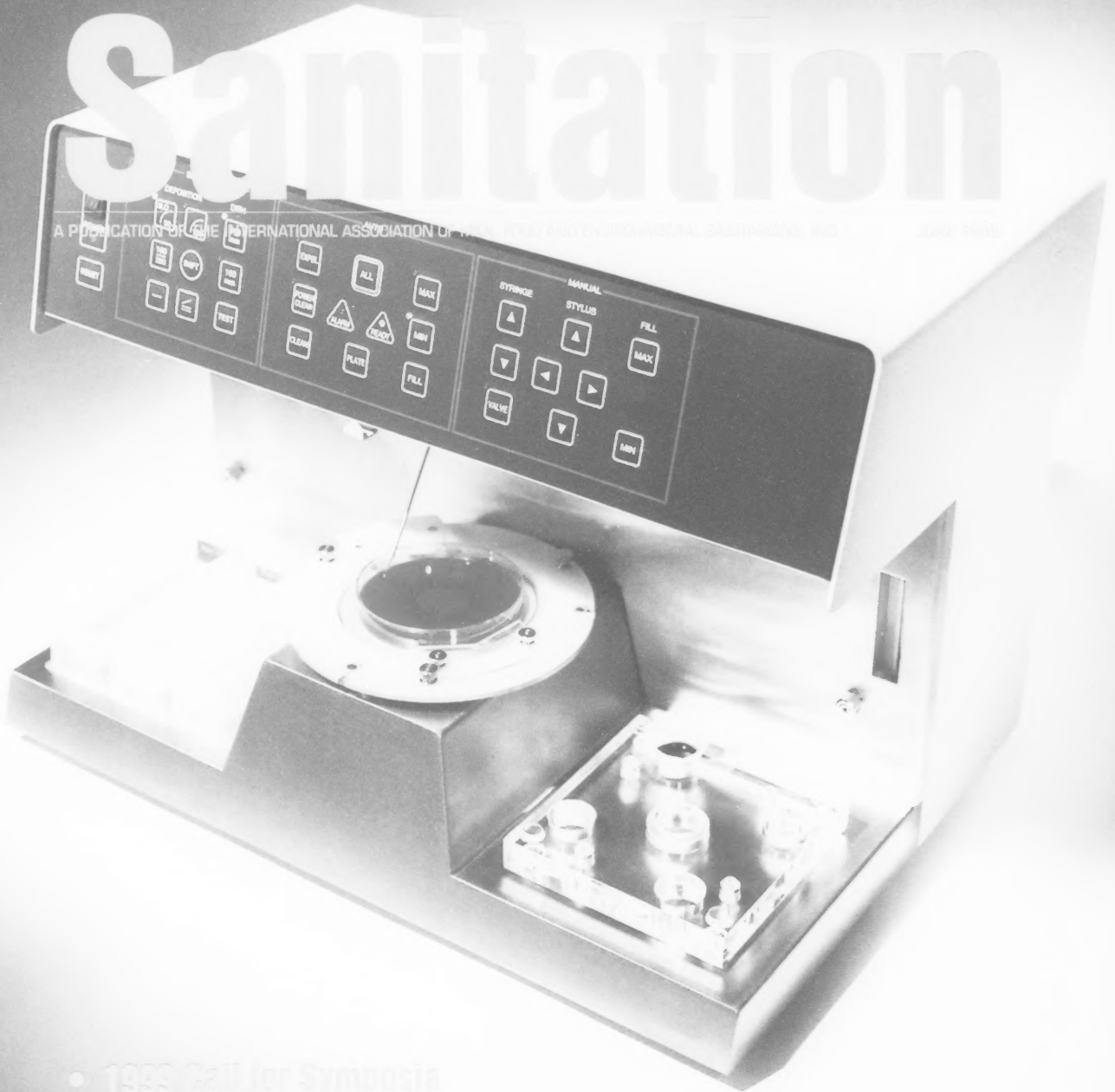


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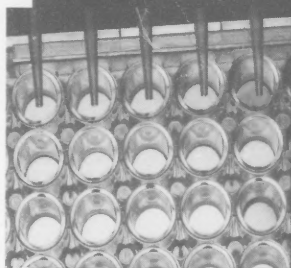
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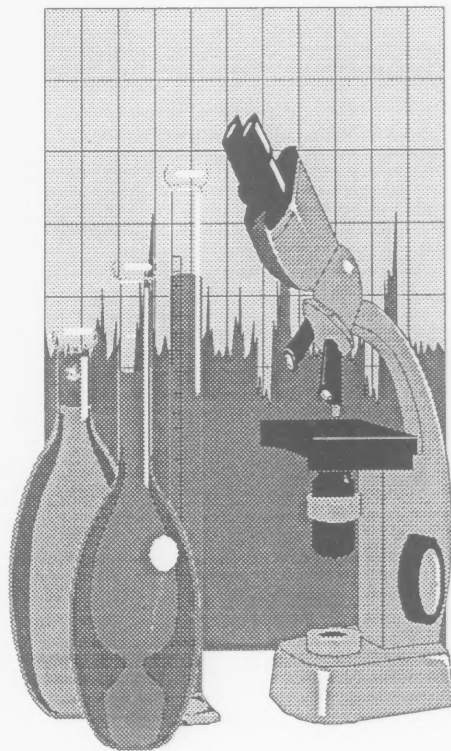
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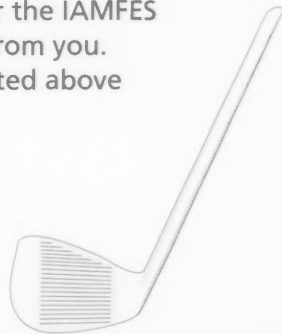
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VIEWS

FROM YOUR PRESIDENT



By ROBERT E. BRACKETT
IAMFES President

“Send us your Best”

This past month I've had the opportunity to perform one of the more pleasant duties as President of IAMFES. That is, to send out congratulatory letters to this year's IAMFES award winners. I really enjoy seeing deserving individuals who often go unnoticed receive recognition. In fact, I know from personal experience that IAMFES is filled with such individuals. The same can be said for IAMFES affiliates. Unfortunately, their fellow IAMFES Members never get to hear about their accomplishments or service because they are not nominated for any awards. It is for this reason that I would like to strongly encourage all IAMFES Members to consider nominating worthy IAMFES Members for our awards.

In many organizations, one of the biggest challenges with which awards committees contend is narrowing the field of nominees to the top two or three candidates. I'm sorry to report that IAMFES does not have this problem. In fact, we have the opposite problem. In the case of IAMFES awards, the number of submissions is often disappointingly small. In some cases, the awards committees have actually had to actively solicit submissions because so few voluntary submissions were received. The question is often raised, why are our Members so reluctant to submit their friends and colleagues for IAMFES awards? Here are some of the reasons I've heard:

• *Everybody's business is nobody's business.* This is a major reason why IAMFES Members

don't submit the names of colleagues for awards, particularly in the case of the MOST obvious potential nominees. It is assumed that since the person is so obviously deserving, that someone (else) will be sure to nominate the person. Result? Nobody ends up nominating the person. The message here is clear. If you know of a deserving person, make yourself a committee of one and nominate the person. We'd rather have multiple nominations for worthy individuals than none.

