authorities became involved in the investigation with knowledge that the implicated plant distributed product across Canada and to the United States. A national survey of *S. infantis* cases was conducted using a questionnaire requesting information on exposure to dog treats. The survey revealed that cases from other parts of Canada had also been exposed to pig ears. PFGE patterns from the isolates of many of these cases were the same patterns as detected in the Calgary cluster. A matched case-control study involving 21 cases and 40 controls demonstrated a statistically significant increase in the risk of salmonellosis with exposure to pig ear treats.

It is not clear from the investigation whether cases contacted *S. infantis* directly from handling the pig ears, or as a result of the shedding of the organism into their home environments from their asymptomatic pet dogs. One

case did not have contact with a dog, but had handled pig ear treats while in a pet store. Only five of 27 dogs owned by cases exposed to pig ears were reported to be ill; however, *S. infantis* is not normally considered a canine pathogen. The human health risk posed by pets infected with human pathogens is well documented, as is the risk from environmental exposures.

The importance of this health risk to humans is underscored by the fact that, in Canada, the pet treat industry is self-regulated; hence, no government regulatory body is responsible for ensuring the safe practice of this industry. The risk is not restricted to the product of only one manufacturer nor to manufacturers in Canada alone. Pig ear pet treat product from Canadian and American producers have, since this investigation, also tested positive for salmonellae. Among the serotypes isolated from pig ear pet treats was a multiple antibiotic resistant strain of *S. Typhimurium* DT104.

The results of these investigations indicate that pet treats derived from animal parts should be considered a public-health risk if not appropriately processed. In response to the outbreak and because the risk of salmonellosis from exposure to these products was previously unknown, public warnings and health advisories were issued by some provinces and Health Canada. Furthermore, a number of plant investigations have led to as many as 10 voluntary recalls of natural pet products which have been facilitated by the Canadian Food Inspection Agency. Laboratory testing of pet treats is currently being carried out nationwide and similar studies are underway in the United States and Europe as a result of the Canadian investigation and findings.

The pet treat industry has met with federal, provincial, and territorial public-health officials to discuss the problem and is currently in the process of creat-

ing a venue for safe standards development and standards sharing.

Surveillance for Foodborne Disease Outbreaks — United States 1993-1997

Since 1973, CDC has maintained a collaborative surveillance program for collection and periodic reporting of data on the occurrence and causes of foodborne disease outbreaks (FBDOs) in the United States. This summary reviews data from January 1993 through December 1997.

The Foodborne-Disease Outbreak Surveillance System reviews data concerning FBDOs, defined as the occurrence of two or more cases of a similar illness resulting from the ingestion of a common food. State and local public health departments have primary responsibility for identifying and investigating FBDOs. State, local, and territorial health departments use a standard form to report these outbreaks to CDC.

During 1993-1997, a total of 2,751 outbreaks of foodborne disease were reported (489 in 1993, 653 in 1994, 628 in 1995, 477 in 1996, and 504 in 1997). These outbreaks caused a reported 86,058 persons to become ill. Among outbreaks for which the etiology was determined, bacterial pathogens caused the largest percentage of outbreaks (75%) and the largest percentage of cases (86%). *Salmonella* serotype *enteritidis* accounted for the largest number of outbreaks, cases, and deaths; most of these outbreaks were attributed to eating eggs. Chemical agents caused 17% of outbreaks and 1% of cases; viruses, 6% of outbreaks and 8% of cases; and parasites, 2% of outbreaks and 5% of cases.

The annual number of FBDOs reported to CDC did not change

substantially during this period or from previous years. During this reporting period, *S. enteritidis* continued to be a major cause of illness and death. In addition, multistate outbreaks caused by contaminated produce and outbreaks caused by *Escherichia coli* O157:H7 remained prominent. Current methods to detect FBDOs are improving, and several changes to improve the ease and timeliness of reporting FBDO data are occurring (e.g., a revised form to simplify FBDO reporting by state health departments and electronic reporting methods). State and local health departments continue to investigate and report FBDOs as part of efforts to better understand and define the epidemiology of foodborne disease in the United States. At the regional and national levels, surveillance data provide an indication of the etiologic agents, vehicles of transmission, and contributing factors associated with FBDOs and help direct public health actions to reduce illness and death caused by FBDOs.

FSIS Reports Continued Decline of Salmonella

The US Department of Agriculture's Food Safety and Inspection Service reported substantial reductions in the prevalence of *Salmonella* in raw meat and poultry products produced under USDA's new, science-based inspection system at both large and small plants.

"The Hazard Analysis Critical Control Point system (HACCP) has been instrumental in the continuing decline of *Salmonella* prevalence," said Under Secretary for Food Safety Dr. Catherine E. Woteki. "HACCP is one of our best tools for fighting potentially deadly pathogens and ensuring safer meat and poultry for American consumers."

Results of two years of testing in large plants under HACCP

show decreases in *Salmonella* prevalence in all product categories. In pre-HACCP baseline studies, *Salmonella* prevalence in young chicken carcasses was 20 percent and 10.3 percent under HACCP, a difference of nearly 50 percent. Prevalence in swine was 8.7 percent before HACCP and 4.4 percent under HACCP, a difference of nearly 50 percent. In ground beef, prevalence was 7.5 percent prior to HACCP and 5.8 percent under HACCP, a difference of more than 20 percent. Prevalence in ground turkey was 49.9 percent before HACCP and 34.6 percent under HACCP, a difference of more than 30 percent.

Results of one year of testing in small plants under HACCP show a similar trend of decreasing *Salmonella* prevalence in three of the four product categories. In pre-HACCP baseline studies, *Salmonella* prevalence in ground beef was 7.5 percent and 4.3 percent under HACCP, a difference of more than 40 percent. In young chicken carcasses, prevalence was 20 percent before HACCP and 16.3 percent under HACCP, a difference of nearly 20 percent. Prevalence in cow and bull carcasses was 2.7 percent prior to HACCP and 2.3 percent under HACCP, a difference of 15 percent. The only exception to the downward trend was swine carcasses, where 18.2 percent tested positive after HACCP, compared to the performance standard of 8.7 percent. It is expected that small swine plants will evaluate and implement more effective means of reducing *Salmonella*.

Since HACCP implementation, 90 percent of large plants and 84 percent of small plants have met *Salmonella* performance standards. Failure to meet the standards triggers plant actions and can lead to regulatory enforcement action. "The *Salmonella* performance standards are a crucial component of the new science-

based preventive food safety systems," said Woteki. "FSIS selected *Salmonella* because it is a good indicator of sanitary conditions as well as being one of the leading causes of foodborne illness."

NOTE: Baseline surveillance data, upon which *Salmonella* performance standards were calculated, represent a true industry prevalence. Data are production based, were collected over an entire year, and represent 99 percent of production in each species category. The six months of HACCP pre-implementation and compliance phase data do not meet these criteria and were generated using a different sample frame. Large broiler plant representation of production is closer to the baseline 99 percent than would be the case for any type of livestock. A progress report on *Salmonella* prevalence is available at the FSIS Web site at www.fsis.usda.gov.

Eurobarometer 49 — Food Safety

The Commission has received the results of a Eurobarometer survey on the subject of food safety. The survey focuses on six main issues: food safety in general, the factors which determine safety, safety and the retail outlets, sources of information on food safety, labelling and information concerning the products themselves. According to European consumers, bread and other foodstuffs bought in bakeries are the products in which the majority of consumers (86%) have the most confidence, while, on the other hand, confidence in the safety of ready-made meals is very poor (39%). Foodstuffs inspire more confidence in consumers when they have undergone national (66%) or European (43%) controls, as opposed to controls carried out by distributors (29%). Indeed, eight out of ten consumers

call for more and stricter controls, particularly at the production stage. Producers are considered least credible when it comes to telling the truth about food.

Similarly, consumer associations are considered the most trustworthy; one out of two consumers having confidence in them. At any rate, on average, one out of two consumers considers food to be safe when it contains neither pesticides nor hormones and when it is controlled by competent bodies. This analysis shows that consumers want to know as much as possible about foodstuff ingredients. Almost one out of two consumers believe that the safest food products are to be obtained in the supermarkets and from farmers and small producers, while one out of five consider small grocery shops to be less dependable. In general, there is a relatively low level of confidence in producers, whether because of the information they provide about the product or, more importantly, because of the fact that they sell products that are profitable, but not safe. Consumer associations are considered to be by far the most reliable source of information with regard to foodstuffs, one out of two consumers having confidence in them, followed by the national authorities (one out of four) and the European Institutions (one out of five). As regards confidence, the Dutch clearly stand out from the other Europeans. The results show that they have a very high level of confidence, exceeding the averages recorded in the other Member States — whether it comes to their being told the truth about foodstuffs or where labelling information is concerned. Nor do they insist that more controls are needed. They are less fearful of possible additives and preservative agents in foodstuffs. On the other hand, the Greeks tend to be more wary and often have very determined views on foodstuffs. For

their part, the Irish are the most hesitant and seem to be the least interested in food safety. Most of them tend to answer "Don't know" rather than express an opinion on the subject. In general, supervisory staff, the self-employed and white-collar workers are more distrustful than the other categories where food safety is concerned. They consider that controls are essential for food safety. In addition, they would like clear labelling information in the form of letters or a combination of letters and symbols. As regards to labels, younger people are less likely to read them than their elders, mainly due to lack of interest. Despite this, the analysis shows that they are highly confident in foodstuffs – but on what grounds? Labels remain a good source of information, six out of ten consumers claiming to regularly read them.

The most valued part of labelling seems to be the sell-by date, the less interesting part being the clear indication of a product's place of origin (nearly nine out of ten consumers were in agreement about this), as well as the likely presence of GMOs.

Outbreak of Listeriosis Linked to the Consumption of Pork Tongue in Jelly in France

Twenty-six cases of listeriosis, all with *Listeria monocytogenes* serotype 4b infection with the same DNA macrorestriction pattern, were identified in France between mid November 1999 and 29 February 2000 by the National Reference Centre for Listeria (Pasteur Institute, Paris). Five adults and two

newborn babies have died and one pregnant woman had a spontaneous abortion.

The cases arose in 21 different departments throughout France, suggesting that the vehicle might be a nationally distributed food. Results of a case control study carried out by the Institut de Veille Sanitaire and district health departments showed that the consumption of pork tongue in jelly was associated with infection with the outbreak strain. Thirteen out of 23 cases interviewed reported having eaten this product and the others had all eaten pâté and other meat products from delicatessens.

At present, it is impossible to implicate with certainty a manufacturer as the source of the outbreak. Investigations are in progress and include continuous case-surveillance, sampling of meat products on sale in shops used by cases and investigation of their supply channels in order to identify a common processing plant, investigations of major plants that produce pork tongue in jelly and of plants that supply the shops used by cases, and screening for the epidemic clone among strains isolated from meat products in France in recent months.

Reported by Henriette de Valk (h.devalk@invs.sante.fr) for the Listeriosis Investigation Team, Institut de Veille Sanitaire, France.

FSIS Approves Minnesota State Poultry Inspection Program

The US Department of Agriculture's Food Safety and Inspection Service announced that Minnesota has implemented a state poultry inspection program. In December 1998, Minnesota began administering a state meat inspection pro-

gram that included requirements at least equal to those of the federal meat inspection program. FSIS amended regulations to allow Minnesota to implement a similar state inspection program for poultry products on February 11th.

FSIS carries out the federal inspection program and has oversight of state programs. Federal laws require USDA inspection of meat and poultry products before they can be sold and transported interstate or to foreign countries. State inspected meat and poultry can only be sold within the state. Last fall, USDA forwarded a bill to Congress that would provide for interstate shipment of state inspected meat and poultry. In November, Senators Thomas Daschle (D-SD) and Orrin Hatch (R-UT) introduced the legislation, the "New Markets for State-Inspected Meat Act of 1999." "We are pleased to announce that Minnesota has developed and implemented poultry products inspection requirements that are equivalent to those of USDA and will now be responsible for administering its own poultry products inspection program," said FSIS administrator Thomas J. Billy. The Poultry Products Inspection Act provides that whenever the secretary of agriculture determines that any state has developed and will enforce state inspection requirements at least equal to those imposed by the federal government, the secretary will permit the state to operate its own inspection program. The secretary has determined that the state of Minnesota has developed and is in a position to enforce effectively such a state poultry products inspection program in accordance with applicable provisions of the PPIA.



Ramsey - A Thermo Sentron Company

Ramsey Introduces Its New Icore ACCUSTAR™ Weighframe

Ramsey has introduced a new weighframe in its fine line of checkweighing equipment. The ACCUSTAR™ Global Check-weigher uses the latest, state-of-the-art technology, truly making it a star performer.

Rigidly constructed with a finite analysis, open and modular design, the ACCUSTAR offers superior weighing properties. Its unique dual load cell weightable mount reduces vibration, increases accuracy and side loading protection, improves temperature compensation and offers greater stability. Load cell error is also effectively cut in half. The ACCUSTAR has individual motors that allow for independent speed

adjustment of each conveyor, requiring fewer spare parts and no cumbersome drive arrangement. Its quick-change connectors minimize change time and allow for tool-free removal of conveyors.

The ACCUSTAR's flip-up tail pulley makes cleaning and maintenance easy while its fiber optic photo eye permits simple installation and replacement. The frame has fully crowned rollers for better tracking and a solid side frame for a more pleasing, cleaner look. What's more, the ACCUSTAR can be paired with any of Ramsey's precise, time-proven check-weighing electronics.

Ramsey - A Thermo Sentron Company, Minneapolis, MN

Reader Service No. 262

Ryan Introduces Economical Strip Chart Recorder

The EZT from Ryan Instruments is a portable strip-chart recorder designed specifically for in-transit monitoring of perishable products. It was introduced at the 2000 exposition of the United Fresh Fruit and Vegetable Association in Phoenix, AZ, on February 26, 2000.

An indispensable tool for the produce, perishable food and horticultural industries, the EZT offers the security of a third-party monitoring system at an economical price.

Completely self-contained and delivered ready for customer use,

the EZT is available in day spans of 5, 10, 20 and 40 days. Powered by a single 1.5V AA battery, it measures temperatures in a range of -20°F to +100°F with operating accuracy of $\pm 2^\circ\text{F}$ across the full range. Large enough to be seen on loads, yet small enough to be convenient to use, the EZT has features to protect the chart and indicate tampering. Bilingual instructions in Spanish and English are on the instrument.

Ryan Instruments, Redmond, WA

Reader Service No. 263

The New LSM 510 NLO Confocal Laser Scanning Microscope with Multi-photon Excitation

Carl Zeiss introduces an enhanced model of the well-established LSM 510 confocal laser scanning microscope, LSM 510 NLO, expanding application possibilities in biology and medicine.

The innovative and flexible scanning strategies of the LSM 510 have been supplemented by additional new functions. The combination of the LSM 510 with the Axioskop 2 FS motorized fixed-stage microscope stand permits simultaneous confocal imaging and electrophysiological measurements. Integrated short-pulse lasers allow multi-photon excitation, protecting living specimens and implementing optimum 3D selectivity and resolution.

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The new 4D-Scan permits image stacks to be recorded over time (xyz-t). Functions for the display, analysis, 3D reconstruction and archiving of image stacks over time are available as well. The Spline Scan mode allows scanning along any curved or freehand line. This enables biological structures, e.g. neuronal and cellular processes, to be optimally examined.

The optimum synthesis of confocal imaging and electrophysiological measurements is made possible by the new combination of the LSM 510 with the Axioskop 2 FS motorized microscope stand. This upright fixed-stage stand provides objective focusing and a new lifting and pushing mechanism for application-oriented objective change. A new line of state-of-the-art immersion objectives for electrophysiology applications completes the configuration.

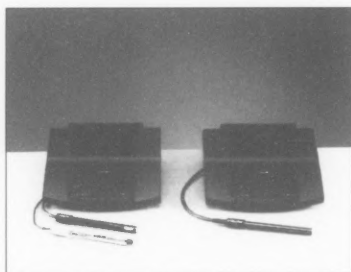
The LSM 510 NLO features fiber-coupled, short-pulse lasers in the IR range for multi-photon excitation. Buddy Bossmann, Product Manager for Carl Zeiss, comments, "Control of the laser intensity via an acousto-optical element provides fast (pixel to pixel) beam blanking to protect living specimens during flyback and true region of interest scanning or bleaching. In addition to the time-tested possibilities of the LSM 510, simultaneous confocal and multi-photon operation is possible without restriction for various fluorescence markers. Therefore, conventional counterstains can still be used, and UV dyes are now simply excited via multi-photon absorption."

The new filter combinations in the detection module make LSM 510 NLO even more suitable for the increasing use of all types of GFP (Green Fluorescent Protein). New fiber decoupling of a confocal detection channel permits connection of any required detect-

or. Thus a spectrometer makes it possible to determine the spectral properties of dyes in the cellular surrounding or in cell compartments in any region of interest, and thus to select the suitable filter combination for optimum detection.

Carl Zeiss, Inc., Thornwood, NY

Reader Service No. 264



Orion Research, Inc.

Models 555A and 535A pHuture M.M.S.™ Multi-Measurement Systems

Orion is pleased to introduce the latest achievement in electrochemistry. These advanced benchtop Multi-Measurement Systems allow the user to utilize Orion pHuture™ technology to simultaneously gather many different measurements from a single sample using one 12 millimeter electrode! The Model 555A measures pH, mV, conductivity, TDS, salinity, resistivity, and ORP as relative mV or E_H , and temperature. Meter input include standard BNC for traditional pH measurement, traditional conductivity input for 2 or 4-electrode cells, plus an input for the world's first "five-in-one" pHuture Pentrode™ probe. The Orion Model 535 advanced benchtop meter measures pH, mV, ORP, and temperature with the same versatile probe technology, but is designed for those users requiring only pH and ORP measurements.

An entire new line of Orion pHuture probes is available with different measurement combinations in submersible Low Maintenance™ and easy cleaning Sure-Flow® styles.

Both Advanced meters offer enhanced calibration options including pH auto-buffer recognition of up to five points, and the 555A offers conductivity calibrations including Auto-Cal™, DirectCal™, cell constant adjustment, or multi-point calibration of up to five points. Powerful data-logging and printing options allow for unattended analysis and data collection that meets stringent GLP requirements. Both meters carry a three-year warranty.

Orion Research, Inc., Beverly, MA

Reader Service No. 265

Syncro Vac Receives 3-A Sanitary Standards Symbol Certification for Dairy Industry

Syncro Vac, announced that they received a Certificate of Authorization to apply the 3-A symbol to their polished metal tubing for milk and milk products from the 3-A Sanitary Standards Symbol Administrative Council.