• *The nomination process is too complicated.* Some Members are concerned that perhaps the applications process may be difficult, time consuming or complicated. In fact, nominating someone is often as simple as writing a letter of nomination and sending information about the nominee. In addition, the IAMFES office can provide you with the type of information needed as well as awards criteria.

• *I can't think of anybody to submit.* Of all the reasons not to submit someone, this is the easiest to remedy. To find someone to submit, simply open your eyes at work, your local affiliate meeting, or at the IAMFES Annual Meeting. Virtually every IAMFES Member is eligible for some award. We have awards for students, educators, activity within IAMFES, public service, corporate excellence in food safety, and distinctive work as a sanitarian. Committees and Professional Development Groups are especially fertile grounds for identifying worthy nominees. All it takes is the willingness to identify these people.

• *We have no chance of winning.* A quick look at the award winners for the affiliate awards (C. B. Shogren and Membership Achievement Awards) shows that the same affiliates seem to repeatedly win these awards. Many affiliate members believe this happens because the winning affiliates are the largest or richest. They believe that only such affiliates have a chance of winning and that small or newer affiliates are simply not competitive. Not true!! In fact, the main reason the same affiliates win repeatedly is that they are the ones that consis-

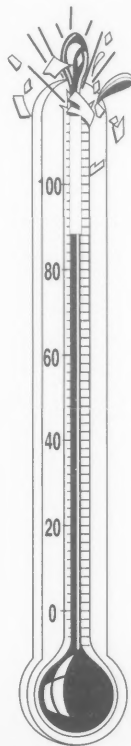
tently apply! Winning the C. B. Shogren Award has more to do with an enthusiastic spirit of the affiliate and a thoughtfully written dossier, and much less to do with size. Moreover, even the tiniest affiliate can win a Membership Achievement Award if they simply submit their annual report.

• *I just didn't think of it.* I must admit, I've been guilty of this excuse. We are all so busy with our jobs and families these days that we just simply forget about the awards until the deadline is upon us, or even passed. IAMFES typically publishes the initial

request for award submissions in the fall issues of *Dairy, Food and Environmental Sanitation*. The typical well-intentioned response might be to think of someone to nominate at the time of these notices, but then forget as time passes.