The 3-A symbol designates that Syncro Vac's products consisting of all types of bent and pulled stainless steel components fully comply with the 3-A Sanitary Standards designated.

"We feel it is important to comply to all standards that are recognized by the USDA," said Howland Foster, vice president of sales and marketing at Syncro Vac. "Our products not only enable dairies to run cost-effectively, but they also promote sanitary environments."

Syncro Vac, Milpitas, CA

Reader Service No. 266

Dickson's New KT655 – Microprocessor-based Temperature Recorder

Dickson announces that they are offering a NEW model to their KT6 microprocessor-based series of recorders, the KT655.

Dickson's KT655 is a 6" microprocessor-based, two-channel temperature chart recorder with data logging capability. The KT655's two k-thermocouple probes ensure fast and accurate temperature measurements. Whether you need to record in a high temperature oven or a low temperature freezer, the KT6 series offers complete flexibility and valuable features.

In addition to the paper chart record, all data can easily be downloaded to your PC for viewing, graphing, or printing with DicksonWare™ software. The KT655 is also capable of real time monitoring from your PC.

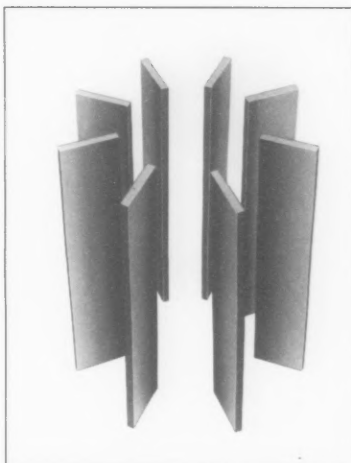
All KT6 series recorders feature panel and wall mount capability, a DIN compatible enclosure, AC power with battery back-up, programmable recording times, and 15 user selectable temperature ranges. Additional features include digital display, audible alarm, and a SPST alarm/relay contact.

Dickson Company, Addison, IL

Reader Service No. 267

General Magnaplate Provides Abrasion and Corrosion-Resistant Synergistic Coatings

General Magnaplate Corporation's MAGNADIZE® Synergistic Coatings improve corrosion resistance, hardness



General Magnaplate Corporation

and lubricity of magnesium and magnesium alloys. MAGNADIZE® coatings are used in a wide variety of commercial applications, including sliding vanes in rotary compressors, air operated tools, and turboprop gear splines and housings.

The product line offers coating thickness from 0.0003-0.0020", and provides varying degrees of wear and corrosion resistance; lubricity and friction requirements for specific applications and alloys. The coatings meet MIL-M-45202, and AMS-2476B, CPW 331-21 through 25 as well as over 1,000 hours salt spray per ASTM B-117.

Several coatings provide hard wear resistance from Rc 35-60, depending on thickness; exceptional resistance to water, steam, oils, acids and alcohols; and low friction from 0.04 to 0.15. The temperature range is from -100° to +550°F. Several classes of the product line offer custom infusion with suitable polymers and sealers for special finishes, while others allow metal-to-metal bonding.

Once MAGNADIZE coatings become part of the metal surface,

it becomes impossible to peel, flake or strip. Additionally, because of its superior hardness, it resists nicks and scratches.

General Magnaplate Corporation, Linden, NJ

Reader Service No. 268

New Kits from Pall Gelman Laboratory Provide Membrane and Reagents Optimized for the Chemiluminescent Detection of Proteins

Pall Gelman Laboratory's new Protein Detection Kits with BioTrace™ PVDF Membrane provide sensitive detection of proteins using horseradish peroxidase labeled secondary antibodies and LumiGLO® Chemiluminescent Substrate. The kit includes membrane and reagents developed to perform optimally together and provide sensitivity equaling radioactive detection without the associated hazards or disposal concerns. Proteins can be detected after electrophoresis and transfer (Western blotting) or quantitated by dot blotting directly on the membrane.

The new kits use an enzyme-linked affinity purified secondary antibody coupled to horseradish peroxidase (HRP) and a highly sensitive chemiluminescent substrate. Signal can be measured using a camera luminometer or by exposing X-ray film to the membrane. If necessary, blots can be stripped and reprobed after detection.

Pall Corporation, Ann Arbor, MI

Reader Service No. 269

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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International Association for
Food Protection

Paul A. Hall *Elected IAFP Secretary*



The International Association for Food Protection welcomes Paul A. Hall to the Executive Board as Secretary. Mr. Hall will take office at the conclusion of the Awards Banquet at the 87th Annual Meeting in Atlanta, Georgia.

By accepting this position, Mr. Hall has made a five-year commitment to the Association and will serve as President in 2004.

Mr. Hall is Director of Microbiology and Food Safety for Kraft Foods where he is responsible for developing and directing strategic microbiological safety and research programs including microbiological risk management, control of pathogens and spoilage organisms, HACCP implementation and regulatory compliance. Prior to joining Kraft in 1989, he held corporate microbiology positions for Anheuser Busch Companies and Ralston Purina Company.

During his 25-year career, Mr. Hall has published and lectured extensively in the area of microbiological food safety and has served on a number of microbiological trade and professional association technical committees. He is an active member and past-chair of the International Life Sciences Institute's (ILSI) Technical Committee on Food Microbiology and was instrumental in forging the highly successful Annual Meeting collaboration between IAFP and ILSI. Mr. Hall has been an active Member of IAFP since 1987. He is currently vice-chair of the Annual Meeting Program Committee and is also a member of the *Journal of Food Protection* Management Committee, past editorial board member of the *Journal of Food Protection* and past Black Pearl Award Jury Committee member. Mr. Hall has organized and chaired numerous Annual Meeting symposia and programs over the past twelve years.

Congratulations

CALL FOR SYMPOSIA

2001 Annual Meeting

August 5-8, 2001

Minneapolis, Minnesota

The Program Committee invites International Association for Food Protection Members and other interested individuals to submit a symposium proposal for presentation during the 2001 Annual Meeting, August 5-8, 2001 in Minneapolis, Minnesota.

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 17, 2000 or by presenting the proposal to the Program Committee at its meeting on Sunday, August 6, 2000 in Atlanta, Georgia. 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 2000 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. 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

**2001 Annual Meeting
August 5–8, 2001
Minneapolis, Minnesota**

Title: _____

Organizer's Name: _____

Address: _____

Phone: _____ Fax: _____ E-mail: _____

Topic – Suggested Presenter, Affiliation

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

1. _____

2. _____

3. _____

4. _____

5. _____

6. _____

Suggested Convenors:

Description of Audience: _____

Signature of Organizer: _____

Receipt by mail
by July 17, 2000 to:

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

Submit in person
on August 6, 2000 to:

Program Committee
International Association for Food Protection 87th Annual Meeting
Atlanta, GA

or 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



GOLF TOURNAMENT

The Golf Club
at Bradshaw Farm

Sunday, August 6, 2000
(6:00 a.m. – 2:00 p.m.)

Cost: \$90.00 (\$105.00 after June 30, 2000)



Enjoy spectacular views of the northern Georgia mountains as you join your friends and colleagues in a round of golf at The Golf Club at Bradshaw Farm. Everyone is invited to participate in this best-ball tournament. Built on historic farm property, the

unique barn-style club house is reminiscent of the great history attached to the course. With elevated tees, tree-lined bermuda fairways and meticulously groomed bentgrass greens, Bradshaw Farm remains one of the most highly regarded layouts in the Atlanta metro area and is perfect for golfers of all skill levels. What an ideal way to kick off the 87th Annual Meeting!

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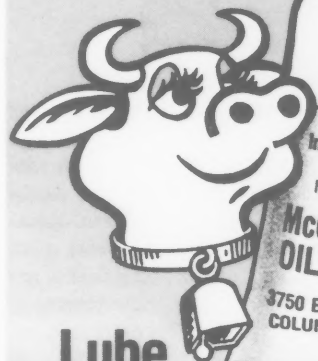
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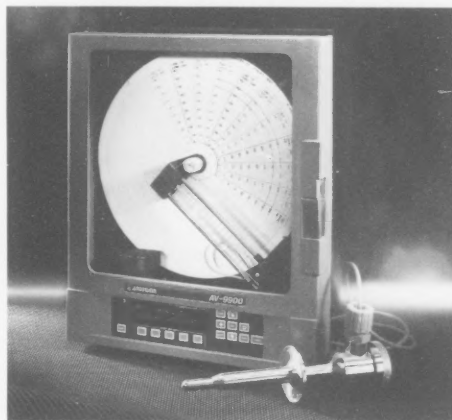
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Reader Service No. 161

A N D E R S O N

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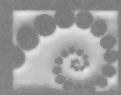
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Reader Service No. 141



FERNBANK
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Fernbank Museum of Natural History

Cost: Adults – \$39.00 (\$44.00 after June 30, 2000)

Children – 14 and under \$34.00 (\$39.00 after June 30, 2000)

(Buffet included)

A world of exciting adventure awaits you. At your leisure, dine with colleagues and explore the unique state-of-the-art galleries and exhibitions.

For a limited time only, Life & Death Under the Pharaohs is being featured. This is one of the largest traveling exhibitions of Egyptian art, featuring 300 antiquities and scale models. Don't miss out on this once in a lifetime opportunity!

Other exhibits open for your enjoyment will be:

- A Walk Through Time in Georgia
- Cultures of the World
- First Georgians



LIFE & DEATH
UNDER THE
PHARAOHS



Donate an Item Today for the 3rd Annual Foundation Fund Silent Auction!

The Third Annual Foundation Fund Silent Auction will be held at the 87th Annual Meeting in Atlanta, Georgia, August 6-9, 2000.

Why donate an item to the auction?

Last year's auction raised over \$2,000 for the Foundation Fund. Promote your state or organization by donating items now to help the Foundation exceed its goal of \$100,000 in 2000. The Foundation benefits the Ivan Parkin Lecture, the Developing

Scientist Competition, the Audiovisual Library, and co-sponsorship of the Crumline Award. It also provides surplus *JFP* and *DFES* journals to developing countries.

If you would like to donate an item, contact Frank Zuehlke at the Association office, Phone: 800.369.6337; 515.276.3344; or E-mail: fzuehlke@foodprotection.org A listing of auction items and donors will be included in the Annual Meeting Program and Abstract Book. Notification of donated items must be received by June 15, 2000 to be listed in the Program and Abstract Book.



International Association for
Food Protection

Visit our Web site at www.foodprotection.org
for the most current Annual Meeting information.



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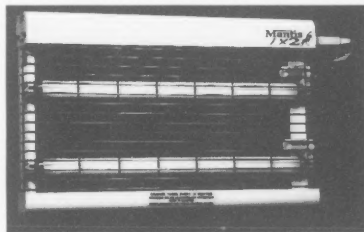
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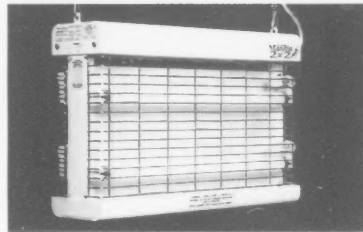
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GARDEX

Reader Service No. 139

Award Winners



for the
International Association
for Food Protection
87th Annual Meeting

Black Pearl

Zep Manufacturing Company

Honorary Life Membership

William Arledge
Robert L. Sanders

Fellows

John C. Bruhn, Cameron R. Hackney,
Bruce E. Langlois, and Lloyd O. Luedecke

Harry Haverland Citation

F. Ann Draughon

Educator

Susan Sumner

Sanitarian

Norris A. Robertson, Jr.

Harold Barnum Industry

Kenneth Anderson

NFPA Food Safety

Elmer H. Marth

2000 Affiliate Awards

C.B. Shogren Memorial

Michigan Environmental Health Association

Best Affiliate Communication Materials

New York State Association
of Milk and Food Sanitarians

Best Affiliate Annual Meeting

Florida Association of Milk, Food
and Environmental Sanitarians, Inc.

Best Affiliate Educational Conference

Associated Illinois Milk, Food
and Environmental Sanitarians



International Association for Food Protection

Formerly IAMFES

6200 Aurora Avenue, Suite 200W
Des Moines, Iowa 50322-2863, USA

To All Association Members:

Today I'm writing to encourage your involvement in the International Association for Food Protection, specifically in our Committees and Professional Development Groups (PDGs). You may volunteer to serve on any number of Committees or PDGs. Each of these groups serves a vital function in the Association and your expertise is welcome and needed! If you have participated with our Committees or PDGs in the past, I commend you for your service and challenge you to continue.

Committees and PDGs meet during the Annual Meeting and may meet throughout the year via conference call or E-mail. Even if you are not able to attend the Annual Meeting, your involvement is still possible. Please review the Committees and PDGs on the following pages to find a group that is of special interest to you. Call the Chairperson listed to learn more about the function of the group. Then, if it sounds inviting, volunteer your time. Through active participation, you can establish a network of contacts, help better the profession, and strengthen your leadership skills.

Your input and ideas are welcome at all times. So accept the challenge today; call one of the Chairpersons to let him or her know of your interest in sharing your knowledge and expertise with other IAFP Members.

I'm looking forward to seeing your name on our next Committee listing!

Sincerely,

James S. Dickson
Vice President, IAFP

"Our mission is to provide food safety professionals worldwide with a forum to exchange information on protecting the food supply."
Publisher of the *Journal of Food Protection and Dairy, Food and Environmental Sanitation*

Committee Chairpersons

Professional Development Groups, Task Forces, and Support Groups



STANDING COMMITTEES

Dairy, Food and Environmental Sanitation Management Committee

Linda J. Harris

Phone: 530.754.9485

Fax: 530.752.4759

E-mail: ljharris@ucdavis.edu

Journal of Food Protection Management Committee

Donald E. Conner

Phone: 334.844.2639

Fax: 334.844.2641

E-mail: dconner@acesag.auburn.edu

Program Committee

David A. Golden

Phone: 865.974.7247

Fax: 865.974.2750

E-mail: dgolden@utk.edu



SPECIAL COMMITTEES

Audiovisual Library Committee

John H. Christy

Phone: 608.388.3524

Fax: 608.388.2542

Awards Committee

Elizabeth M. Johnson

Phone: 803.896.0872

Fax: 803.896.0983

E-mail: johnsoem@columb68.dhec.state.sc.us

Black Pearl Selection Committee

Robert Brackett

Phone: 202.205.8139

Fax: 202.205.4422

E-mail: Robert.Brackett@cfstan.fda.gov

Committee on Communicable Diseases Affecting Man

Frank L. Bryan

Phone: 770.760.1569

Constitution and Bylaws Committee

Michael H. Brodsky

Phone: 905.889.8092

Fax: 905.889.2276

E-mail: mhbrodsky@home.com

Developing Scientist Awards Committee

Donna M. Garren

Phone: 703.836.3410 ext. 103

Fax: 703.836.2049

E-mail: donna@uffva.org

Fellows Selection Committee

Robert Brackett

Phone: 202.205.8139

Fax: 202.205.4422

E-mail: Robert.Brackett@cfstan.fda.gov

Foundation Fund Committee

Harry Haverland

Phone: 513.851.1810

Nominating Committee

C. Dee Clingman

Phone: 407.245.5330

Fax: 407.245.5173

E-mail: dclingman@darden.com

Past Presidents' Committee

Gale Prince

Phone: 513.762.4209

Fax: 513.762.4372

E-mail: gprince@kroger.com

Committee on Sanitary Procedures

Dan Erickson

Phone: 612.297.2134

Fax: 612.297.5176

E-mail: daniel.erickson@state.mn.us

Tellers Committee

C. Dee Clingman

Phone: 407.245.5330

Fax: 407.245.5173

E-mail: dclingman@darden.com



**PROFESSIONAL DEVELOPMENT
GROUPS**

**Applied Laboratory Methods
Professional Development Group**

Shelagh McDonagh

Phone: 403.299.7611 Fax: 403.221.3293
E-mail: mcdonaghs@em.agr.ca

**Dairy Quality and Safety
Professional Development Group**

Wallace C. Jackson

Phone: 724.946.8729 ext. 400 Fax: 724.946.2261

**Food Safety Network
Professional Development Group**

Doug Powell

Phone: 519.821.1799 Fax: 519.763.8933
E-mail: dpowell@uoguelph.ca

**Food Sanitation
Professional Development Group**

Frank Yiannas

Phone: 407.828.5848 Fax: 407.934.6466
E-mail: frank_yiannas@wda.disney.com

**Fruit and Vegetable Safety and Quality
Professional Development Group**

Jeffrey M. Farber

Phone: 613.957.0895 Fax: 613.941.0280
E-mail: jeff_farber@hc-sc.gc.ca

**Meat and Poultry Safety and Quality
Professional Development Group**

Norman Stern

Phone: 706.546.3516 Fax: 706.546.3771
E-mail: nstern@ars.usda.gov

**Microbial Food Safety Risk Assessment
Professional Development Group**

Donald W. Schaffner

Phone: 732.932.9661 ext. 214 Fax: 732.932.6776
E-mail: schaffner@aesop.rutgers.edu

**Retail Food Safety and Quality
Professional Development Group**

O. Peter Snyder

Phone: 651.646.7077 Fax: 651.646.5984
E-mail: osnyder@hi-tm.com

**Seafood Safety and Quality
Professional Development Group**

Carlos Abeyta

Phone: 425.483.4870 Fax: 425.483.4996

**Student
Professional Development Group**

Scott L. Burnett

Phone: 770.228.7283 ext. 115 Fax: 770.229.3216
E-mail: sburnett@cfsqe.griffin.peachnet.edu

**Viral and Parasitic Foodborne Disease
Professional Development Group**

Daniel J. Maxson

Phone: 702.437.4376 Fax: 702.437.5941



**TASK FORCES
HACCP Task Force**

Peter J. Slade

Phone: 708.563.8172 Fax: 708.563.1873
E-mail: pslade@iit.edu



**SUPPORT GROUPS
Affiliate Council**

Randall Daggs

Phone: 608.266.9376 Fax: 608.267.3241
E-mail: daggsra@dhfs.state.wi.us

ATTENTION STUDENTS!

Attend the Student PDG Luncheon

Sunday, August 6, 2000 • (12:00 p.m. - 1:30 p.m.)

Sign up with your Annual Meeting Registration Form at www.foodprotection.org

Ivan Parkin Lecture

Presented by: Douglas Powell, Ph.D.

Reclaiming Dinner: Enhancing Food Safety and Consumer Confidence

Sunday, August 6, 2000

Opening Session — 7:00 p.m.



Lecturer:

Douglas Powell, Ph.D.
University of Guelph
Guelph, Ontario, Canada

Dr. Douglas Powell is an Assistant Professor in the department of plant agriculture at the University of Guelph. As Director of the five-year Agri-Food Risk Management and Communication project at Guelph, he leads a diverse research team that integrates scientific knowledge with public perceptions to garner the benefits of a particular agricultural technology or product while managing and mitigating identified risks.

Dr. Powell led the development and implementation of an on-farm food safety program for the Ontario Greenhouse Vegetables Growers Association, a producer-led program to minimize microbial risks in fresh produce. He also led research to better understand producer perceptions that

could impede adoption of refugia guidelines to mitigate the development of resistance when growing genetically engineered Bt-corn. Dr. Powell is now helping the Ontario Cattlemen's Association implement good production practices for the use of antimicrobials in cattle. He also teaches and conducts research into the broader public discussions involving technology and society, which shape public attitudes and policy decisions. Such work included the creation and daily editing of the listserv, the Food Safety Network (FSnet).

Dr. Powell completed a BSc (honors) in molecular biology and genetics at the University of Guelph in 1985. After two years of graduate work he entered journalism through the student press. He has served as editor of several community newspapers, has written for a diverse range of magazines, and continues as a freelance journalist. His book, *Mad Cows and Mother's Milk*, co-authored with Bill Leiss of Queen's University, was published by McGill-Queen's University Press in 1997.

Dr. Powell completed a doctoral degree in the department of food science at the University of Guelph in 1996. His thesis concerned applying risk communication theory to issues of food safety and agricultural biotechnology.



International Association for Food Protection

87th Annual Meeting

Preliminary Program



SUNDAY EVENING – AUGUST 6, 2000

7:00 p.m. – 8:00 p.m.

Opening Session

- Presentation of the International Association for Food Protection Fellows Awards
- Ivan Parkin Lecture – **Reclaiming Dinner: Enhancing Food Safety and Consumer Confidence**, Douglas Powell, Ph.D., University of Guelph, Guelph, Ontario, Canada
Cheese and Wine Reception will follow in the Exhibit Hall

MONDAY MORNING – AUGUST 7, 2000

(8:30 a.m. – 12:00 p.m.)

S1 *Listeria monocytogenes*: Current Issues and Concerns – Session I: Pathology, Virulence, and Risk Assessment of *L. monocytogenes* *(Sponsored by ILSI-NA)*

- Relevance of Animal Models to Study Virulence of *L. monocytogenes* – JEFFREY M. FARBER, Health Canada, Microbiology Research Division, Ottawa, Ontario, Canada
- Primates as a Model for *L. monocytogenes* Infective Dose: A Progress Report – MARY ALICE SMITH, University of Georgia, Athens, GA, USA
- Relationship between Virulence in *L. monocytogenes* Genotypes – MARTIN WIEDMANN, Cornell University, Ithaca, NY, USA
- Risk Assessment of *L. monocytogenes*: Prevalence in the Food Supply – BENITE OJENIYI, The Royal Veterinary and Agricultural University, Stigbojlen, Frederiksberg C, Denmark
- Risk Assessment of *L. monocytogenes*: Impact of Cooking and Food Handling Procedures in the Home – CHRISTINE M. BRUHN, University of California Davis, Davis, CA, USA

- Update on FDA's Risk Assessment of *L. monocytogenes* – RICHARD C. WHITING, FDA, Washington, D.C., USA

S2 Safer Production of Sprouts from Seeds

- Overview: Outbreaks Associated with Consumption of Sprouts and the Response from Government, Industry and Academia – MICHELLE SMITH, FDA-CFSAN, Washington, D.C., USA
- Pathogen Monitoring during Sprouting of Alfalfa Seeds – T. J. FU, NCFST/FDA, Summit-Argo, IL, USA
- Effectiveness of Chemical Sanitizers Applied to Seeds and Sprouts – LARRY BEUCHAT, University of Georgia, Griffin, GA, USA
- Sanitizing Laboratory Inoculated and Naturally Contaminated Alfalfa Seed with Chemicals – BILL FETT, USDA-ARS, Wyndmoor, PA, USA
- Elimination of *E. coli* O157:H7 and Control of *Salmonella* on Alfalfa Seed by Gamma Irradiation – DON THAYER, USDA-ARS, Wyndmoor, PA, USA
- What Have We Learned, and Where Do We Go from Here? Implications for the Sprout Industry and Others – PETER J. SLADE, NCFST/IIT, Summit-Argo, IL, USA

S3 Cook-chill/Sous Vide Technology

- European Cook-chill Technology – KRISTEL HAUBEN, Alma University Restaurants, Leuven, Belgium
- US Processor Cook-chill Technology – ERIC CARRE, Erdatek, Inc., Chicago, IL, USA
- Commercial Cook-chill in Europe – LUC PAEPE, Hot Cuisine, Gent, Belgium
- US Institutional Cook-chill – MARY COTTER, OHM, Cook Chill Production Center, Orangeburg, NY, USA

(Monday morning, *continued*)

- Cook-chill Equipment Technology – LEN BUNDY, George E. Bundy and Associates, Seattle, WA, USA
 - The Microbiological Safety of Cook-chill Foods – JOHN AUSTIN, Banting Research Center, Microbiology Research Division, Ottawa, Ontario, Canada
- S4 The Role of Molecular Techniques for *Vibrios* and Viruses in Making Risk Management Decisions**
- Infective Dose for *Vibrio parahaemolyticus*, *V. vulnificus* and Viruses, in Raw Oysters and Its Correlation to counts with Oysters during Harvesting – KEN MOORE, Interstate Shellfish Sanitation Conference, Columbia, SC, USA
 - Molecular Approaches for the Detection of Bacteria with Special Reference to *Vibrios* in Seafood – ASIM K. BEJ, University of Alabama-Birmingham, Birmingham, AL, USA
 - Molecular Techniques for Viruses and Their Limitations: New Frontiers in Non-molecular Methods – GARY P. RICHARDS, USDA, Dover, DE, USA
 - Risk Assessment on the Public Health Impact of *Vibrio parahaemolyticus* in Oysters – MARIANNE MILIOTIS, FDA, Office of Seafood, Washington, D.C., USA
 - Industries Perspective on Use of Molecular Biological Techniques as a Preventive Tool – CHRIS NELSON, Bon Secour Fisheries Inc., Bon Secour, AL, USA
- T1 Foodborne Pathogens**
- T1 Heat Resistance and Survival of Alkali-stressed *Listeria monocytogenes* – PETER J. TAORMINA, and Larry R. Beuchat, University of Georgia, Griffin, GA, USA
- T2 *Listeria monocytogenes* in UHT Milk: A Case Study – CHARLES N. CARVER, Karen Kinnberg, and Ronald Johnson, Land O Lakes/R-Tech Laboratories, Arden Hills, MN, USA
- T3 The Ability of Sublethally Heat-injured *L. monocytogenes* Cells to Compete with a Commercial Mesophilic Lactic Acid Starter Culture during Milk Fermentation – FINNY P. MATHEW, and Elliot T. Ryser, Michigan State University, East Lansing, MI, USA
- T4 Growth of *Listeria monocytogenes* and *Escherichia coli* O157:H7 is Enhanced in Ready-to-eat Lettuce Washed in Warm Water – PASCAL J. DELAQUIS, P. M. Toivonen, and S. Stewart, Agriculture and Agri-Food Canada, Pacific Agri-Food Research Centre, Summerland, British Columbia, Canada
- T5 A Survey of US Orchards to Identify Potential Sources of *Escherichia coli* O157:H7 – DENISE C. R. RIORDAN, G. M. Sapers, and B. A. Annous, USDA-ARS-ERRC, Wyndmoor, PA, USA
- T6 Attachment of *Escherichia coli* to the Epidermis and Internal Structures of Apples as Demonstrated by Confocal Scanning Laser Microscopy – SCOTT L. BURNETT, Jinru Chen, and Larry R. Beuchat, University of Georgia, Griffin, GA, USA
- T7 Quinolone Resistance among Clinical and Food Isolates of *Campylobacter* spp. – JEFFREY M. FARBER, Diane Medeiros, Greg Sanders, John Austin, Catherine Graham, Health Canada, Ottawa, Ontario, Canada
- T8 The Survival and Culturability of *Campylobacter jejuni* Micro-colonies under Modified Atmospheres at 4°C and 8°C Using a Model Food System – WENDY HARRISON, Adrian Peters, and Louise Fielding, University of Wales Institute, Cardiff, Wales, UK
- T9 Survival of *Campylobacter jejuni* in Biofilms Isolated from Chicken Houses – NATHANON TRACHOO, Joseph F. Frank, and Norman J. Stern, University of Georgia, Athens, GA, USA
- T10 Comparative Tolerance of *Salmonella* Typhimurium DT104 to Heat and Desiccation – ARTHUR J. MILLER, and Marsha H. Golden, Center for Food Safety and Applied Nutrition, FDA, Washington, D.C., USA
- T11 Routes of Infiltration, Survival, and Growth of *Salmonella enterica* Serovar Hartford and *Escherichia coli* O157:H7 in Oranges – MARK O. WALDERHAUG, Sharon G. Edelson-Mammel, Antonio J. DeJesus, B. Shawn Eblen, Arthur J. Miller, and Robert L. Buchanan, US FDA CFSAN, Washington, D.C., USA
- T12 A Descriptive Analysis of *Giardiasis* Cases Reported in Ontario, 1990-1997 – JUDY D. GREIG, Pascal Michel, Jeff B. Wilson, Scott A. McEwen, and Dean Middleton, Ontario Veterinary College, University of Guelph, Guelph, Ontario, Canada
- P1 Inactivation and Control Methods I**
(10:00 a.m. – 1:00 p.m.)
- P1 Cleaning Practices and the Cleanliness of Food Surfaces – CARYS DAVIES, Chris Griffith, and Adrian Peters, University of Wales Institute, Cardiff, UK
- P2 Evaluation of Household Cutting Board Clean-up Techniques – BARRY MICHAELS, Vidhya Gangar, Eric Meyers, Heidi Johnson, and Michael S. Curiale, Georgia Pacific Corp., Palatka, FL, USA

- P3 Ozone: An Alternative Disinfectant for the Food Industry – GINNY MOORE, Chris Griffith, and Adrian Peters, Food Safety Research Group, University of Wales Institute, Cardiff, UK
- P4 Removal of Microorganisms from Industrial Surfaces Using Peracetic Acid – LEO KUNIGK, Maria O. Portella, Maria C. B. Almeida, and Bernadette D.G.M. Franco, Escola de Engenharia Maua, Sao Caetano do Sul, Sao Paulo, Brazil
- P5 Efficacy of Two Sanitizers against Food Spoilage *Bacillus* Isolates – ESTER PETA, Denise Lindsay, and Alex von Holy, University of the Witwatersrand, Wits, South Africa
- P6 Effects of Cleaners of Biofouled Stainless-steel Surfaces in Yogurt Manufacturing Equipment – GUN WIRTANEN, Sami Kontulainen, and Satu Salo, VTT BioTech., Espoo, Finland
- P7 Influence of Processing Flow Velocity on Attachment Rates of *Pseudomonas fluorescens* Isolated from the Egg Industry – FABRICE BOURION, and T. Benezech, ASEPT, LAVAL cedex 9, France
- P8 Comparative Biocidal Capacities of Oxidative and Non-oxidative Sanitizers vs. *Listeria monocytogenes*, *Escherichia coli* O157:H7, and *Salmonella* Typhimurium Using a Modified Surface-dried Film Assay Method – CHARLES J. GIAMBRONE, George Diken, and Jonathan Lalli, FMC Corp., Princeton, NJ, USA
- P9 Ultrasound Cleaning in Cheese Mold Hygiene – GUN WIRTANEN, Antti Heino, and Satu Salo, VTT BioTech., Espoo, Finland
- P10 Evaluation of Cetylpyridinium Chloride Immersion as a Method to Reduce Pathogenic Bacteria – HONG WANG, Ming Ji, and Michael F. Slavik, University of Arkansas, Fayetteville, AR, USA
- P11 Attachment and Survival of *Salmonella stanley* on Cantaloupe Surface: Efficacy of Washing Treatments and Possibility of Transfer to Fresh-cut Tissues – D. O. UKUKU, and G. M. Sapers, USDA-ARS-ERRC, Wyndmoor, PA, USA
- P12 Combination of Chemical Treatments with Gamma Irradiation for Elimination of Foodborne Pathogens from Fresh Produce – DONALD E. CONNER, S. A. Berry, C. A. Sundermann, C. I. Wei, S. J. Weese, and F. M. Woods, Auburn University, Auburn, AL, USA
- P13 Inactivation of Bacterial Foodborne Pathogens on Fresh Produce Using Water-based Chemical Treatments – DONALD E. CONNER, S. A. Berry, C. A. Sundermann, C. I. Wei, S. J. Weese, and F. M. Woods, Auburn University, Auburn, AL, USA
- P14 Growth of *Escherichia coli* O157:H7 and Naturally Present Microorganisms in Heated Fresh-cut Lettuce – YUE LI, and Robert E. Brackett, University of Georgia, Griffin, GA, USA
- P15 Bactericidal Effect of Chlorine Dioxide against *Salmonella* spp., *Escherichia coli* O157:H7, and *Listeria monocytogenes* Inoculated on Apples and Lettuce – CHEN I-HSUAN, J. Kim, T. S. Huang, D. E. Conner, S. J. Weese, F. M. Woods, and C. I. Wei, Auburn University, Auburn, AL, USA
- P16 Modeling UV Inactivation of *Escherichia coli* in Apple Cider for Quantitative Risk Assessment – SIOBAIN MARIE DEIRDRE DUFFY, John Churey, Randy Worobo, and Donald Schaffner, Food Risk Analysis Initiative, Rutgers University, New Brunswick, NJ, USA
- P17 Efficacy of Surface Heat Treatment on Apples in the Production of Apple Cider – SUSANNE E. KELLER, Robert Merker, Stuart Chirtel, Carla Bator, and Tan Hsu Ling, FDA-CFSAN-DFPP, Summit-Argo, IL, USA
- P18 Fate of *Yersinia enterocolitica* on Sanitized Apples – ANA MARÍA STEFANINI DE GUZMÁN, and María Esther Escudero, Area Microbiología, Facultad de Química, Bioquímica y Farmacia, San Luis, Argentina
- P19 Assessment of the Microbial Efficacy of a Prototype GRAS Produce Wash on Apples – LINDA J. HARRIS, Charles A. Pettigrew, and Charles H. Taylor, University of California, Davis, Davis, CA, USA
- P20 Inactivation of *E. coli* O157:H7 and *Salmonella* in Apple Cider and Orange Juice by Ozone – ROBERT C. WILLIAMS, C. A. Iakins, D. A. Golden, and S. S. Sumner, University of Tennessee, Knoxville, TN, USA
- P21 Efficacy of Allyl Isothiocyanate in Killing Enterohemorrhagic *Escherichia coli* O157:H7 on Alfalfa Seeds – PETER J. TAORMINA, Chung-Myeon Park, and Larry R. Beuchat, University of Georgia, Griffin, GA, USA
- P22 Evaluation of Chemicals for Their Effectiveness in Killing *Salmonella* on Alfalfa Seeds – WILLIAM R. WEISSINGER, and Larry R. Beuchat, University of Georgia, Griffin, GA, USA
- P23 Factors Affecting the Thermal Inactivation of Bacteria in Poultry Products during Air Convection Cooking – BRADLEY P. MARKS, Rong Y. Murphy, Ellen R. Johnson, and Michael G. Johnson, Michigan State University, East Lansing, MI, USA
- P24 Fate of *Salmonella* spp. during Heating at Different Rates in Sous-vide Cooked Beef – VIJAY K. JUNEJA, and H. M. Marks, ERRC-USDA-ARS, Wyndmoor, PA, USA

(Monday morning, *continued*)

- P25 Survival of Inoculated *Escherichia coli* O157:H7 on Beef Jerky Dried at 62.5°C Following Four Preparation Treatments – JOHN N. SOFOS, S. N. Albright, and P. A. Kendall, Colorado State University, Fort Collins, CO, USA
- P26 Physical Variables and Yeast Inactivation during Thermo-ultrasonication – AURELIO LOPEZ-MALO, Universidad de las Americas-Puebla, Puebla, Mexico
- P27 Effects of Pulsed Electric Field Processing Using a Static Chamber on the Survival of *Listeria monocytogenes* – SADHANA RAVISHANKAR, Gregory J. Fleischman, Robert Tetzloff, Kenneth Ghiron, V. M. Balasubramaniam, and Rukma N. Reddy, The National Center for Food Safety and Tech., Illinois Institute of Tech., Summit-Argo, IL, USA
- P28 Inactivation of *Listeria monocytogenes* in Brine Chiller Water for Thermally Processed Meat Products Using a Recirculating Electrochemical Treatment System – JIANMING YE, Hong Yang, Hoi-Kyung Kim, Carl Griffis, and Yanbin Li, University of Arkansas, Fayetteville, AR, USA
- P29 Influence of Gamma Irradiation on *Salmonella* spp. Incorporated into Oysters – MARIZA LANDGRAF, M. Jakabi, D. S. Gelli, and M. T. Destro, Faculty of Pharmaceutical Sciences, University of Sao Paulo, Sao Paulo, Brazil
- P30 Loss of Crystal Violet Binding Activity in *Yersinia enterocolitica* Following Gamma Irradiation – CHRISTOPHER H. SOMMERS, USDA-ARS-NAA-ERRC-FS, Wyndmoor, PA, USA
- P31 Efficacy of Disinfectants in Killing Spores of *Alicyclobacillus acidoterrestris* and Performance of Media for Enumerating Survivors – LARRY R. BEUCHAT and Rachel V. Orr, University of Georgia, Griffin, GA, USA
- P32 Efficiency of Sanitation Procedures against *Listeria monocytogenes*: Application to Cold-smoked Fish Industry in France – FABRICE BOURION, and M. Gay, ASEPT, LAVAL cedex 9, France
- P33 Influence of Sodium Pyrophosphate on Thermal Inactivation of *Listeria monocytogenes* in Pork Slurry and Ground Pork – MAKUBA AIME LIHONO, Aubrey F. Mendonca, and James S. Dickson, Iowa State University, Ames, IA, USA
- P34 Aerobic Microflora and *Yersinia enterocolitica* Reductions on Eggs Treated with Different Sanitizers – ANA MARIA STEFANINI DE GUZMAN, Gabriela Favier, and Maria Esther Escudero, Area Microbiología, Facultad de Química, Bioquímica y Farmacia, San Luis, Argentina
- P35 Evaluation of Spray Application of Acidified Sodium Chlorite on Frankfurters and Its Effect on Reduction of *Listeria monocytogenes* – MAHA N. HAJMEER, James L. Marsden, Harshavardhan Thippareddi, Randall K. Phebus, Nahed Kotrola, and Kere Kemp, Kansas State University, Manhattan, KS, USA
- P36 Bactericidal and Bacteriostatic Effect of Bovine Lactoferrin and Its Pepsin Hydrolysate for Foodborne Pathogens – CHRISTOPHER ALLEN MURDOCK, and Karl R. Matthews, Rutgers University, New Brunswick, NJ, USA
- P37 Limitations in the Use of Ozone to Disinfect Maple Sap – RONALD LABBE, M. Kinsley, and J. Wu, University of Massachusetts, Amherst, MA, USA

**ALL DAY POSTER SYMPOSIUM –
MONDAY, AUGUST 7, 2000**

S5 Approaches to Control Pathogens in the Next Millennium

- Consumer Expectations and Response to Food Safety Technology – CHRISTINE BRUHN, University of California-Davis, Davis, CA, USA
- Beam Irradiation – JIM DICKSON, Iowa State University, Ames, IA, USA
- Gamma Irradiation – KATHLEEN T. RAJKOWSKI, USDA, ARS, ERRC, Wyndmoor, PA, USA
- Pasteurization of Intact Shell Eggs – W. J. STADELMAN, Purdue University, W. Lafayette, IN, USA
- Competitive Exclusion – J. STAN BAILEY, USDA, ARS, RRC, Athens, GA, USA
- Decontamination of Beef Carcass Surface Tissue by Steam Vacuuming Alone and Combined with Hot Water and Lactic Acid Sprays – GARY ACUFF, Texas A & M University, College Station, TX, USA
- Inactivation of Microorganisms by Pulsed Electric Fields: A Critical Review – G. V. BARBOSA-CANOVAS, Washington State University, Pullman, WA, USA
- Factors Affecting Ability of Microorganisms to Survive Microwave Cooking – SUSAN S. SUMNER, Virginia Tech, Blacksburg, VA, USA
- Integration of Semi-continuous High Pressure Processing with Aseptic Packaging – CHUCK SIZER, National Center for Food Safety and Technology, Summit Argo, IL, USA
- Plasma – DAVID GOLDEN, University of Tennessee, Knoxville, TN, USA

MONDAY AFTERNOON – AUGUST 7, 2000

(1:30 p.m. – 5:00 p.m.)