The various IAMFES awards were created to both foster and reward excellence. The more nominees submitted, the keener the competition and higher the standards will become. Do your part for your association by promoting and actively participating in the IAMFES awards program.

\$100,000
in 2000



ANNOUNCING...

An IAMFES Foundation Fund Challenge

The California Association of Dairy & Milk Sanitarians has pledged \$1,000 to the IAMFES Foundation Fund and is challenging other Affiliates and organizations to do the same.

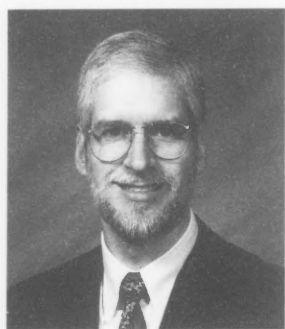
Pass the word... and ask your company or group to Meet the Challenge. Help us reach our goal of \$100,000 in 2000!

Please send your challenges to Lisa Hovey, IAMFES,
6200 Aurora Ave., Suite 200W, Des Moines, IA 50322-2863;
or Phone: 800.369.6337; 515.276.3344; Fax: 515.276.8655;
E-mail: lhovey@iamfes.org.

Thank You!
CADMS

COMMENTARY

FROM THE EXECUTIVE DIRECTOR



By DAVID W. THARP
IAMFES Executive Director

“VOTE at the Annual Business Meeting”

Soon you will be receiving a mailing from IAMFES regarding the proposed Association name change. We are now in the last year of a three-year process to update IAMFES' name. In this column, my goal is to inform you about where we are, where we've been and where we are going!

The mailing mentioned above contains a letter from the Executive Board outlining the upcoming process of changing IAMFES' name to the International Association for Food Protection. We will get to this in a moment, but first, where we have been. We began a process early in 1997 to solicit suggestions for a new Association name that fit with

our mission and our Members' interests. Many names were discussed, with the International Association for Food Protection being selected as the best, all-encompassing name for IAMFES. A timeline was developed to allow for additional Member input and discussion. The proposed name was brought to the attention of attendees at both the 1997 and 1998 Annual Meetings. Overwhelmingly, comments received have been in support of the new name.

During the fall and winter of 1998, legal issues were addressed including necessary changes to the Constitution and Bylaws. All legal issues are in place to allow for a smooth transition to the new name, pending Membership approval. The Constitution and Bylaws Task Force made changes to nearly every section of the Constitution and Bylaws (C&B). The proposed C&B was distributed to our Past Presidents for their comments and individual sections were sent to Committee, Professional Development Group, and Task Force Chairpersons for their review. At the April 1999 Executive Board meeting, the Board voted to accept the amended and restated C&B and present the document to all IAMFES Members for their vote at the IAMFES Annual Business Meeting. That brings us to where we are now.

The amended and restated C&B for the Association will be mailed to each IAMFES Member with a letter from the Executive Board. This provides notification of the upcoming vote. A report from the Constitution and Bylaw's Task Force is included with the mailing and explains the many changes that were made. We have allowed plenty of time for your review and comparison to the current C&B.

So, I believe we have covered where we've been and where we are, now let's look at where we are going. On August 3, at the Annual Business Meeting, a vote will be taken to accept the amended and restated Constitution and Bylaws. Pending acceptance by a simple majority of Members voting at the Business Meeting, a written ballot will be sent to all Members. Members will need to return the ballot in a timely manner to register their vote. Thus, every IAMFES Member will have an opportunity to vote in support of the new name and C&B.

Let us for a moment assume that both the vote at the Annual Business Meeting and the full Membership vote pass, what then is next? The completion of legal filings to change the Association name with government entities will be processed. Beginning January 1, 2000 the new name, International Association for Food Protection will become the name for the Association. Over a period of months, you will notice the new name entering our publications, mailings, Web site, Annual Meeting information and everywhere you now see IAMFES. What an exciting and challenging time for IAMFES! We have the opportunity to shape the future growth of the Association!

It is my hope that I fulfilled my goal of informing you about where we began, where we are now, and where we are going as it relates to changing the Association name. Now you may ask, "what can I do to see the successful completion of this three-year project?" VOTE! Vote at the Annual Business Meeting and return your mail ballot this fall! Also, take the opportunity to talk with colleagues about this very important vote. Tell them you support changing the name to the International Association for Food Protection and encourage them to vote yes!

International Association for Food Protection

Frequently Asked Questions About Changing IAMFES' Name

Q. Why is IAMFES changing its name?

A. In order for IAMFES to grow both internationally and domestically, we need a name that identifies our Association quickly and easily. The Association's name must create a vision for us to be successful in attracting new Members and accomplishing our mission.