S6 *Listeria monocytogenes*: Current Issues and Concerns – Session II: Detection, Enumeration, and Intervention Strategies for *L. monocytogenes*

(Sponsored by ILSI-NA)

- A Comparison of Rapid Genetic Methods for the Detection of *L. monocytogenes* – ROY BETTS, Campden & Chorleywood Food Research Association, Gloucestershire, UK
- Ecology of *L. monocytogenes*: Studies on Incidence, Growth and Microbial Competition in Primary Production – DAVID R. FENLON, Scottish Agricultural College, Bucksburn, Aberdeen, Scotland
- Production Intervention Strategies to Control *L. monocytogenes*: Prospects for the Use of Irradiation (or Pasteurization) for Packaged Ready-to-Eat Meats – JAMES S. DICKSON, Iowa State University, Ames, IA, USA
- Production Intervention Strategies to Control *L. monocytogenes*: Barrier Technology and High Risk Production Area Control – JOHN T. HOLAH, Campden & Chorleywood Food Research Association, Gloucestershire, UK

S7 Current International Issues in Produce Safety

- Current Issues in Produce Safety – LINDA J. HARRIS, University of California-Davis, Davis, CA, USA
- Domestic and International Traceback Farm-Level Investigations – ART MILLER, FDA, CFSAN, Washington, D.C., USA
- Produce Safety – A Canadian Perspective – MARIE-CLAUDE THIBAUT, Canadian Produce Marketing Association, Ottawa, Ontario, Canada
- Government and Private Sector Programs to Improve Produce Safety in Mexico – ALEJANDRO CASTILLO, University of Guadalajara, Guadalajara, Jal., Mexico
- Education of U.S. Growers/Packers in Good Agricultural Practices – BOB GRAVANI, Cornell University, Ithaca, NY, USA
- Consumer Education/Perceptions of Produce Safety – CHRISTINE BRUHN, University of California-Davis, Davis, CA, USA

S8 Relevance of Testing to Reduce Risk

- Legal and Regulatory Implications of Testing – A Company Perspective – DAVID M. THENO, Foodmaker, Inc., San Diego, CA, USA

- Statistical Sampling – An Overview – RUSSELL FLOWERS, Silliker Labs, Inc., Homewood, IL, USA
- Scientific Advances to Improve Testing Strategies – LEE-ANN JAYKUS, North Carolina State University, Raleigh, NC, USA
- Statistical Sampling for Specific Foodborne Pathogens – TODD MCALOON, Cargill, Inc., Minneapolis, MN, USA
- The Impact of Sampling Strategies on Risk Analysis and Risk Mitigation – DONALD SCHAFFNER, Rutgers University, New Brunswick, NJ, USA

S9 HACCP-based Strategies for Cooked Ready-to-eat Seafoods Based on Quantitative Risk Assessment

- C.D.C. Data on Infection and Diseases Caused by Cooking and Ready-to-eat Seafoods – ROBERT TAUXE, CDC, Atlanta, GA, USA
- FDA's Update on Compliance with Seafood HACCP Regulations and Their Policy for Handling and Storing Cooked and Ready-to-eat Seafoods – BOB BECKER, Mobile, AL, USA
- HACCP-based Post-cook Handling and Storage Options for Cooked Ready-to-eat Seafood Products – MIKE MOODY, Louisiana State University, Baton Rouge, LA, USA
- Growth Patterns of Pathogenic Microbes in Cooked and Ready-to-eat Seafoods Using Optional Processing Strategies – GEORGE J. FLICK, Virginia Tech., Blacksburg, VA, USA
- Gulf Blue Crab HACCP Economics: Proposed and Actual Effects – BRIAN PERKINS, Auburn University, Mobile, AL, USA

T2 Microbiological Methods

- T13 Development of a Standard Method to Detect Parasitic Protozoa on Fresh Vegetables – NOREEN WILKINSON, C. A. Paton, R. A. B. Nichols, N. Cook, and H. V. Smith, Central Science Laboratory, York, UK
- T14 Development of Custom Identification Patterns for *Salmonella* Based on the Use of the Restriction Enzyme PvuII with an Automated Ribotyping System – JAMES L. BRUCE, Elizabeth Mangiaterra, and Timothy R. Dambaugh, Qualicon, Inc, Wilmington, DE, USA
- T15 The Development and Testing of an Instrument for the Homogeneous Detection of PCR Products – W. MARK BARBOUR and George Tice, Qualicon Inc., Wilmington, DE, USA

(Monday afternoon, *continued*)

- T16 Evaluation of Immuno-concentration Procedure to Detect Salmonellae in Poultry Samples – J. STAN BAILEY, and Doug E. Cosby, USDA-ARS-RRC, Athens, GA, USA
- T17 Rapid Enumeration of *Lactobacillus* spp. in Salad Dressings Using the BioSys – LORALYN H. LEDENBACH, and Paul A. Hall, Kraft Foods, Inc., Glenview, IL, USA
- T18 Paper Kits for the Rapid Enumeration of Total and Coliforms/*E. coli* – PRAVATE TUITEMWONG, Sujira Manecrat, Koorance Tuitemwong, and Warapa Mahakarnchanakol, Food Science & Tech., KMUT Thonburi, Bangkok, 10140, Thailand
- T19 Inoculum Size of *Clostridium botulinum* 56A Spores Influences Time-to-detection and Percent Growth-positive Samples – LIHUI ZHAO, Thomas J. Montville, and Donald W. Schaffner, Cook College/Rutgers University, New Brunswick, NJ, USA
- T20 Estimating the Growth of *Listeria monocytogenes* and *Yersinia enterocolitica* Micro-colonies under Modified Atmospheres at 4°C and 8°C Using a Model Food System – WENDY ANNE HARRISON, Adrian Peters, and Louise Fielding, Food Safety Research Group, University of Wales Institute, Cardiff, South Glamorgan, Wales, UK
- T21 The Development of a Quantitative Assay for the Detection of Genetically Modified Soy Protein – SCOTT J. FRITSCHER, Mark A. Jensen, Susan Y. Tseng and Gregory Elliott, Qualicon, Inc., Wilmington, DE, USA
- T22 A Comparison of the Traditional Three-tube Most Probable Number (MPN) Method with the Petrifilm, SimPlate, Bactometer Conductance, and BioSys Optical Methods for Enumerating *Escherichia coli* from Broiler Carcasses and Ground Beef – SCOTT M. RUSSELL, University of Georgia, Athens, GA, USA
- T23 Evaluation of the BioSys Optical Method for Rapidly Enumerating Populations of Aerobic Bacteria, Coliforms, and *Escherichia coli* (*E. coli*) from Ground Beef – SCOTT M. RUSSELL, University of Georgia, Athens, GA, USA
- T24 A Survey of *Campylobacter* Diversity in Poultry Samples Using a Network of Automated Ribotyping Systems with the Restriction Enzyme PstI – JAMES L. BRUCE, S. J. Fritschel, N. J. Stern, J. Van Der Plas, M. Havekes, H. Rahaoui, D. Koster, P. De Boer, J. Wagenaar, and W. Jacobs-Reitsma, Qualicon Inc., Wilmington, DE, USA
- P2 Inactivation and Control Methods II**
(3:00 p.m. – 6:00 p.m.)
- P38 Effect of Freezing on the Isolation and Survival of Plasmid-bearing Virulent *Yersinia enterocolitica* in Pork – SAUMYA BHADURI, USDA-ARS-NAA-ERRC, Wyndmoor, PA, USA
- P39 Effect of Growth Temperature or Starvation on the Radiation Resistance of *Escherichia coli* O157:H7 in a Model System and Ground Beef – ELAD I. STOTLAND, A. F. Mendonca, J. S. Dickson, and D. G. Olson, Iowa State University, Ames, IA, USA
- P40 Susceptibilities of *Staphylococcus aureus*, *Listeria* and *Salmonella* Isolates Associated with Poultry Processing to Six Antimicrobial Agents – ALEX VON HOLY, and Ifigenia Geornaras, University of the Witwatersrand, Wits, South Africa
- P41 Invasive Ability and Tolerance of Acid-adapted and Non-adapted *Salmonella* Typhimurium DT104 to Stress Conditions – PINA M. FRATAMICO, USDA-ARS-ERRC, Wyndmoor, PA, USA
- P42 Heat Adaptation Induced Cross-protection against Osmotic Stress in *Salmonella* Typhimurium DT104 – SUREE NANASOMBAT, and Joseph Frank, University of Georgia, Athens, GA, USA
- P43 Multiple Stress Studies in *Arcobacter* Species – D'SA ELAINE M., M. A. Harrison, and V. K. Juneja, University of Georgia, Athens, GA, USA
- P44 Influence of Fruit Variety, Harvest Technique, Culling, and Storage on the Microbial Composition and Patulin Contamination of Unpasteurized Apple Cider – ROBERT I. MERKER, Suzanne Keller, Hsu Ling Tan, Stuart Chirtel, Kirk Taylor, Lauren Jackson, and Arthur Miller, FDA/CFSAN/OSRS, Washington, D.C., USA
- P45 Organic Acids and Hydrogen Peroxide Inhibit Microbial Viability in Fresh Juices – KALI KNIEL PHELPS, J. Koontz, S. S. Sumner, D. A. Golden, C. R. Hackney, and B. W. Zoecklin, Virginia Tech., Blacksburg, VA, USA
- P46 Survival of Enterohemorrhagic *Escherichia coli* O157:H7 Strains in Wounded Apple Tissue during Temperature Abuse – MARLENE E. JANES, Shorch Kooshesh, Rama Nannapaneni, and Michael G. Johnson, University of Arkansas, Fayetteville, AR, USA
- P47 Loss of Fumonisin during the Corn Flake Process with and without Sugars – MAURICIO M. CASTELO, and Lloyd B. Bullerman, University of Nebraska-Lincoln, Lincoln, NE, USA

- P48 Peroxidative Stress Adaptation and Thermal Cross-resistance in *Escherichia coli* O157:H7 933 Subjected to Sublethal Doses of Peroxyacetic Acid Sanitizer – C. D. ZOOK, F. F. Busta, and L. J. Brady, University of Minnesota, St. Paul, MN, USA
- P49 Effect of Inhibitors of Branched-chain Keto Acid Dehydrogenase on the Growth, Fatty Acid Composition, and Enzyme Activity of *Listeria monocytogenes* – BRIAN JAMES WILKINSON, Tonia Wooldridge, Thanoja Sirimanne, Pascal Drouin, David Labeda, and Philip D. Morse, II, Illinois State University, Normal, IL, USA
- P50 *Zygosaccharomyces bailii* Time-to-growth as Affected by Temperature, Water Activity, pH and Antimicrobials – ENRIQUE PALOU, and A. Lopez-Malo, Universidad de las Américas-Puebla, Puebla, Mexico
- P51 Effect of Salt on Survival of *Shigella flexneri* as Affected by Temperature and pH – LAURA L. ZAIKA, USDA-ARS-NAA-ERRC, Wyndmoor, PA, USA
- P52 Use of Polystyrene Foam Net Containing Silver-coated Ceramic to Extend Shelf Life of Long-issimus Steaks from Korean Cattle – JONG-BANG EUN, Hyung Jung Kim, and Chanyoung Park, Chonnam National University, Kwangju, South Korea
- P53 Impact of Heating Stress on the Behavior of Two *Listeria monocytogenes* Strains in a Broth which Mimics the Camembert Cheese Composition – EMMANUELLE HELLOIN, Marielle Gay, and Françoise Ergon, ASEPT, 53020 Laval Cedex 9, France, France
- P54 Unrelatedness of Nisin Resistance and Antibiotic Resistance in *Listeria monocytogenes* – THOMAS J. MONTVILLE, Michael Chikindas, Jennifer Cleveland, and Jie Li, Cook College, New Brunswick, NJ, USA
- P55 Changes in Populations and Acid Tolerance of *Listeria monocytogenes* in Fresh Beef Decontamination Fluids – JOHN SAMELIS, J. N. Sofos, P.A. Kendall, and G. C. Smith, Colorado State University, Fort Collins, CO, USA
- P56 Evaluation of *Listeria monocytogenes* in Vacuum-packed Gravada Salmon – MARIZA LANDGRAF, E. M. Kinoshita, F. A. Silvestre, and M. T. Destro, University of Sao Paulo, Sao Paulo, Brazil
- P57 Fate of *Escherichia coli* O157:H7 in Channel Catfish Pond Water – RICO SUHALIM, Y. W. Huang, and G. Burtle, University of Georgia, Athens, GA, USA
- P58 Internalization of *Escherichia coli* Outside Laboratory Conditions – BROOKE SEEMAN, K. K. Phelps, and S. S. Sumner, Virginia Tech, Blacksburg, VA, USA
- P59 Localization and Tissue Damage Induced by Enterohemorrhagic *Escherichia coli* O157:H7 in Apple Tissue – MARLENE E. JANES, Rama Nannapaneni, and Michael G. Johnson, University of Arkansas, Fayetteville, AR, USA
- P60 Modeling the Survival of Enterohemorrhagic *Escherichia coli* in Uncooked Fermented Salami – DIANE S. WOOD, Mansel W. Griffiths, Shai Barbut, and Trevor Pond, Canadian Research Institute for Food Safety, Guelph, Ontario, Canada
- P61 Growth of *Escherichia coli* O157:H7 in Biofilms with Microorganisms Isolated from Meat Processing Environments – DONG KWAN JEONG, K. Y. Park, and J. S. Lee, Kosin University, Pusan, Korea
- P62 Growth and Survival of *Escherichia coli* O157:H7 and Nonpathogenic *E. coli* in Cheddar Cheese Curds – KATHLEEN A GLASS, Ann Larson, Angelique Smith, Kendra Thornton, and Eric A. Johnson, University of Wisconsin-Madison, Food Research Institute, Madison, WI, USA
- P63 Survival of Enterohemorrhagic *Escherichia coli* O157:H7 in Retail Mustard – CAROLYN M. MAYERHAUSER, Reckitt Benckiser, Montvale, NJ, USA
- P64 Environmental Conditions Affecting Survival of *Escherichia coli* O157:H7 and *Salmonella* Typhimurium DT104 in Land-spread Manure – ANTHONY RICHARD ARMENT, and Steven C. Ingham, University of Wisconsin, Madison, WI, USA
- P65 Effect of Antacid on Survival of *Vibrio vulnificus* and *Vibrio vulnificus* Phage in a Simulated Gastrointestinal Model – JAHEON KOO, Angelo DePaola, and Douglas L. Marshall, Virginia Seafood Agricultural Research and Extension Center, Hampton, VA, USA
- P66 Survival of *Vibrio vulnificus* in Raw and Fried Mussels (*Mytilus galloprovincialis*) being Consumed as Traditionally in Turkey – GURHAN CIFTCIOGLU, and Acar M. Susur, Istanbul University, School of Veterinary Medicine, Avcilar, Istanbul, Turkey
- P67 Microbial Population, Chemical Status and Shelf Stability of Smoked and Non-smoked Country-cured Hams – SUSANA M. PORTOCARRERO, M. Newman, B. Mikel, and B. Moody, University of Kentucky, Lexington, KY, USA

(Monday afternoon, *continued*)

- P68 Fate of Bacterial Pathogens Inoculated on Fresh Pork during Simulated Temperature Abuse at Distribution – JOHN N. SOFOS, K. Segomelo, M. L. Kain, G. Bellinger, K. E. Belk, J. Scanga, and G. C. Smith, Colorado State University, Fort Collins, CO, USA
- P69 Cooling Rate Effect on Outgrowth of *Clostridium perfringens* in Cooked Turkey Products – FROST M. STEELE, and Kevin H. Wright, Brigham Young University, Provo, UT, USA
- P70 Comparing Attachment Strength, Heat Tolerance and Alkali Resistance of Pathogenic and Non-pathogenic Bacteria on Orange Surfaces – STEVEN PAO, and Craig L. Davis, Florida Dept. of Citrus, Lake Alfred, FL, USA
- P71 Potential for Transference of Inoculated and Indigenous Bacteria from the Non-wounded Rind of Melons to the Interior Edible Flesh – TREVOR V. SUSLOW, M. Zuñega, J. Wu, L. J. Harris, and T. Parnell, University of California, Davis, CA, USA
- P72 Survival of Poliovirus on Fresh Produce – NIGEL COOK, A. S. Kurdziel, and N. Wilkinson, Central Science Laboratory, York, UK

TUESDAY MORNING – AUGUST 8, 2000

(8:30 a.m. – 12:00 p.m.)

S10 *Campylobacter* Performance Standards: Implementation and Control

(Sponsored by IAFP Foundation Fund)

- Update on FSIS *Campylobacter* Programs – GERALDINE RANSON, USDA Food Safety and Inspection Service, Washington, D.C., USA
- Control of *Campylobacter* in Poultry from Farm to Table – ERIC LINE, USDA-ARS-RRC, Athens, GA, USA
- Control of *Campylobacter* in Pork from Farm Through Slaughter – JAMES S. DICKSON, Iowa State University, Ames, IA, USA
- Current *Campylobacter* Research Needs on Behalf of Public Health – F. J. (ERIC) BOLTON, Central Public Health Laboratory, London, UK
- Perspectives and Possibilities for *Campylobacter* Performance Standards – NORMAN J. STERN, USDA-ARS-RRC, Athens, GA, USA

S11 Genetic Methods to Track Microorganisms in Food Production and Processing

- Advantages and Disadvantages of Different Genetic Techniques – MARTIN WIEDMANN, Cornell University, Ithaca, NY, USA
- Interpreting Genetic Results - What do the Results Mean? – TIM BARRETT, CDC, Atlanta, GA, USA

- Tracking *E. coli* O157:H7 in Wisconsin Dairy Farms – JACK SHERE, University of Wisconsin, Madison, WI, USA
- Tracking *Campylobacter* in Poultry Production and Processing – KELLI HIETT, USDA-ARS-RRC, Athens, GA, USA
- Using Genetic Tests to Understand Microbial Ecology of Food Production Systems – JOSEPH MEYER, Kraft Foods, Glenview, IL, USA
- Monitoring Changes in Microbes Used in Food Production and Fermentation Systems Using Genetic Methods – MIKE BARNEY, Miller Brewing Company, Milwaukee, WI, USA

S12 Issues Facing Today's Large Dairy Producers

- Management Issues of Expanding an Operation – RON ST. JOHN, Producer, Trenton, FL, USA
- Nutrient Management and Waste Issues – JOHN WORLEY, University of Georgia, Athens, GA, USA
- Design of Milking Center and Other Buildings – BILL BICKERT, Dairy Faculty Ag Engineering, East Lansing, MI, USA
- Decisions in Choosing a Milking System – To be announced
- Employee and Labor Issues – WILLIAM THOMAS, University of Georgia Extension Service, Athens, GA, USA
- Dairy Farming and Environment Regulatory Issues – CARISSA ITLE, National Milk Producers Federation, Arlington, VA, USA

S13 Approaches to Food Safety in Latin America and Caribbean Countries

- Surveillance of Foodborne Diseases in Countries of Latin America and the Caribbean with Emphasis in Emerging Pathogens – JAMES ESTUPIAN, Pan America Institute for Food Protection and Zoonoses
- Food Safety Approaches in Latin America and the Caribbean – JAIRO ROMERO, Asociacion Colombiana de Ciencias y, Colombia
- Latin America Network of Food Analysis Laboratories – MARITZA COLLON PULANO, FDA
- Food Safety Initiative in Caribbean Countries – RONALD GORDON, CARICOM Secretariat
- Food Safety Aspects of Meat Exportation from Latin America and the Caribbean – To be announced
- Food Safety Aspects of Fruits and Vegetables Exportation from Latin America and the Caribbean – JAIME ALMONTE

T3 Inactivation and Control Methods I

- T25 Inactivation of Bacterial Foodborne Pathogens on Fresh Produce by Low-dose Gamma Irradiation – DONALD E. CONNER, S. A. Berry, C. A. Sundermann, C. I. Wei, S. J. Weese, and F. M. Woods, Auburn University, Auburn University, AL, USA
- T26 Effect of Irradiation Temperature on Inactivation of *E. coli* O157:H7 and *Staphylococcus aureus* – DONALD W. THAYER, and Glenn Boyd, USDA-ARS-ERRC, Wyndmoor, PA, USA
- T27 Non-thermal Processing Alternatives for the Effective Elimination of *E. coli* O157:H7 in Apple Cider – NESE BASARAN, John Churey, and Randy W. Worobo, Cornell University, Geneva, NY, USA
- T28 Inactivation of *Escherichia coli* O157:H7 and *Listeria monocytogenes* on Apples and in Fresh Apple Cider Using Sonication and Copper Ion Water – STEPHANIE L. RODGERS, J. N. Cash, and E. T. Ryser, Michigan State University, East Lansing, MI, USA
- T29 Influence of Environmental Stresses on Biocide Susceptibility of *Escherichia coli* O157:H7 – KAREN ELIZABETH MIDDLETON, Michael P. Whitehead, David J. Hill, John T. Holah and Hazel Gibson, University of Wolverhampton, School of Applied Sciences, Wolverhampton, England
- T30 Inhibition of *Listeria monocytogenes*, *Salmonella* Typhimurium DT104 and *Escherichia coli* O157:H7 on Bologna and Summer Sausage Using Whey Protein Isolate-based Edible Films Containing Antimicrobials – ARZU CAGRI, Z. Ustunol, and E. Ryser, Michigan State University, East Lansing, MI, USA
- T31 Disinfection of Bacterial Pathogens and Selected Viruses on Fresh Romaine Lettuce – MICHAEL LEE BRADLEY, George Lukasik, and Samuel Farrah, University of Florida, Gainesville, FL, USA
- T32 The Antimicrobial Efficacy of Herbs in Marinated Chicken – MONDONNA F. CATE, F. A. Draughon, J. R. Mount, and D. A. Golden, University of Tennessee, Knoxville, TN, USA
- T33 Effect of Fat Content, Evaporative Cooling and Food Type on Pathogen Survival during Microwave Heating – APRIL HIX, S. Sumner, K. Mallikarjunan, and C. Hackney, Virginia Tech, Blacksburg, VA, USA
- T34 Microbiological Evaluation and Manufacturing Practices of Sprouts in Canada – MARIA NAZAROWEC-WHITE, F. Veillette, and I. Laberge, Canadian Food Inspection Agency, Nepean, Ontario, Canada
- T35 Effect of Blanching Cucumbers on the Microflora of Non-acidified Refrigerated Pickles – FREDERICK BREIDT, JR., L. Reina, and H. P. Fleming, North Carolina State University, Raleigh, NC, USA
- T36 Effects of Water Washing and Rinsing Temperature on Handwashing Efficacy – BARRY MICHAELS, Vidhya Gangar, Maria Arenas, Ann Schultz, and Daryl Paulson, Georgia Pacific Corp., Palatka, FL, USA

P3 General Food Microbiology and Education

(10:00 a.m. – 1:00 p.m.)

- P73 Cytotoxicity and Buffering Capacity of an Alkaline Tolerant Dairy-associated *Bacillus* Isolate – DENISE LINDSAY, Volker Brözel, and Alex von Holy, University of the Witwatersrand, Wits, South Africa
- P74 Two Novel Genes Related to Low Temperature Growth of *Listeria monocytogenes* as Identified Using Transposon-induced Cold Sensitive Mutants cld-14 and cld-27 – SIQING LIU, Philip D. Morse II, and Brian J. Wilkinson, Illinois State University, Normal, IL, USA
- P75 Transposon Insertions in Branched-chain Alpha-keto Acid Dehydrogenase Region of Two Cold-sensitive *Listeria monocytogenes* Mutants – KUN ZHU, Anming Xiong, R. K. Jayaswal, Philip D. Morse II, and Brian J. Wilkinson, Illinois State University, Normal, IL, USA
- P76 A Risk-based Evaluation of Traditional and Social Marketing Methods of Food Hygiene Education – ELIZABETH CLAIRE REDMOND, C. Griffith and A. Peters, Food Safety Research Group, University of Wales Institute, Cardiff, Cardiff, South Glamorgan, Wales, UK
- P77 Foodborne Disease Reporting in America: Closing the Gaps in Our Federal Food-safety Net – CAROLINE SMITH DEWAAL, Lucy Alderton, and Michael Jacobson, Center for Science in the Public Interest, Food Safety Program, Washington, D.C., USA
- P78 Food Handlers' Beliefs about Food Safety Procedures and Risks – DEBBIE CLAYTON, Chris Griffith, Adrian Peters, and Patricia Price, University of Wales Institute, Cardiff, UK
- P79 The Repeatability and Reproducibility of Food Safety Behavior in the Domestic Environment – ELIZABETH CLAIRE REDMOND, C. Griffith, and A. Peters, Food Safety Research Group, University of Wales Institute, Cardiff, South Glamorgan, Wales, UK

(Tuesday morning, *continued*)

- P80 Prevalence of Unsafe Practices during Preparation of Homemade Food in Argentina – ALICIA NOEMÍ CALIFANO, Graciela De Antoni, Leda Gianuzzi, and Rodolfo Mascheroni, CIDCA, Universidad Nacional de La Plata, Facultad de Ciencias Exactas, La Plata, Buenos Aires, Argentina
- P81 Evaluation of a Targeted Intervention Food Safety Program for Women Who are Pregnant and/or Have Young Children – JODI R. BUNDE, and Virginia N. Hillers, Oregon State University, Corvallis, OR, USA
- P82 Cost, Benefits and Attitudes Towards HACCP Implementation in English Butchers' Shops – ADRIAN PETERS, Matthew Mortlock, and Chris Griffith, University of Wales Institute, Cardiff (UWIC), Cardiff, England
- P83 Development of a Competitive Exclusion Product to Reduce *Escherichia coli* O157:H7 in Cattle – DIVYA JARONI, Mindy Brashears and Joy Trimble, University of Nebraska, Lincoln, NE, USA
- P84 Isolation and Selection of Lactic Acid Bacteria from Meat Products to Inhibit Foodborne Pathogens – ALEJANDRO AMEZQUITA, Mindy Brashears, and Joy Trimble, University of Nebraska-Lincoln, Lincoln, NE, USA
- P85 Biocontrol of Mold Growth Using *Bacillus pumilus* and *Lactobacillus* Species Isolated from Foods – JITKA STILES, C. Munimbazi, M. Plockova, J. Chumchalova, and L. B. Bullerman, University of Nebraska-Lincoln, Lincoln, NE, USA
- P86 Employing *Citrobacter rodentium* as a Surrogate for *E. coli* O157:H7 in a Mouse Model to Investigate the Effects of the Probiotic *L. acidophilus* on Pathogen Binding in the Large Intestine – JEFFREY J. VARCOE, Frank Busta, and Linda Brady, University of Minnesota, St. Paul, MN, USA
- P87 Purification and Characterization of an Antilisterial Bacteriocin Produced by *Leuconostoc* sp. W65 – SEJONG OH, John J. Churey, Sachun Kim, and Randy W. Worobo, Cornell University, Geneva, NY, USA
- P88 Resistance of *Listeria monocytogenes* to Bacteriocins of Lactic Acid Bacteria – ANNE BOUTTEFROY, and Jean-Bernard Milliere, ASEPT, 53020 Laval Cedex 9, France, France
- P89 Botulinal Toxin Production in Reduced-fat and Fat-free Pasteurized Process Cheese Products – KATHLEEN A. GLASS, and Eric A. Johnson, Food Research Institute, UW-Madison, Madison, WI, USA
- P90 Antimicrobial Activity of Several Spices and Organic Acid Solutions Tested against *Arcobacter butzleri* – ROBERT TODD HANCOCK, and Mark A. Harrison, University of Georgia, Athens, GA, USA
- P91 Trans-2-Hexenal, as an Antimicrobial Agent – MELISSA C. NEWMAN, and M. A. Anandappa, University of Kentucky, Lexington, KY, USA
- P92 Carvacrol, Citral, Eugenol, Thymol, Vanillin, Potassium Sorbate and Sodium Benzoate Inhibitory Concentrations for *Aspergillus flavus* at Selected Water Activities and pHs – AURELIO LÓPEZ-MAÍLO, and S. M. Alzamora, Universidad de las Americas-Puebla, Puebla, Mexico
- P93 Antimicrobial Effect of Honey on Hydrated Batter Mix – YAO-WEN HUANG, H.Y. Chu and M. Harrison, University of Georgia, Athens, GA, USA
- P94 Natural Antimicrobials as Potential Replacements for Calcium Propionate in Bread – ALEX VON HOLY, and Tracey-Lee Pattison, University of the Witwatersrand, Wits, South Africa
- P95 Effect of Natural Antimicrobials on Bakers' Yeast – ALEX VON HOLY, and Tracey-Lee Pattison, University of the Witwatersrand, Wits, South Africa
- P96 Prevalence of *Pseudomonas* spp. in Process Water, Recycled Water and Dairy Products – JILL GEBLER, Murray Goulburn Co-op Co. Ltd, Yarram, VICTORIA, Australia
- P97 Population Changes of Pathogenic Bacteria Inoculated in Fresh Pork Following Chilled Storage and Simulated Consumer Temperature Abuse – JOHN N. SOFOS, K. Segomelo, M. L. Kain, G. Bellinger, K. E. Belk, J. Scanga, and G. C. Smith, Colorado State University, Fort Collins, CO, USA
- P98 Prevalence of *Listeria monocytogenes*, *Salmonella* Typhimurium and *Yersinia enterocolitica* on Incoming Hogs and Fresh Pork during and after Slaughter – RAJESH K. SHARMA, Elliot T. Ryser, and Wesley N. Osburn, Michigan State University, East Lansing, MI, USA
- P99 Levels of Microbial Contamination in United States Pork Retail Products – ELIZABETH ANNE DUFFY, G. R. Bellinger, A. Pape, K. E. Belk, J. N. Sofos, and G. C. Smith, Colorado State University, Fort Collins, CO, USA
- P100 Microbial Contamination Occurring on Lamb Carcasses Processed in the United States – ELIZABETH ANNE DUFFY, S. B. LeValley, M. L. Kain, K. E. Belk, J. N. Sofos, J. D. Tatum, G. C. Smith, and C. V. Kimberling, Colorado State University, Fort Collins, CO, USA
- P101 Sampling of Dairy Cattle for *Listeria monocytogenes* – MATTHEW R. EVANS, Valerie W. Ling, F. Ann Draughon, and Stephen P. Oliver, University of Tennessee, Knoxville, TN, USA

- P102 Incidence and Antibiotic Resistance of *Salmonella* spp. Cultures Isolated from Animal Hide and Beef Carcasses – RICHARD TODD BACON, John N. Sofos, Keith E. Belk, and Gary C. Smith, Colorado State University, Fort Collins, CO, USA
- P103 Surveillance of *Arcobacter* in Various Environmental Sources – LEE G. JOHNSON, and Elsa Murano, Texas A&M University, College Station, TX, USA
- P104 Presence of *Campylobacter*, *Escherichia coli* and *Salmonella* in Retail Meats – CUIWEI ZHAO, B. Ge, J. De Villena, R. Sudler, E. Yeh, and J. Meng, University of Maryland, College Park, MD, USA
- P105 Antibiotic Resistance Pattern of *Campylobacter* spp. Isolated from Boilers Processed in Air and Immersion Chill Processing Facilities – MARCOS XAVIER SANCHEZ, W. M. Fluckey, M. Brashears, and S. R. McKee, University of Nebraska, Lincoln, NE, USA
- P106 Characterization of Antibiotic Resistance in Shiga Toxin-producing *Escherichia coli* – SHAOHUA ZHAO, D. White, S. Ayers, S. Friedman, B. Ge, J. Meng, L. English, D. Wagner, and S. Gaines, FDA, Laurel, MD, USA
- P107 Evidence of Toxin Production by *Bacillus* Strains Isolated from Street-vended Foods in Johannesburg, South Africa – ALEX VON HOLY, Francina Mosupye, and Denise Lindsay, University of the Witwatersrand, Wits, South Africa
- P108 Microbiological Quality of Bottled Water – HASSAN GOURAMA, Lynette Heffner, and Lauren Anton, Pennsylvania State University, Reading, PA, USA
- P109 Identification and Molecular Characterization of Amine-producing Strains of *Stenotrophomonas maltophilia* Isolated from White Muscle of Fresh and Frozen Albacore Tuna (*Thunnus alalunga*) – JORGE BARROS-VELÁZQUEZ, Begoña Ben-Gigirey, Juan M. Vieites, and Tomás G. Villa, University of Santiago de Compostela, Lugo, Lugo, Spain
- P110 Microbial Ecology of Muffins Based on Cassava and Other Non-wheat Flours – ALEX VON HOLY, Shobna Chauhan, Christine Rey, and Denise Lindsay, University of the Witwatersrand, Wits, South Africa

TUESDAY AFTERNOON – AUGUST 8, 2000

1:30 p.m. – 5:00 p.m.

General Session (1:30 p.m. – 3:30 p.m.)

Bioterrorism and Food Protection

- Strategic Bioterrorism and the Food Supply – Raymond Harbison, University of South Florida, Tampa, FL, USA
- Bioterrorism as a Public Health Event – Scott Lillibridge, CDC, Atlanta, GA, USA
- Bioterrorist Targets in the Agricultural Industry – DALE HANCOCK, Washington State University, Pullman, WA, USA
- Medical Implications of a Foodborne Bioterrorist Event – RICHARD LEE, SUNY, Buffalo, NY, USA
- Responding to a Bioterrorist Event – GARY HURST, US Army, USA
- The Role of Food Protection Organizations in Contributing to Preparedness Against Bioterrorist Events – ANN DRAUGHON, University of Tennessee, Knoxville, TN, USA

Business Meeting (4:00 p.m. – 5:00 p.m.)

WEDNESDAY MORNING – AUGUST 9, 2000

(8:30 a.m. – 12:00 p.m.)