Q. How was the name International Association for Food Protection chosen?

A. The Executive Board considered many names before selecting "International Association for Food Protection." This name combines name recognition of *Journal of Food Protection* and describes the focus of our Members, protecting the food supply from contamination.

Q. Legally, what steps are necessary to change the name?

A. To change the name and comply with laws of incorporation, the Articles in our Constitution must be amended and restated; then accepted by the Membership through proper voting procedures.

Q. How do I vote?

A. A vote to amend and restate the Constitution and Bylaws will be taken at the IAMFES Annual Business Meeting (August 3, 1999). Following the approval of a simple majority of the Members voting at the Business Meeting, a ballot will be mailed to Members. Each IAMFES Member will be asked to register their vote by mail with the IAMFES Teller.

Q. When will the new name become effective?

A. Pending a positive Membership vote, the new name will become effective January 1st of 2000.

Q. When was the last Association name change?

A. IAMFES changed to its present name in 1966; more than 30 years ago. Prior to 1966, the Association had 3 other names.

Q. What were prior names of the Association?

A. International Association of Dairy and Milk Inspectors (1911), International Association of Milk Sanitarians (1938), and International Association of Milk and Food Sanitarians (1950).

Q. Will associations affiliated with IAMFES be forced to change their names?

A. No, a review of the names of current IAMFES Affiliate organizations shows a variety of name configurations and there will be no need for Affiliate Associations to follow the new name. It should be noted that Affiliate Associations are welcome to change their name to follow the International's lead.

Q. What can I do to support the change to International Association for Food Protection?

A. Talk with your colleagues about this change and encourage them to vote yes. Yes for a change that will ensure future growth for the Association as we become a more global society. IAMFES has always served its Members by sharing information on protecting the worldwide food supply. The International Association for Food Protection will continue fulfilling our Association's mission for years to come!

Our mission is:

*"To provide food safety professionals worldwide
with a forum to exchange information on protecting the food supply."*

Degradation of Potassium Sorbate in Vegetable Spread by *Trichoderma Harzianum* Rifai

M. N. U. Eiroa,* A. L. Rocha, and L. Pfenning

SUMMARY

Samples of a vegetable spread taken from a supermarket in São Paulo, Brazil, that had a strong off odor and altered appearance were examined to investigate the origin of the spoilage. Direct microscopic examination revealed the presence of mycelia. The product was inoculated into potato dextrose agar medium (PDA) with added antibiotics to isolate molds, and the concentration of the potassium sorbate used as a preservative was determined. The only species of mold isolated was inoculated onto simple PDA plates and onto PDA plates with added potassium sorbate at the following levels: 0.10%, 0.15%, 0.20%, and 0.25%; the plates were incubated at 25°C for 5 days. The mold was also inoculated into samples of unspoiled vegetable spread containing 0.1% potassium sorbate. Half of the samples were incubated at 25°C for 5 days and half at 7°C for 14 days. Spoilage was very fast at 25°C but was prevented by refrigeration at 7°C. In spoiled vegetable spread samples, only traces of sorbate were detected, suggesting degradation of the preservative. The mold was identified in oat agar medium incubated at 25°C for 5 days. The mold that was isolated and assumed to be the source of the deterioration, which was identified as *Trichoderma harzianum* Rifai, was resistant to all concentrations of potassium sorbate tested. When samples of spoiled and unspoiled vegetable spread were examined by mass spectrometry to identify the compound responsible for the off odor, the compound was identified as 1,3 pentadiene originating from the decarboxylation of potassium sorbate.

INTRODUCTION

Sorbic acid is an additive of which the use is permitted in a wide variety of food products, including concentrated fruit juices for soft drinks, bakery products, jams and jellies, mayonnaise, margarines, cheeses, fruit juices, soft drinks, and wines. Its main use is as a fungicide because it is more effective in the control of yeasts and molds than in the control of bacteria, although some bacteria are sensitive to this preservative (5, 8, 16). Sorbic acid is usually used in the form of its potassium salt, which is more soluble than the free acid; it is considered non-toxic to humans within the established limits stipulated by law, being metabolized via pathways for the β -oxidation of fatty acids (6, 20). Sorbic acid can be added directly to the food or incorporated into the packaging material.

Some molds, as well as lactic and acetic bacteria, can use sorbic acid as their sole carbon source, (15) and are capable of degrading it, producing odors similar to the odor of geranium and also to stronger odors, previously described as being similar to the odors of acrylic paint, paint solvent, kerosene, or hydrocarbons. However, in some cases the fungi are

resistant to the sorbate without degrading it, the resistance being due to an active transport system as in the yeast *Zygosaccharomyces baillii* (27).

According to Marth (18), some *Penicillium* strains can grow in the presence of 7100 ppm of potassium sorbate (equivalent to 500 ppm sorbic acid). The same author related that some strains of *Penicillium* are capable of detoxifying sorbic acid and producing 1,3 pentadiene, which has a disagreeable strong odor. Some strains of *Penicillium roquefortii* have also been shown to be capable of growing in the presence of sorbate (17). Strains of *Mucor* isolated from the soil have also been incriminated as producers of trans-4-hexenol from sorbic acid, and strains of *Geotrichum* have been shown to produce 4-hexenoic acid, ethyl sorbate and 4-hexenol (13). Lactic bacteria have been incriminated in the production of 2-ethoxyhexa-3,5 diene in wines and associated with the production of an odor similar to that of geranium (3, 22) and 4-hexenoic acid (26). Other compounds with disagreeable odors occasionally present in wines as a result of sorbic acid degradation can be 2, 4 hexadien-1-ol, 3, 5 hexadien-2-ol, 1,3 pentadiene and/or 1 ethoxyhexa 2,4, diene (12). *Penicillium cyclopium*, *P. roquefortii*, *P. viridicatum*, *P. puberulum*, *P. crustosum* and *P. lanosoviride*, all isolated from spoiled cheese, have also been cited as capable of attacking sorbic acid (9).

Penicillium roquefortii and *Trichoderma* spp. were identified by Samson (24) and by Samson et al. (25) as contaminants of vegetable spreads that are apparently resistant to sorbate. The objective of this research was to investigate the causes of deterioration of vegetable spread preserved by potassium sorbate and the resulting production of a strong disagreeable odor.

MATERIALS AND METHODS

Samples of vegetable spread from a deteriorated batch, taken from

a supermarket in the city of São Paulo after complaints by consumers, were examined. The samples showed alterations in appearance and a strong odor resembling acrylic paint.

Microscopic examination

A small portion of the vegetable spread removed from the surface of one of the deteriorated samples and showing an accentuated yellow color, porous appearance, small greenish spots near the edge of the package, and a thin translucent superficial film was submitted to direct microscopic examination using a phase contrast microscope.

Mold isolation and identification

Successive decimal dilutions of a sample of the deteriorated vegetable spread were inoculated onto potato dextrose agar plates containing antibiotic, according to the methodology recommended by Mislivec et al (21), and incubated at 25°C for 5 days.

The isolated mold was cultivated in oat agar and incubated at 21-25°C for 3 to 4 days. After incubation, the mold's morphology was studied by direct microscopic examination and its taxonomic position determined.

Attempts to reproduce the deterioration

Four 25 g portions of samples taken from an undeteriorated batch of the vegetable spread were inoculated with a pure culture of the single mold species isolated from the altered product as described before. Two of these were incubated at 25°C for 5 days and two at 7°C for 2 weeks. All the samples were observed periodically for changes in appearance and production of off odors.

Resistance to potassium sorbate

The potassium sorbate level in the deteriorated vegetable spread was determined using the methodology recommended by Gwan and Konter (10). Plates of potato dextrose agar containing 0%, 0.10%,

0.15%, 0.20% and 0.25% of potassium sorbate were prepared and the isolated mold was inoculated onto the surface of each plate and incubated at 25°C for 5 days. A concentration of 0.10% potassium sorbate was chosen as the starting point, because this was the concentration used in the deteriorated product, according to the manufacturer, and is the maximum amount permitted in margarines under current Brazilian legislation (1).

Identification of off odor

To identify the component responsible for the off odor, samples of the deteriorated vegetable spread of laboratory-contaminated vegetable spread, and from an undeteriorated batch were submitted for gas chromatography/mass spectrometry analysis with a Hewlett Packard GC/MS model 5890/5970 equipped with an Ultra 2 HP column (25 m × 0.2 mm × 0.33 µm thick film), with helium used as carrier gas. The pressure at the head of the column was 10 psig. The chromatographic conditions were: 70°C for 2 min, 70°C to 120°C at 5°C/min, 120°C to 260°C at 10°C/min; photo multiplier of 1,800 V.

Five grams of the product were mixed with 2.5 g anhydrous sodium sulphate in a 25 ml flask, which was sealed and heated to 45 to 50°C, after which 10 µl of the head space gas was inoculated into the head space of the GC/MS column.

RESULTS AND DISCUSSION

Isolation and identification of molds

Direct microscopic examination revealed the presence of a compact mass of mold hyphae.