S15 Food Biotechnology: Perspectives, Challenges and Opportunities

- Perspectives on Biotechnology: Past, Present and Future – MICHAEL PHILLIPS, Biotechnology Industry Organization, Washington, D.C., USA
- Understanding Consumer Perceptions of Biotechnology – SYLVIA ROWE, International Food Information Council, Washington, D.C., USA
- Biotechnology in Production Agriculture: A Scientific Perspective – MARTINA MCGLOUGHLIN, University of California-Davis, Davis, CA, USA
- The Environmental Impact of Biotechnology – JANET ANDERSEN, US Environmental Protection Agency, Washington, D.C., USA
- Food Product Enhancement through Biotechnology – CHARLES ARNTZEN, Cornell University, Ithaca, NY, USA
- Detecting Biotechnologically Derived Ingredients in Food – JEFFREY T. BARACH, National Food Processors Association, Washington, D.C., USA

S16 Biosensors and Real Time Detection Systems

- Fundamentals of Biosensors and Real-Time Detection Systems – ROBERT BRACKETT, FDA, Washington, D.C., USA
- Use of Colorimetric Sensors for Detection of Foodborne Pathogens – PETER DAVID, DTEK, Los Altos Hills, CA, USA

(Wednesday morning, *continued*)

- Rapid Detection of *Salmonella* Using an Immunoassay-based Biosensor – DAVID S. GOTTFRIED, Georgia Tech Research Institute, Atlanta, GA, USA
- Detection of Pathogens by Immunomagnetic-electrochemiluminescence (IM-ECL) – GERRY CRAWFORD, USDA-REE-ARS-NAA-ERRC-MB&BR, Wyndmoor, PA, USA
- Application of Flow Cytometry Techniques as Real Time Detectors – ERIC JOHNSON, University of Wisconsin, Madison, WI, USA
- Integration and Application of Real Time Detection and Information Systems for Food Safety – DONALD CONNER, Auburn University, Auburn, AL, USA

S17 Transportation of Raw Milk and Finished Dairy Products

- Regulating Haulers/Drivers – MIKE CULPEPPER, Georgia Dept. of Ag., Atlanta, GA, USA
- Inspection of Farm Bulk Tankers – DAN ERICKSON, Minnesota Dept. of Ag., St. Paul, MN, USA
- Cleaning and Sanitizing Farm Bulk Tankers – PATRICK BOYLE, Readington Farms, Inc., Whitehouse, NJ, USA
- Sampling Issues – MIKE CULPEPPER, Georgia Dept. of Ag., Atlanta, GA, USA
- Owner/Operator Issues – RICK BAREFOOT, H. Fred Barefoot Trucking, Inc., Alum Bank, PA, USA
- Hauling of Finished Dairy Products – RUTH FUQUA, Quality Check Dairies Inc., Mt. Juliet, TN, USA

S18 Significance of Mycotoxins in the Global Food Supply

(Sponsored by ILSI-NA)

- Worldwide Mycotoxin Problems – J. DAVID MILLER, Carleton University, Ottawa, Ontario, Canada
- Aflatoxins – To be announced
- Fumonisin – WILLIAM P. NORRED, USDA-ARRC, Athens, GA, USA
- Deoxynivalenol – JAMES J. PESTKA, Michigan State University, East Lansing, MI, USA
- Detection Methods for Mycotoxins in Foods – ANGELO VISCONTI, National Research Council, Bari, Italy
- Control of Mycotoxins in the Food Supply: A Food Industry Perspective – To be announced

T4 Inactivation and Control Methods II

- T37 Continuous On-line Processing of Fecal and Food Contaminated Poultry Carcasses – G. KERE KEMP, M. A. Aldrich, and M. Guerra, Alcide Corp., Redmond, WA, USA
- T38 Efficacy of Electrolyzed Water in Inactivating *Listeria monocytogenes* and *Salmonella enteritidis* on Shell eggs – YEN-CON HUNG, Chung-Myeon Park, Chyi-Shen Lin, and Robert E. Brackett, CFSQE, University of Georgia, Griffin, GA, USA
- T39 Effect of Pre-chill Skinning on the Level of *Campylobacter* Recovered from Broiler Parts – MARK E. BERRANG, and S. R. Ladely, USDA-ARS-Russell Research Center, Athens, GA, USA
- T40 Ability of Oleic Acid to Reduce the Number of Bacteria on Poultry Skin and in Rinsates of Poultry Skin – ARTHUR HINTON, JR., and Kimberly D. Ingram, Russell Research Center, Athens, GA, USA
- T41 Comparison of Three Commercial Competitive Exclusion Products on Reducing *Salmonella* in Broilers – ANOTONIO JOSE PIANTINO FERREIRA, C. S. A. Ferreira, T. Knobl, A. M. Moreno, M. R. Bacarro, M. Chen, and M. Robach, University of Sao Paulo, Sao Paulo, Brazil
- T42 Effectiveness of Potassium Lactate and Lactic Acid Against *Campylobacter* and Psychrotrophic Bacteria on Chicken Breasts – DAVID RASMUSSEN, S. Sumner, J. Eifert, C. Hackney, and S. Duncan, Virginia Tech., Blacksburg, VA, USA
- T43 Application of Natural Antimicrobial Systems to the Surfaces of Cooked Meat for Control of *L. monocytogenes* – XINTIAN MING, Jeff Lambeseder, Fred Bender, and Bill King, Food Bioprotection, Rhodia Foods, Madison, WI, USA
- T44 Comparative Study of Semisynthetic Derivative of Natamycin and the Parent Antibiotic on the Spoilage of Shredded Cheddar Cheese – ERIC C. SULOFF, J. E. Marcy, C. R. Hackney, and S. S. Sumner, Virginia Polytechnic Institute and State University, Blacksburg, VA, USA
- T45 Co-60 Irradiation for Inactivation of *Giardia lamblia* Cysts in Water and on Tomatoes – CHRISTINE A. SUNDERMANN, B. Estridge, F. Woods, D. Conner, J. Weese, and C. Wei, Auburn University, Auburn University, AL, USA
- T46 Inhibitory Effect of Gamma Irradiation on the Growth of *Fusarium moniliforme* and Fumonisin Production – DEOG-HWAN OH, C. C. Yoo, and B. K. Park, Kangwon National University, Korea

- T47 Resistance of Poliovirus to Inactivation by High Hydrostatic Pressures – NIGEL COOK, N. Wilkinson, A. S. Kurdziel, S. Langton, and E. Needs, Central Science Laboratory, York, UK
- T48 The Effect of Thermal Processing Schedules and Unit Operations on the Quality of Blue Crab (*Callinectes sapidus*) Meat – GEORGE JOSEPH FLICK, Jr., Jennifer L. Smith, Robert Lane, Michael Jahncke, and Robert Croonenberghs, Virginia Tech., Blacksburg, VA, USA
- P4 Microbiological Methods**
(10:00 a.m. – 1:00 p.m.)
- P111 Evaluation of Universal Preenrichment Broth for Growth of Heat-injured Pathogens – TONG ZHAO, and Michael P. Doyle, University of Georgia, Griffin, GA, USA
- P112 Characterization of *Listeria monocytogenes* from Cold Smoked Fish Plant by Pulsed-field Gel Electrophoresis (PFGE) – ANITA METIVIER, Antoine Berthier and Marielle Gay, ASEPT, 53020 LAVAL Cedex 9, France
- P113 *Listeria monocytogenes* Detection in Food Using an ELISA-based Method – PATRICE ARBAULT, Marie-Laure Sorin, Sébastien Faure, and Sandrine Poumerol, Diffchamb SA, 69007, Lyon, France
- P114 Factors Affecting the Isolation and Enumeration of *Escherichia coli* O157:H7 on Alfalfa Seeds – FONE MAO WU, Bala Swaminathan, Joy Wells, Larry Slutsker, Michael P. Doyle, and Larry R. Beuchat, University of Georgia, Griffin, GA, USA
- P115 Efficacy of Various Non-selective Resuscitation Media for Increased Detection of Heat-injured *Escherichia coli* O157:H7 – EDWARD E. FETZER, and Aubrey F. Mendonca, Iowa State University, Ames, IA, USA
- P116 Phosphate Buffer Increases Recovery of *E. coli* O157:H7 from Frozen Apple Juice – SHERYL A. YAMAMOTO, and Linda J. Harris, University of California, Davis, Davis, CA, USA
- P117 Evaluation of FDA/BAM and Rapid Methods for Enumeration and Detection of *E. coli* O157:H7 from Farm Animal Environments – CHRISTOPHER A. KIEFER, D. A. Golden, F. A. Draughon, A. G. Mathew, and S. P. Oliver, University of Tennessee, Knoxville, TN, USA
- P118 Rapid and Sensitive Identification of Viable *Escherichia coli* O157:H7 in Food by Reverse Transcription PCR – SIMA YARON, and Karl R. Matthews, Rutgers University, New Brunswick, NJ, USA
- P119 Comparison of Selective Media for Evaluating Survival of *E. coli* O157:H7 in Fruit Juices – CHARITY A. LAKINS, B. L. Knox, D. A. Golden, and S. S. Sumner, University of Tennessee, Knoxville, TN, USA
- P120 Multiple Target Medium to Screen for *Enterobacteriaceae* and *Escherichia coli* in Meats – R. VICTOR LACHICA, US Army Natick Research, Development & Engineering Center, Natick, MA, USA
- P121 Media Evaluation for Recovery of Injured Cells of *Escherichia coli* O157:H7 and *Salmonella* spp. – ALEJANDRO AMEZQUITA, and Mindy Brashears, University of Nebraska Lincoln, Lincoln, NE, USA
- P122 Comparison of Selective Enrichment Media to Recover *Salmonella* from Acidified Barbecue and Liquid Non-dairy Products – KAMESH ELLAJOSYULA, John Shields, Nadia Melnyk, and Cecelia Marshall, Rich Products Corp., Buffalo, NY, USA
- P123 Evaluation of a Lateral Flow Device for Detecting *Salmonella enteritidis* in Raw Eggs and Chicken Feces – KUN-HO SEO, P. S. Holt, B. W. Mitchell, and R. K. Gast, USDA-ARS, Athens, GA, USA
- P124 Improved Isolation of *Salmonella* from Chocolate – PETER J. STEPHENS, and Elaine E. M. Fraser, Oxoid Ltd., Basingstoke, Hampshire, England, UK
- P125 Recovery of *Salmonella* from Artificially Contaminated Dairy Feeds – YOBOUET DJE, F. A. Draughon, David A. Golden, P. Stephen Oliver, and J. Willie Taylor, University of Tennessee, Knoxville, TN, USA
- P126 Selective and Differential Properties of Chromogenic Media for Isolation of Salmonellae from Foodstuffs – PETER J. STEPHENS, and Tom Sadler, Oxoid Ltd., Basingstoke, Hampshire, England, UK
- P127 Detection of *Campylobacter jejuni* in Dairy Silage – WILLIE JAMES TAYLOR, F. A. Draughon, David Golden, Stephen Oliver, and Michelle Saul, University of Tennessee Knoxville, TN, USA
- P128 A Comparison of Isolation Protocols for Recovery of *Campylobacter jejuni* from Cattle Feces – WILLIE JAMES TAYLOR, F. A. Draughon, David Golden, Stephen Oliver, and Michelle Saul, University of Tennessee Knoxville, TN, USA
- P129 A Rapid Method to Identify and Enumerate Foodborne Pathogens Using Machine Vision – OMAR TRUJILLO, Carl Griffis, Michael Slavik, and Yanbin Li, University of Arkansas, Fayetteville, AR, USA

(Wednesday morning, *continued*)

- P130 Detection of Guaiacol Produced by *Alicyclo-bacillus acidoterrestris* in Apple Juice by Sensory and Chemical Analyses – LARRY R. BEUCHAT, Rachel V. Orr, Robert L. Shewfelt, C. J. Huang, and Sebhat Tefera, University of Georgia, Griffin, GA, USA
- P131 Sampling Technique Efficacy for *Arcobacter butzleri* from Live Chickens – ROBERT MATTHEW CASTLE, J. D. Eifert, F. W. Pierson, C. T. Larsen, and C. R. Hackney, Virginia Tech., Blacksburg, VA, USA
- P132 Detection of Coliforms on Food Contact Surfaces – GINNY MOORE, Chris Griffith, and Adrian Peters, Food Safety Research Group, University of Wales Institute Cardiff (UWIC), Cardiff, UK
- P133 Detection of Zearalenone by Fluorescence Polarization Immunoassay and Its Application to Corn – JUNG-HYUN PARK, Mi-Ja Park, Kwang-Soo Ha, and Duck-Hwa Chung, Gyeongsang National University, Chinju, Gyeongnam, Korea
- P134 Screening of Deoxynivalenol Producing Fungi from Greenhouse Horticulture Soils and Products by ALP/NADP Method – DUCK-HWA CHUNG, Mi-Ja Park, Jung-Hyun Park, and Kwang-Soo Ha, Gyeongsang National University, Chinju, Gyeongnam, Korea
- P135 A Comparison of Methods for Monitoring Food Contact Surface Cleanliness – CRAIG DAVIDSON, Chris Griffith, Adrian Peters, and Louise Fielding, University College of Worcester, Henwick Grove, Worcester, UK
- P136 Spreadsheet Tool for Recording and Evaluating Microbiological Environmental Sampling Data – JOSEPH DANIEL EIFERT, H. Wang, and T. Tu, Virginia Tech., Blacksburg, VA, USA
- P137 Reverse Dot-Blot DNA/DNA Hybridization Method for the Detection of Bacteria Involved in Amine Formation in Albacore Tuna (*Thunnus alalunga*) – JORGE BARROS-VELÁZQUEZ, Begoña Ben-Gigirey, Juan M. Vicites, Shin-Hee Kim, Haejung An, and Tomás G. Villa, University of Santiago de Compostela, Lugo, Lugo, Spain
- P138 The Use of MALDI-TOF and Nanospray-Ion Trap Mass Spectrometry to the Characterization of Specific Proteins Separated by Two-dimensional Electrophoresis: Application of Proteomics to the Control of Species Substitution in Fish Products – JORGE BARROS-VELÁZQUEZ, C. Piñeiro, J. Vázquez, A. Marina, R. I. Pérez-Martín, and J. M. Gallardo, Universidad de Santiago de Compostela, Lugo, Spain

- P139 Detection of *Shigella* Using a Digoxigenin-labeled Polynucleotide DNA Probe – JOSEPH L. FERREIRA, Mark Harrison, and Paul Edmonds, FDA, Southeast Regional Laboratory, Atlanta, GA, USA

WEDNESDAY AFTERNOON – AUGUST 9, 2000

(1:30 p.m. – 5:00 p.m.)

S19 The Role of Norwalk-like Viruses (NLVs) in Foodborne Disease

- The Role of NLVs in Foodborne Disease – STEPHAN S. MONROE, CDC, Atlanta, GA, USA
- Environmental Contamination in a Large Hotel with a Prolonged NLV Outbreak – JOHN D. CHESBROUGH, Public Health Laboratory, PHLS Northwest, Preston, UK
- Detection of NLVs in Foods – DORIS D. D'SOUZA, North Carolina State University, Raleigh, NC, USA
- Genetic Relatedness of NLVs in Foodborne Disease Outbreaks – STEPHAN S. MONROE, CDC, Atlanta, GA, USA
- Dose-Response Relationships of Norwalk Virus from Human Challenge Studies – CHRISTINE MOE, University of North Carolina, Chapel Hill, NC, USA
- Control of NLV Outbreak in a Large Hotel Casino – DANIEL J. MAXSON, Clark Co. Health District, Las Vegas, NV, USA

S20 International Trends in On-Farm Food Safety

- The Australian Experience – PAUL RYAN, AgWest Trade and Development, South Perth, Western Australia
- The Irish Experience – The Clean Green Island – Food Safety Assurance Schemes – THOMAS QUIGLEY, Food Safety Authority of Ireland, Dublin, Ireland
- The Canadian Experience – Canadian On-Farm Food Safety Program – ALBERT CHAMBERS, Canadian On-Farm Safety Program, Monachus Consulting, Ottawa, Ontario, Canada
- The US Experience – To be announced
- The Latin American Experience – To be announced
- Comparison of EU/US/Australian On-Farm QA/ Food Safety Schemes – RICHARD BAINES, Royal Agricultural College, Cirencester, UK
- The Emerging International Standard: On-Farm Food Safety & Codex – To be announced

S21 The Earth is Curved (And so are Kinetic Data)

(Sponsored by IAFP Foundation Fund and Nabisco, Inc.)

- Historical Perspective on Microbial Inactivation Data Analysis: Linear Treatments - What, How, Why (not) – FRANK BUSTA, University of Minnesota, St. Paul, MN, USA
- Non-linear Treatments of Microbial Inactivation Data - What, How, Why – MICHA PELEG, University of Massachusetts, Amherst, MA, USA
- Modeling Thermal Inactivation of *Clostridium botulinum* Spores – PETER MCCLURE, Unilever Research, Sharnbrooke, Bedford, UK
- Modeling the Effect of Relative Humidities on Heat Resistance of *Salmonella* Typhimurium DT104 – KAREN MATTICK, PHLS Food Microbiology Research Unit, Heavitree, Exeter, Devon, UK
- Implications of Non-Linear Inactivation Kinetics for Risk Assessment – MARTIN COLE, Food Safety and Quality, Food Science Australia, North Ryde, Australia

T5 Risk Assessment and Miscellaneous

- T49 Risk Assessment of *Salmonella enteritidis* in Canadian Shell Eggs – GREG M PAOLI, E. C. D. Todd, and W. Ross, Decisionalysis Risk Consultants, Inc., Ottawa, Ontario, Canada
- T50 A Risk Assessment Model for *Salmonella* spp., *Campylobacter jejuni*, and Chicken – THOMAS PATRICK OSCAR, University of Maryland, Princess Anne, MD, USA
- T51 Risk Assessment for Harmful Algal Blooms – Can *Vibrio vulnificus* be a Model for These Agents? – EWEN C. TODD, William Ross, and Mark Smith, Health Protection Branch, Health Canada, Ottawa, Ontario, Canada
- T52 *Cyclospora oocysts* on Raspberries from Guatemala – A Qualitative Risk Assessment – EWEN TODD, Brent Dixon, Helene Couture, Andrea Ellis, Isabelle Laberge, and Rene Cardinal, Food Directorate, Health Canada, Ottawa, Ontario, Canada
- T53 Safety and Quality Evaluation of Thai Fermented Sausage (Nham) – KWANTAWEE VICHIENTROJ PAUKATONG, and S. Kunawasen, National Center for Genetic Engineering and BioTech., Bangkok, Thailand
- T54 The Use of Household Shopping Patterns to Identify Sources of Foodborne Disease – SUSAN POWELL, Richard Attwell, and Michael Painter, Manchester Metropolitan University, Manchester, UK
- T55 Quantification and Variability Analysis of Bacterial Cross-contamination Rates in the Kitchen – YUHUAN CHEN, Fabiola P. Chea, Kristin M. Jackson, and Donald W. Schaffner, Food Risk Analysis Initiative, Rutgers University, New Brunswick, NJ, USA
- T56 The Use of Notational Analysis to Assess Cross Contamination during Domestic Food Preparation – CHRIS GRIFFITH, Craig Davidson, Adrian Peters, and Andrew Lewis, University of Wales Institute, Cardiff, UK
- T57 Contamination of Kitchen Surfaces after Domestic Food Preparation – CHRIS GRIFFITH, Elizabeth Redmond, and Adrian Peters, University of Wales Institute, Cardiff, UK
- T58 The Significance of Hand Drying after Handwashing – BARRY MICHAELS, Vidhya Gangar, Eric Meyers, Heidi Johnson, and Michael S. Curiale, Georgia Pacific Corp., Palatka, FL, USA
- T59 Changes of Aflatoxins during the Ripening and Storage of Korean Soy Sauce and Soybean Paste and the Characteristics of the Changes – JONG-GYU KIM, Woo-Sup Roh, Yong-Wook Lee, and Lloyd B. Bullerman, Keimyung University, Taegu, Korea
- T60 Migration of *Penicillium spinulosum* from Paperboard Packaging to Extended Shelf-life Milk – LAURA SAMMONS, S. S. Sumner, C. R. Hackney, J. Marcy, S. E. Duncan, and W. Eigel, Virginia Tech., Blacksburg, VA, USA

**Program updates available
at our Web site
www.foodprotection.org**



International Association for
Food Protection

ATLANTA

EVENT INFORMATION

Evening Events

Cheese and Wine Reception

Sunday, August 6, 2000 (8:00 p.m. – 10:00 p.m.)

A tradition continues for attendees and guests. The reception begins in the exhibit hall immediately following the Ivan Parkin Lecture on Sunday evening.

Exhibit Hall Reception

Monday, August 7, 2000 (5:00 p.m. – 6:30 p.m.)

Relax with colleagues and friends in the exhibit hall at the end of the day. Exhibitors showcase the latest developments in the industry during this informal reception.

Monday Night Social – Fernbank Museum of Natural History

Monday, August 7, 2000 (6:00 p.m. – 9:30 p.m.)

A world of exciting adventure awaits you at Fernbank Museum of Natural History. At your leisure you will have the opportunity to dine with colleagues and explore unique state-of-the-art galleries and exhibitions. Fernbank uses innovative design and programming to draw natural history out of display cases and bring it to life. For a limited time only, Fernbank is featuring the world renowned collection of Egyptian art from the National Museum of Antiquities in Leiden, The Netherlands. Mummies, sculptures, jewelry and papyrus pages from the Book of the Dead are among the antiquities featured. This is the only time that these pieces will be on view in the United States before they return to The Netherlands for permanent reinstallation. Don't miss this rare opportunity!

Dinner at Stately Oaks

Tuesday, August 8, 2000 (6:30 p.m. – 10:00 p.m.)

Stately Oaks, a Greek Revival plantation home, was built in 1839 and housed Yankee officers during the Battle of Jonesboro. The home is furnished with period pieces and offers a glimpse of life in the Antebellum



August 6-9

Atlanta, Georgia

period. A guide will take you on an informative tour throughout the house, painting a picture of the rural South during the mid 1800s. Guests will then enjoy a delicious Southern cooked meal. You will not go away hungry!

Awards Banquet

Wednesday, August 9, 2000 (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

(Lunch included in all daytime tours)

Pop Topics

Sunday, August 6, 2000 (9:30 a.m. – 2:30 p.m.)

Today's tour will not only quench your thirst for knowledge but will also quench your thirst. Enjoy a tour of CNN and the world of Coca-Cola Museum. Watch as writers, editors, producers and technicians bring round-the-clock news coverage to over 200 countries worldwide. Take your taste buds on a trip around the globe when you sample Coke's most popular products from other countries at the first museum dedicated to the world famous soft drink, Coca-Cola. Your tour will continue to The Varsity, an Atlanta legacy, where you can order the best chili dogs and hamburgers in town. A stop at Underground Atlanta, the most popular visitor attraction in Georgia, will complete your tour.

Daytime Tours *(continued)*

Peach Buzz

Monday, August 7, 2000 (9:30 a.m. – 2:30 p.m.)

Enjoy a driving tour of Atlanta sites and take a glimpse into the lives of Atlanta's historical hometown heroes. Be a part of history at the Carter Presidential Center where you will find exhibits that focus on important twentieth century events. Continue your historical journey to the Martin Luther King, Jr. Historic District on "Sweet Auburn Avenue" and see the MLK Center, Dr. King's birth home and tomb. You will then experience a revival of genuine Southern hospitality and the finest selection of Southern homestyle food in the city at Mary Mac's Tea Room.

Diaries of the South

Tuesday, August 8, 2000 (9:30 a.m. – 2:30 p.m.)

Be swept away to one of the most exclusive areas of Georgia with a driving tour of Buckhead. Today, Buckhead is considered Atlanta's "Little Hollywood". Step back in time at the Atlanta History Center and see how locals lived over 100 years ago. Continue your journey to the elegant Swan House to witness the glitz and glamour of yesteryear. This beautiful home was built around 1920 for Mr. Inman, one of Atlanta's wealthiest citizens. Walk through the Tullie Smith Plantation, an original farmhouse circa 1800s. Personnel dressed in period costume enhance the multi-sensory experience and offer a charming look at turn-of-the-century fashions. The highlight of the day will be the final stop at the Swan Coach House for lunch. The Swan Coach House presents gourmet cuisine, accented with Southern flavors. Encircled by colorful gardens and natural woodlands, this early 20th century carriage house was once part of the Inman estate.

Affiliate Educational Session

Affiliate Educational Session

Saturday, August 5, 2000 (2:00 p.m. – 4:00 p.m.)

Attention Affiliate delegates, gain insights on Affiliate organizational issues. Be a leader for your Affiliate and participate in this educational experience.

New Member Reception and Orientation

New Member Reception

Saturday, August 5, 2000 (4:30 p.m. – 5:30 p.m.)

Is this your first time attending the Annual Meeting? If so, you are invited to attend this orientation session.

Learn how to get involved in Committees and get the most out of attending the Meeting. We look forward to your participation.

Committee Meetings

Committee Meetings

Sunday, August 6, 2000 (7:00 a.m. – 5:00 p.m.)

Share a wealth of knowledge and expertise. Committees and Professional Development Groups (PDGs) plan, develop and institute many of the Association's projects. Technical challenges facing the food safety industry are discussed, examined and debated. Volunteer to serve on any number of committees or PDGs that plan and implement activities to meet the Association's mission. Everyone is welcome.

Student Luncheon

Student Luncheon

Sunday, August 6, 2000 (12:00 p.m. – 1:30 p.m.)

Take charge of your career today! A Student Professional Development Group (PDG) has formed to provide students the opportunity to network with peers and serve as a point for food safety employers to seek qualified applicants. Sign up for the luncheon today to get involved. The purpose of the luncheon is to establish objectives and responsibilities as a PDG and discuss plans for the future. Dr. Anna Lammerding, Chief of Microbial Food Safety Risk Assessment from Health Canada and Mr. Gale Prince, Director of Regulatory Compliance at The Kroger Co. will speak about challenges and opportunities in the field of food safety.

Golf Tournament

The Golf Club at Bradshaw Farm

Sunday, August 6, 2000 (6:00 a.m. – 2:00 p.m.)

Enjoy spectacular views of the northern Georgia mountains as you join your friends and colleagues in a round of golf at The Golf Club at Bradshaw Farm. Everyone is invited to participate in this best-ball tournament. Built on historic farm property, the unique barn-style club house is reminiscent of the great history attached to the course. With elevated tees, tree-lined bermuda fairways and meticulously groomed bentgrass greens, Bradshaw Farm remains one of the most highly regarded layouts in the Atlanta metro area and is perfect for golfers of all skill levels. What an ideal way to kick off the 87th Annual Meeting!



International Association for Food Protection

87th 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

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
- Awards Banquet
- 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 June 30, 2000. After June 30, late registration fees are in effect. Registration materials may be picked up on site at the Hilton Atlanta.

Refund/Cancellation Policy

Registration fees, less a \$50 administration fee and any applicable bank charges, will be refunded for written cancellations received by July 14, 2000. No refunds will be made after July 14; however, the registration may be transferred to a colleague with written notification. Refunds will be processed after August 14, 2000. Additional tickets purchased are nonrefundable.

Exhibit Hours

Sunday, August 6, 2000 — 8:00 p.m. – 10:00 p.m.
Monday, August 7, 2000 — 9:30 a.m. – 1:30 p.m.
3:00 p.m. – 6:30 p.m.
Tuesday, August 8, 2000 — 9:30 a.m. – 1:30 p.m.

August 6-9, 2000, Atlanta, Georgia

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 \$119 per night, single or double. Make your reservations as soon as possible; this special rate is available only until July 7, 2000.

Hilton Atlanta
255 Courtland Street, NE
Atlanta, Georgia 30303
404.659.2000

Evening Events

Sunday, August 6, 2000

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

Monday, August 7, 2000

Exhibit Hall Reception (5:00 p.m. – 6:30 p.m.)

Monday Night Social **Fernbank Museum of Natural History**
(6:00 p.m. – 9:30 p.m.)

Tuesday, August 8, 2000

Dinner at Stately Oaks (6:30 p.m. – 10:00 p.m.)

Wednesday, August 9, 2000

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

Daytime Tours

(Lunch included in all daytime tours)

Sunday, August 6, 2000

Pop Topics (9:30 a.m. – 2:30 p.m.)

Monday, August 7, 2000

Peach Buzz (9:30 a.m. – 2:30 p.m.)

Tuesday, August 8, 2000

Diaries of the South (9:30 a.m. – 2:30 p.m.)

Golf Tournament

Sunday, August 6, 2000

Golf Tournament (6:00 a.m. – 2:00 p.m.)



International Association for Food Protection

87th Annual Meeting

6200 Aurora Avenue, Suite 200W
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 Fax: 515.276.8655
 E-mail: info@foodprotection.org
 Web site: www.foodprotection.org

Attendee Registration Form

August 6-9, 2000, Atlanta, Georgia



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

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.

Member Number: _____

REGISTER BY JUNE 30, 2000 TO AVOID LATE REGISTRATION FEES

REGISTRATION FEES:

Registration (Awards Banquet included) _____
 Association Student Member* _____
 Retired Association Member* _____
 One Day Registration: Mon. Tues. Wed. _____
 Spouse/Companion* (Name): _____
 Children 15 & Over* (Names): _____
 Children 14 & Under* (Names): _____
 *Awards Banquet not included

MEMBERS	NONMEMBERS	TOTAL
\$ 260 (\$310 late)	\$395 (\$445 late)	_____
\$ 45 (\$ 55 late)	Not Available	_____
\$ 45 (\$ 55 late)	Not Available	_____
\$ 145 (\$170 late)	\$200 (\$225 late)	_____
\$ 40 (\$ 40 late)	\$ 40 (\$ 40 late)	_____
\$ 25 (\$ 25 late)	\$ 25 (\$ 25 late)	_____
FREE	FREE	_____

EVENTS:

Golf Tournament (Sunday, 8/6) _____
 Student Luncheon (Sunday, 8/6) _____
 Monday Night Social, Fernbank Museum (Monday, 8/7)
 Children 14 and under _____
 Dinner at Stately Oaks (Tuesday, 8/8)
 (Limited tickets available) _____
 Awards Banquet (Wednesday, 8/9) _____

	# OF TICKETS	
\$ 90 (\$105 late)	_____	_____
\$ 5 (\$ 10 late)	_____	_____
\$ 39 (\$ 44 late)	_____	_____
\$ 34 (\$ 39 late)	_____	_____
\$ 60 (\$ 65 late)	_____	_____
\$ 40 (\$ 45 late)	_____	_____

DAYTIME TOURS:

(Lunch included in all daytime tours)
 Pop Topics (Sunday, 8/6) _____
 Peach Buzz (Monday, 8/7) _____
 Diaries of the South (Tuesday, 8/8) _____

\$ 56 (\$ 61 late)	_____	_____
\$ 53 (\$ 58 late)	_____	_____
\$ 65 (\$ 70 late)	_____	_____

TOTAL AMOUNT ENCLOSED \$ _____
 US FUNDS on US BANK

Payment Options:

Check Enclosed

JOIN TODAY AND SAVE!!!
 (Attach a completed Membership application)
 (See page 403 of this issue
 for a membership application)

Name on Card _____

Signature _____

Expiration Date _____

EXHIBITORS DO NOT USE THIS FORM



Annual Meeting Workshops

Sponsored by



International Association for
Food Protection

Atlanta Hilton
Atlanta, Georgia
Saturday, August 5, 2000

Workshop I — Microbiological Sampling Plans and Sample Collection for Food Processors

This hands-on workshop is intended for food processor personnel who have responsibility for microbiological sampling plans, sample analysis, data interpretation, and sample collection.

WORKSHOP TOPICS

Module A: Sample Collection Protocols and Recordkeeping

Module B: Sampling Plans for Foodborne Pathogens and HACCP Programs

Module C: Sampling Plans for Food Processing Environments

Module D: Investigational (biased) and Attribute (random) Sampling

Module E: Sampling Plans for Storage or Shelf-life Studies

INSTRUCTORS

Joseph D. Eifert, Ph.D., Department of Food Science & Technology, Virginia Tech, Blacksburg, VA

W. Payton Pruett, Ph.D., Silliker Laboratories Group, Inc., Homewood, IL

Gary M. Smith, Silliker Laboratories Group, Inc., Homewood, IL

WHAT PARTICIPANTS WILL LEARN

Participants will learn proper techniques for sample collection, sample handling, designing appropriate sampling plans for their products and processes. Also, how to evaluate microbiological sample analysis data and adjust their sampling plans. This workshop emphasizes microbiological sampling, rather than analytical testing.

WHO SHOULD ATTEND?

Quality Assurance and Quality Control personnel; Laboratory personnel from food processing industry and private testing laboratories; and Food Technologists and Research and Development personnel.

HOURS FOR WORKSHOP

Saturday, August 5, 2000

Registration — 8:00 a.m. Continental Breakfast

Workshop — 8:30 a.m. — 4:30 p.m.

Lunch — Provided

Workshop II — Using Information Technology to Manage Food Safety Risks

This workshop promises to be a thought provoking, timely, and multi-disciplinary look at how Information Technology (IT) is being used in the field of food safety.

WORKSHOP TOPICS

From EpiInfo to FoodNet: Improving Surveillance and Outbreak Response

Automating Audits and Inspections with Mobile Computing Solutions

eHACCP: Temperature Data Acquisition and Electronic Data Management

Improving Lab Information Management for Better Decision-Making

Clean Behind the Ears: Using Handheld Technology for Audits and HACCP Verification

INSTRUCTORS

Arthur Liang, Ph.D., Centers for Disease Control and Prevention (CDC), Atlanta, GA

John E. Griggs, Ph.D., GSC Mobile Solutions, East Lansing, MI

Dick Ohaus, Tangent Systems, Inc., Charlotte, NC

Karen Mullery, 3M Microbiology Products, St. Paul, MN

Frank Yiannas, Walt Disney World, Co., Lake Buena Vista, FL

WHAT PARTICIPANTS WILL LEARN

Come learn from industry and regulatory leaders the historical perspectives on information management for food safety solutions; the current uses of IT ranging from foodborne disease surveillance, laboratory data management, food safety audits, HACCP and more; available software and hardware options for your unique needs; see real world examples of food safety IT applications; and perform hands-on exercises using state-of-the-art products.

WHO SHOULD ATTEND?

Food safety professionals, regulatory officials or information technology professionals involved with food processing and retail inspections, HACCP, or risk management decisions utilizing laboratory data.

HOURS FOR WORKSHOP

Saturday, August 5, 2000

Registration — 8:00 a.m. Continental Breakfast

Workshop — 8:30 a.m. — 4:30 p.m.

Lunch — Provided

For additional information visit our Web site at www.foodprotection.org

Annual Meeting Workshops

◆ Registration Form ◆



Hilton Atlanta ◆ Atlanta, Georgia
Saturday, August 5, 2000

- WORKSHOP I: Microbiological Sampling Plans and Sample Collection for Food Processors
- WORKSHOP II: Using Information Technology to Manage Food Safety Risks

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 \$ _____ Signature _____
(US Funds on US Bank)

Expiration date _____

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

Register by July 7th to avoid late registration fees

◆ Registration ◆

WORKSHOP I: Microbiological Sampling Plans and Sample Collection for Food Processors			WORKSHOP II: Using Information Technology to Manage Food Safety Risks		
	Early Rate	Late Rate		Early Rate	Late Rate
IAFP Member	\$280.00	\$355.00	IAFP Member	\$290.00	\$365.00
NonMember	\$380.00	\$455.00	NonMember	\$390.00	\$465.00

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

Refund/Cancellation Policy
Registration fees, less a \$50 administrative charge, will be refunded for written cancellations received by July 21, 2000. 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 14, 2000. The workshop may be cancelled if sufficient enrollment is not received by July 7, 2000.