A single type of mold, isolated from plates containing potato dextrose agar plus antibiotic, presented as white colonies with abundant mycelia. The microorganism developed quickly in the oat agar medium, the colonies attaining a diameter of 30 mm after 5 days incubation.

Figure 1. GC/MS head space from normal smelling vegetable spread

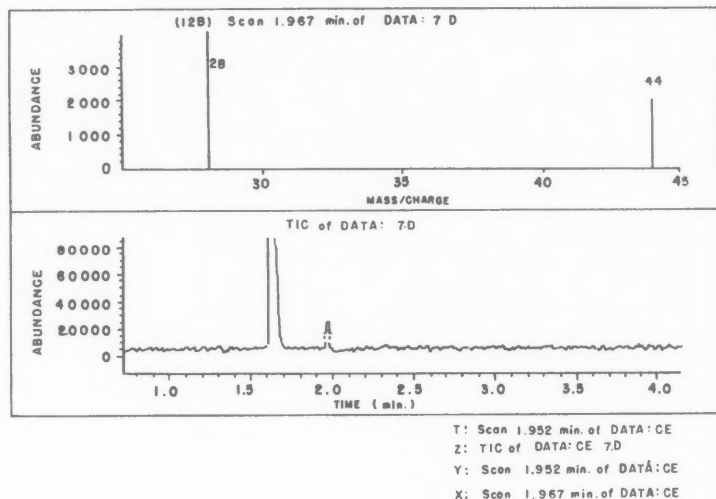
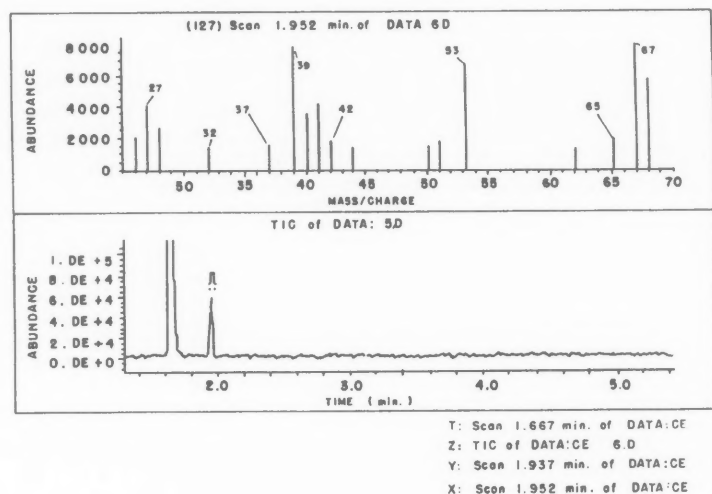


Figure 2. GC/MS head space from foul smelling vegetable spread



tion at 25°C. Both submersed and aerial hyaline mycelia were observed. Sporulation was observed after 3 to 4 days of incubation, during which time the culture became greenish. The conidiophores were considerably branched and the phialides always in groups, but of variable form. The conidia were subglobose or ovoid, smooth, and

measuring 2.8-3.2 × 2.5-2.8 μm. The taxonomic position was determined as *Trichoderma harzianum* Rifai (2, 23). This mold has a cosmopolitan distribution, frequently occurring in soil and other organic substrates (7), as well as having been isolated from paper, clothing, and gasoline. The conidia germinate under acid conditions and in media

with high osmotic potentials. Germination is inhibited in alkaline media containing bicarbonate ions.

Trial aimed at reproducing the deterioration

The vegetable spread samples from the unaffected batch, inoculated with the isolated mold and incubated at 25°C, presented an abnormal appearance after 72 hours, with development of a strong, disagreeable odor similar to that produced by the deteriorated batch.

When the samples from the same batch were inoculated and stored under refrigeration, they showed no changes after 2 weeks. However, when the temperature was changed to 25°C, they developed changes in appearance and an intense disagreeable odor after an additional 72 hours.

Resistance of the mold to potassium sorbate

Only traces of potassium sorbate were found in the deteriorated samples. Vigorous growth of the mold was observed on all the plates containing different concentrations of potassium sorbate, even when the concentration was 0.25%, along with an intense disagreeable odor similar to that of the deteriorated samples. The development of the mold in potato dextrose agar containing no added potassium sorbate produced no odor.

Identification of the off odor

The only impurity detected under the analytical conditions used was the compound (RT approximately 1.9 min) with a probable molecular weight of 68. Because of the limited amount of sample it was possible to inject, the intensity of the fragments of mass was low and it was not possible to determine the peaks corresponding to the isotopic contribution. The m/z peak of greatest value was that of 68; this was therefore considered the molecular ion. For a molecular ion of m/z 68, the following compositions are pos-

sible: C_5H_8 , C_4H_4O , $C_3H_4N_2$, C_3O_2 , CH_2ClF . Figure 1 shows the GC/MS of the head space of a normal vegetable spread. Figure 2 shows the GC/MS of the vegetable spread with the peak of an impurity not present in the normal product.