Exhibitors

of the IAFP 87th Annual Meeting

Companies scheduled to exhibit as of March 31, 2000

 3-A Sanitary Standards Symbol Council Phone: 319.286.9221	Fax: 319.286.9290	 DSM Food Specialities Phone: 414.255.7955	Fax: 414.255.7732
 3M Microbiology Products Phone: 651.733.0942	Fax: 651.737.7678	 Dynal, Inc. Phone: 800.638.9416 x245	Fax: 516.326.3298
AATI Phone: 515.296.6600	Fax: 515.296.6789	Elsevier Science Phone: 212.633.3758	Fax: 212.633.3112
 ABC Research Corporation Phone: 352.372.0436	Fax: 352.378.6483	EM Science Phone: 856.423.6300 x430	Fax: 856.423.4389
American Proficiency Institute Phone: 800.333.0958	Fax: 231.941.7287	Food Processors Institute Phone: 202.393.0890	Fax: 202.639.5941
AOAC International Phone: 301.924.7077	Fax: 301.924.7089	Food Quality Magazine Phone: 215.860.7800	Fax: 215.860.7900
Applied Research Institute Phone: 203.270.7692	Fax: 203.426.3299	Food Safety Net Services, Ltd. Phone: 210.308.0675	Fax: 210.308.8730
Aquionics, Inc. Phone: 606.341.0710	Fax: 606.341.0350	Food Testing & Analysis Magazine Phone: 818.842.4777	Fax: 818.769.2939
 ASI Food Safety Consultants, Inc. Phone: 800.477.0778	Fax: 314.727.2563	 Foss North America Phone: 612.974.9892	Fax: 612.974.9823
 Audits International Phone: 847.433.0900	Fax: 847.433.7873	 GENE-TRAK Systems Phone: 508.435.7402	Fax: 508.435.0025
 BD Biosciences Phone: 410.316.4000	Fax: 410.316.4906	 Glo Germ Company Phone: 435.259.5931	Fax: 435.259.5930
 BioControl Systems, Inc. Phone: 425.603.1123	Fax: 425.603.0080	 IDEXX Laboratories, Inc. Phone: 207.856.0300	Fax: 207.856.0865
 bioMérieux, Inc. Phone: 800.634.7656	Fax: 800.657.3053	IGEN International, Inc. Phone: 301.869.9800 x2127	
BioPath, Inc. Phone: 561.655.2302	Fax: 561.655.3361	 International Association for Food Protection Phone: 515.276.3344	Fax: 515.276.8655
BioSys, Inc. Phone: 800.458.5101	Fax: 613.271.1148	 International BioProducts, Inc. Phone: 425.398.7993	Fax: 425.398.7973
 Capitol Vial, Inc. Phone: 800.772.8871	Fax: 518.853.3409	International Fresh-Cut Produce Association (IFPA) Phone: 703.299.6282	Fax: 703.299.6288
 Celsis, Inc Phone: 800.222.8260 x297	Fax: 847.467.6602	International Food Hygiene Phone: 44 0.1377.241724	Fax: 44 0.1377.253640
 Cogent Technologies, Ltd. Phone: 513.469.6800	Fax: 513.469.6811	 FoodHandler Phone: 800.338.4433	Fax: 800.338.5486
 Decagon Devices, Inc. Phone: 509.332.2756	Fax: 509.332.5158	 JJ Keller & Associates, Inc. Phone: 920.727.7318	Fax: 920.727.7526
 DQCI Services, Inc. Phone: 612.785.0484	Fax: 612.785.0584	 LABPLAS Phone: 450.649.7343	Fax: 450.649.3113

 **Medallion Laboratories**
Phone: 612.764.4453 Fax: 612.764.4010

Microbiology International
Phone: 301.662.6835 Fax: 301.662.8096

Molecular Circuitry, Inc.
Phone: 610.313.9900 Fax: 610.313.9604

 **NASCO International**
Phone: 920.563.2446 Fax: 920.563.8296

 **The National Food Laboratory, Inc.**
Phone: 925.828.1440 Fax: 925.833.8795

 **Nelson-Jameson, Inc.**
Phone: 715.387.1151 Fax: 715.387.8746

 **Neogen Corporation**
Phone: 517.372.9200 Fax: 517.372.0108

ONLINE Engineering, Inc.
Phone: 812.339.9511 Fax: 812.339.9512

 **Organon Teknika**
Phone: 919.620.2377 Fax: 919.620.2615

 **Orkin Pest Control**
Phone: 404.888.2000 Fax: 404.888.2012

 **Oxoid, Inc.**
Phone: 800.567.8378 Fax: 613.226.3728

 **PestWest Electronics, Ltd.**
Phone: 44.19242.77631 Fax: 44.19242.74385

Q Laboratories, Inc.
Phone: 513.471.1300 Fax: 513.471.5600

 **Qualicon, Inc.**
Phone: 302.695.2356 Fax: 302.695.8603

 **REMEL, Inc.**
Phone: 800.255.6730 Fax: 800.447.5750

 **R-TECH Laboratories**
Phone: 651.481.2668 Fax: 651.481.2002

 **Rochester Midland Corporation**
Phone: 716.336.2200 Fax: 716.336.2357

 **Silliker Laboratories Group, Inc.**
Phone: 708.957.7878 Fax: 708.957.1843

VWR Scientific Products
Phone: 610.429.5577 Fax: 610.436.1761

 **Warren Analytical Laboratory**
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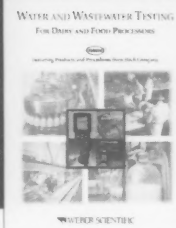
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At the same time, government regulatory agencies need to keep pace with new scientific research and technology, so that regulations are based on sound scientific principals. This is especially important as FDA has shifted its priorities to place increasing focus on food safety. The President continues to emphasize his Food Safety Initiative, which has resulted in increased funding of research, as well as increased product safety surveillance of the food industry.

FDA has made progress in exploring HACCP as a regulatory tool for food safety and in applying scientific principals of risk assessment to evaluate potential food safety issues.

Meanwhile, the scientific community continues to make important strides in understanding pathogens and the degree of risk that certain pathogens present, and in developing new technologies to test for and eliminate risk.

The dairy industry works closely with universities and research centers to support basic and applied research. These efforts are geared toward improving the safety of milk and milk products.

DAIRY PROCESSOR SUPPORT FOR HACCP

The dairy industry fully supports moving toward science-based hazard analysis in the form of a HACCP program.

The industry does not support mandatory HACCP regulations for dairy products. This is primarily because mandatory regulations could be counterproductive and even ineffective. The key principle of a sound HACCP program is that it be specific to an individual manufacturing process — not mandated through a set of predetermined check points. With an effective voluntary HACCP program, dairy processors can properly identify the potential hazards and critical

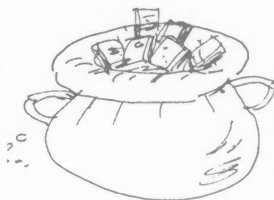
control points in their own processes. An operation's HACCP plan must also allow for flexible revision when changes occur or when new monitoring tools become available.

The dairy industry supports the voluntary adoption of HACCP as a valuable food safety tool, and in fact has been aggressively working to implement HACCP programs throughout US dairy plants. The cheese industry helped move the HACCP concept forward in the past few years by voluntarily participating in an FDA HACCP Pilot Plant program. This program provided industry and agency personnel with information on how to use the HACCP program as a science-based food safety tool.

For Grade A plants (packaged milk, cultured products, etc.), the industry has been working with the National Conference on Interstate Milk Shipments (NCIMS) in implementing a HACCP pilot program. Six dairy plants are currently operating under this HACCP pilot. The industry hopes that the NCIMS will adopt HACCP as a voluntary program in May of this year.

As the leading dairy processor trade association, the International Dairy Foods Association (IDFA) in 1995 developed model HACCP plans for implementation in dairy processing operations. The "Dairy Product Safety System" was developed with the input of scientific and quality managers, and state and federal regulatory agencies, for the ice cream, milk and cheese industries. These plans incorporate the basic HACCP principles in a model for dairy products. The plan can be used as a template for a dairy company to develop its own, customized HACCP plan.

IDFA is currently revising its HACCP manuals in conjunction with the pilot projects described above. In the next year, we expect to increase training programs, particularly geared toward helping dairy plants write and implement HACCP plans for their specific operations.



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Coming Events

JUNE

• **1-2, Quality Systems for Food Processors**, Lake Tahoe, NV. This two-day short course is designed to assist quality assurance and control professionals in the development, implementation, and maintenance of effective, regulatory compliant food safety programs. For further information, contact Silliker Laboratories Group, Inc., at 800.829.7879; Web site: www.Silliker.com.

• **5-7, Texas Assn. of Milk, Food & Environmental Sanitarians**, Holiday Inn South, Austin, TX. For further information, contact Ron Richter at 409.845.4409.

• **7-8, Associated Illinois Milk, Food & Environmental Sanitarians Field Representative Meeting**. For further information, contact Tom Gruetzmacher at 815.395.8797.

• **7-8, Quality Assurance III: ASQ Quality Manager (Part 1), Symposium**, Guelph, Ontario, Canada. For additional information, contact GFTC, 88 McGilvray St., Guelph, Ontario, N1G 2W1, Canada, phone: 519.821.1246; or fax: 519.836.1281.

• **10-14, IFT's Annual Meeting and Food Expo**, Dallas, TX. For additional information, contact Angela Dansby at 312.782.8424 ext. 227; fax: 312.782.8348; E-mail: aldansby@ift.org.

• **15-18, NEHA's 2000 Annual Educational Conference and Exhibition**, Adams Mark Hotel, Denver, CO. For additional information, phone 303.756.9090.

• **21, A Food Safety Workshop for Manufacturers of Ready-to-Eat Products**, Madison, WI. Practical Guidelines for Minimizing Risk of Product Contamination with *Listeria monocytogenes*. This one-day workshop will cover microbiological considerations for control in the

food plant environment, possible "hot spots" in the plant environment, monitoring for *Listeria* and indicator organisms, sanitation, application of PCR technology in the food industry, and auditing food safety practices. Special features include presentations by Kraft Foods, Inc.—*Project Forward Initiative*. Sponsored by Wisconsin Association of Milk and Food Sanitarians. For registration forms and additional information, contact Neil Vassau at 608.833.6181 or nevassau@aol.com.

• **21-22, Heart of America Dairy Management Conference**, Manhattan, KS. This conference is structured to provide dairy producers and industry professionals with one day of in-depth instruction, followed by one day of touring farms with educational stations located on the dairies. For more information, contact Heart of America Dairy Management Conference, PMB 348, 1228 Westloop, Manhattan, KS, 66502-2840; phone: 785.532.2370; fax: 785.532.2333.

• **27-28, Microbiological Concerns in Food Plant Sanitation and Hygiene**, Chicago, IL. This course is designed for individuals responsible for implementing and monitoring sanitation programs. For further information, contact Silliker Laboratories Group, Inc., at 800.829.7879; Web site: www.Silliker.com.

JULY

• **6-14, XXth Gala International Symposium/Workshop on Rapid Methods and Automation in Microbiology**, Kansas State University, Manhattan, KS. For further information, contact Daniel Y. C. Fung at phone: 785.532.5654; fax: 785.532.5681; E-mail: dfung@oz.oznet.ksu.edu; Web site: www.dec.ksu.edu/dec/con/microbiology.

• **16-19, 37th Annual Florida Pesticide Residue Workshop**,

TradeWinds Resort, St. Pete Beach, FL. For additional information, contact Pat Beckett, Florida Dept. of Agriculture, phone: 850.488.9670; fax: 850.922.9110; E-mail: flprw@doacs.state.fl.us.

• **17-21, Laboratory Methods in Food Microbiology**, Silliker Corporate Research Center, South Holland, IL. For more information, contact Silliker Laboratories Group, Inc. at 800.829.7879; Web site: www.Silliker.com.

• **19-21, 3rd Annual Florida Foodborne Pathogen Analysis Conference**, TradeWinds Resort, St. Pete, Beach, FL. Keynote speaker: Dr. Michael Doyle, Professor of Food Microbiology, University of Georgia. For further information, contact Dr. Peggy Melton, Florida Dept. of Agriculture, phone: 850.414.0408; fax: 850.487.6573; E-mail: flpac@doacs.state.fl.us.

• **23-27, The Society for Industrial Microbiology Annual Meeting and Exhibition**, Town & Country Hotel, San Diego, CA. For further information, contact SIM, 3929 Old Lee Highway, Suite 92A, Fairfax, VA; phone: 703.691.3357; fax: 703.691.7991; E-mail: info@simhq.org; Web site: www.simhq.org.

AUGUST

• **5, International Association for Food Protection Annual Meeting Workshops**, Atlanta, GA. Workshop I "Microbiological Sampling Plans and Sample Collection for Food Processors." Workshop II "Using Information Technology to Manage Food Safety Risks." Additional workshop information available in this issue of *DFES* on page 392 or, phone: 800.369.6337; 515.276.3344; fax: 515.276.8655; E-mail: info@foodprotection.org or visit our Web site at www.foodprotection.org for the most current Annual Meeting information.

• **6-9, International Association for Food Protection Annual Meeting**, Atlanta, GA. Registration information available in this issue of *DFES* on page 393 or contact Julie Cattanaach at 800.369.6337; 515.276.3344; fax: 515.276.8655; E-mail: jcattanaach@foodprotection.org. Visit our Web site at www.foodprotection.org for the most current Annual Meeting information.

• **15-16, Quality Systems for Food Processors**, New Orleans, LA. This course is designed to assist assurance and control professionals in the development, implementation, and maintenance of effective, regulatory compliant food safety programs. For further information, contact Silliker Laboratories Group, Inc., at 800.829.7879; Web site: www.Silliker.com.

SEPTEMBER

• **12-16, The National Society for Healthcare Foodservice Man-**

agement 2000 Conference, at the Registry Resort, Naples, FL. For further information, contact Sheila Crowley at 202.546.7236; fax: 202.547.6348.

• **14-15, Microbiological Concerns in Food Plant Sanitation and Hygiene**, Huntington Beach, CA. This course is designed for individuals responsible for implementing and monitoring sanitation programs. For further information, contact Silliker Laboratories Group, Inc., at 800.829.7879; Web site: www.Silliker.com.

• **27-28, Wisconsin Milk & Food Sanitarians Association Annual Meeting**, Regency Suites, Green Bay, WI. For further information, contact Randy Daggs at 608.266.9376.

• **29-Oct. 2, 2nd Biennial 5 A Day International Symposium**, Washington Monarch Hotel, Washington, D.C. Sponsored by U.S. 5 A Day for Better Health Foundation.

Public health professionals and produce industry leaders interested in implementing or strengthening community-based public/private partnerships to improve health in their own countries should attend this conference. For more information, contact National Cancer Institute at 301.496.8520; E-mail: Margaret_Farrell@nih.gov; or Produce for Better Health Foundation at 302.235.2329, ext. 32; E-mail: mneilan@5aday.com.

OCTOBER

• **11-13, Second NSF International Conference on Food Safety: Preventing Foodborne Illness through Science and Education**. The conference will be held in Savannah, GA at the Hyatt Regency. Co-sponsored by IAFP and other organizations. For additional information, contact Wendy Raeder at 734.827.6888; fax: 734.827.7114/6831; E-mail: raeder@nsf.org.



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THOUGHTS on Today's Food Safety...

In the Dairy Industry

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When it comes to food safety, the dairy industry is one of the pioneers and, subsequently, one of the model industries in the US food industry. Government regulation at the local and federal levels has been part of these efforts for almost a century and certainly the relationship between government and the dairy industry is as strong if not stronger than ever on issues of food safety. There is not always consensus between government and industry on how to ensure food safety, but the relationship has nonetheless long been intertwined for dairy foods.

Moving into the next decade, the goals of the dairy industry are to continually improve processing and packaging techniques to eliminate as much as possible the risk of milk-borne pathogens. Government will continue to play a role in this effort, but the dairy industry is also putting into place extensive Hazard Analysis Critical Control Point (HACCP) systems and other food safety measures.

Part of the challenge is that the world of food safety is constantly changing in terms of technology, research and prevention. The dairy industry continues to work with a number of partners to continue as leaders in this critical area.

DAIRY PRODUCT SAFETY HISTORY

Dairy's role as one of the first to set up extensive sanitation and product safety measures in the United States is not surprising. This is because milk has played a central role in US public health throughout our history. No food surpasses milk as a single source of the essential nutrients for maintaining proper health, especially in children and the elderly. In fact, the complex dairy programs of the 1930s were specifically devised to ensure that every child in the country could acquire a daily supply of milk.

This relationship remains strong today, as many public health organizations are concerned about the lack of calcium intake among many Americans. As the US Department of Agriculture reports, 73% of the available calcium in the American diet comes from

dairy foods. So while calcium is available from other sources, dairy products have long been held up as the "gold standard" for calcium intake.

Milk was also tagged as the perfect carrier for vitamin D in the 1930s as a means of eliminating this vitamin deficiency in Americans. As it happens, this vitamin D also greatly aids in the absorption of milk's calcium into the bones.

While milk is a nutritional powerhouse, it also is a raw food that can serve as a vehicle for disease. While the first compulsory milk pasteurization law was passed in Chicago in 1908, it took some time for this revolutionary and at first controversial technology to become ubiquitous. In 1938, milk-borne outbreaks constituted 25% of all disease outbreaks from contaminated foods and water. With the aid of more widespread pasteurization and other technological improvements, that number declined dramatically, and continued to decline in the past decade. Recent information links milk products to fewer than 1% of such outbreaks. Over the past 20 years, virtually all pathogen outbreaks linked to dairy products have concerned post-pasteurization contamination of the product and lack of good manufacturing practices, or total lack of pasteurization in a product that was sold from a questionable vendor such as a street vendor selling homemade cheese.

Almost as significant as pasteurization was the evolution toward entirely closed and sterile systems within a dairy plant to prevent recontamination of milk after pasteurization, and to ensure longer shelf life of dairy products. Dairy companies continue to invest in more sophisticated processing and packaging systems that greatly diminish the risk of pathogens in finished product.

Dairy manufacturers have been vigilant in implementing sanitary measures based on scientific analysis of the manufacturing process. The pasteurization process is a critical control point for product safety and shelf-life of a perishable product such as milk. In addition, strict adherence to good manufacturing practices, and sanitation procedures are necessary to assure that no post-pasteurization contamination occurs during processing and packaging operations.

PARTNERS IN FOOD SAFETY

Dairy products are federally regulated by the Food and Drug Administration (FDA). Dairy processors recognize that a strong, effective federal agency is necessary to give the public confidence in a safe food supply.

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MARK OF COMPLIANCE



The 3-A Symbol Story

The 3-A Sanitary Standards Symbol Administrative Council, known throughout the industry as the "**3-A Symbol Council**," was organized in 1956. Its purpose is to grant authorization to use the **3-A Symbol** on equipment that meets 3-A Sanitary Standards for design and fabrication.

Processors (DIC)



Sanitarians
(IAFP)

Equipment Mfrs.
(IAFIS)

A Modern Concept

The modern concept of the 3-A program was established in 1944 when the Dairy Industry Committee (DIC) was formed. DIC is one of the three industry segments involved in the preparation of 3-A Sanitary Standards. These industry segments are:

- **Processors**, represented by DIC
- **Equipment Manufacturers**, represented by IAFIS
- **Sanitarians**, represented by IAFP

Use of the Symbol

Voluntary use of the **3-A Symbol** on dairy equipment:

- assures processors that equipment meets sanitary standards
- provides accepted criteria to equipment manufacturers for sanitary design & fabrication
- establishes guidelines for uniform evaluation and compliance by sanitarians.

3-A Sanitary Standards Symbol Administrative Council

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