Some of these hypothesis can be eliminated by a simple analysis:

- (a) The chlorinated samples were excluded because no characteristic chlorine profile was perceptible. In this case, a peak should appear at m/z 70, corresponding to the contribution of the isotope ^{37}Cl , with an intensity of approximately 1/3 of the peak at m/z 68.
- (b) The formula C_3O_2 presents a single possibility, carbon suboxide, a highly reactive product that reacts instantly in the presence of water to form malonic acid. Because the vegetable spread was an emulsion containing approximately 30% water which separated out on heating during sample preparation of the sample, this possibility was discarded.
- (c) Compounds with the formula $C_3H_4N_2$ (pirazol and imidazol) show no peaks at m/z 53 in their spectra, according to information obtained from the NBS43K library; a fragment with M/Z 53 was present in the impurity under investigation. The compound methylene aminoacetonitrile has a melting point of 128 to 129°C, which would greatly hinder its ability to vaporize into the head space; during the preparation of the sample, it was shown that the impurity was easily volatilized at around 40 to 45°C. As a result of this observation, the likelihood that the impurity was methylene

aminoacetonitrile can be considered negligible.

- (d) Compounds with the formula C_4H_4O could be furans or 3-buten-2-ones. Furans present a mass spectrum considerably different from that of the impurity, the molecular ion being the most intense of the spectrum. It was not possible to eliminate the possibility of the product being 3-buten-2-one because there is no spectrum in the available literature for comparison. However, the methylketones generally present an intense peak in their mass spectra (generally the most intense of the mass spectra) at m/z 43, which is attributed to CH_3CO . The mass spectra of the impurity did not present a peak at m/z 43; thus the possibility of the impurity being 3-buten-2-one can be eliminated.
- (e) Compounds with the formula C_5H_8 could correspond to at least a dozen hydrocarbons, that according to McLafferty (19) show very similar mass spectra; therefore identification is possible only by comparison with standards.

By comparison with spectra from the NBS43 K library, it was possible to eliminate the following possibilities: (1) methylmethylene cyclopropane, (2) 3-methyl 1-buten, (3) 3-methyl 1,3 butadiene, (4) 3-methyl 1, 2 butadiene, (5) methylene cyclobutane, (6) 1, 4 pentadiene, (7) 1-penten, (8) 2-penten, (9) 1,2 pentadiene, (10) cyclopentene, (11) spiropentene, and (12) 2, 3 pentadiene.

The possibility associated with the greatest level of confidence was for the product 1, 3 pentadiene, which has two isomers: E 1, 3 pentadiene and Z 1, 3 pentadiene.

The standards of these two isomers were therefore submitted to GC/MS, and it was shown that the spectrum of Z 1, 3 pentadiene was considerably different from the spectrum of the product under investigation, principally with respect to the most intense ion, which was m/z 67 in the Z 1, 3 pentadiene GC/MS spectrum, whereas in the impurity the most abundant ion was m/z 39.

The spectrum of E 1,3 pentadiene was similar to that of the impurity; thus this structure was accepted as being that of the impurity. The same results were obtained from the laboratory-contaminated samples.

The results of this study showed that the mold *T. harzianum* Rifai was responsible for the deterioration of the vegetable spread under study, through decarboxylating the potassium sorbate present in the product and transforming it during storage under inadequate conditions of refrigeration storage into *trans*-1,3 pentadiene, which has a disagreeable odor.

The results obtained are in accordance with those cited in the specialized literature, although the molds associated with this type of alteration have been mainly species of *Penicillium* (4, 9) and occasionally of *Mucor* (13).

The *trans*-1,3 pentadiene produced by the *Penicillium* isolated from cheese treated with sorbate showed no mutagenic activity (14). However, Horwood et al. (11) consider that, despite absence of any accounts of carcinogenic effects of this hydrocarbon, its presence in foods should be treated with caution, because the molecule is very similar to 1, 3 butadiene, which has mutagenic activity and which is metabolized by mammals to 1, 2 epoxi 3 butane and 1, 2, 3, 4 di-epoxi-butane, both of which are carcinogenic.

As preventative measures to avoid this type of problem from reoccurring, it is recommended that: (1) the cleaning operations and sanitation of the equipment be optimized, (2) a constant monitor-

ing for the presence of potassium sorbate resistant molds be established in the processing industries of foods preserved by this additive, and (3) as much as possible, conditions of storage and refrigeration at the distribution outlets be controlled.

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New *Listeria* Control Measures Under Consideration

Jerry L. Welbourn and John Williams, Jr.

Following high-profile foodborne illness outbreaks of *Listeria monocytogenes* in the 1980s, a coalition of processors, regulators, and industry associations launched a series of campaigns to reduce the incidence of listeriosis in the United States. Their efforts were so successful that a Centers for Disease Control and Prevention (CDC) report, covering 1988 to 1992, attributed one small foodborne illness outbreak to *Listeria monocytogenes*.

This decade-long "detente" with *Listeria monocytogenes*, however, was recently obliterated. Over a recent three-month period, 10 product recalls and one devastating outbreak, claiming 20 lives, were attributed to *Listeria monocytogenes* in meat products. Stunned by the severity of the outbreak and double-digit recalls, processors, regulators, and industry groups are once again pooling their resources to combat this ubiquitous microorganism.

The following article will provide an overview of *Listeria monocytogenes*, its prevalence in foods, and renewed efforts to control its growth and survival in foods.

Characteristics of *Listeria monocytogenes*

Listeria is found throughout the environment – in water, soil, plants, silage, and dust – and is the source of infection in a wide variety of animals, including cattle, sheep, birds, rodents, and humans.

Listeria monocytogenes is the only species of *Listeria* genus that is a food pathogen, but other species, such as *L. innocua*, *L. seeligeri* and *L. welshimeri* are also found in foods and plant environments. The presence of these species are considered indicators for the possible presence of *L. monocytogenes*.

A psychrotroph, *L. monocytogenes* can survive and grow at refrigeration temperatures as low as 32°F. It thrives in a broad pH range of 4.6 to 9.2, has a minimum water activity for growth of 0.93-0.92, and is killed at pasteurization temperatures.

Unlike other prominent foodborne pathogens (i.e., *Salmonella*, *Campylobacter*, *Shigella* and *E. coli* O157:H7), *L. monocytogenes* causes relatively few illnesses in humans (Table 1). It has been associated with such foods as raw milk, cheeses, ice cream, raw vegetables, fermented raw-meat sausages, raw and cooked poultry, raw meats, and raw and cooked fish.

TABLE 1. Leading causes of foodborne illness and deaths in the United States

1997 (Year)	Confirmed cases	Cases (per 100,000)	Hospitalizations	Deaths
<i>Campylobacter</i>	3,974	24.7	397	1
<i>Salmonella</i>	2,205	13.7	463	13
<i>Shigella</i>	1,273	7.9	165	1
<i>Cryptosporidium</i>	468	2.8	NA	2
<i>E. coli</i> O157:H7	340	2.1	99	4
<i>Yersinia</i>	139	0.9	21	NA
<i>Listeria</i>	77	0.5	68	15
<i>Vibrio</i>	51	0.3	5	NA
<i>Cyclospora</i>	49	0.3	NA	NA
Total	8,576	50.1	1,270	36

Source: FoodNet

TABLE 1. Percentage of Class I - III microbiological recalls, by agent, January 1998 to December 1998

Cause	Percentage
<i>Listeria</i>	53.6%
<i>Salmonella</i>	23%
Yeast and Mold	10.4%
<i>E. coli</i> O157:H7	5%
<i>C. botulinum</i>	2%
Lactic bacteria	2%
Coliforms	2%
Other	2%

Source: FDA Enforcement Reports

While the minimum infectious dose for *L. monocytogenes* is unknown, it is probably consumed routinely at low levels by nearly everyone without causing illness. Listeriosis poses minimal risks to most healthy individuals, yet outbreaks are usually characterized by a high mortality rate of 20% to 40%.

Listeriosis poses a definite risk to individuals with weakened immune systems and pregnant women. About one-third of human infections are perinatal, involving pregnant women and their unborn or newly born infants.

In a 1985 California outbreak involving Mexican-style cheese, a majority of the recorded deaths were pregnant women and their fetuses.

The primary manifestations of listeriosis include flu-like symptoms, meningitis, abortion, and perinatal septicemia. The time between ingestion and symptoms may vary from as little as one day to several weeks. Onset time varies with a person's susceptibility, the number of organisms consumed, the ingested food, and virulence of the particular strain.

Daunting Challenge for Processors

Listeria monocytogenes is a unique food pathogen of utmost importance to the food industry. It is also a dichotomy of sorts; in 1998

L. monocytogenes ranked near the bottom of reported foodborne illness cases, but was the leading cause (45% to 65%) of microbiological product recalls (Table 2).

Due to its psychrotrophic and ubiquitous nature, *L. monocytogenes* is a difficult and ongoing problem for many food processors. The cool and damp environments found in meat, poultry, dairy, and produce plants are ideal for its growth. Floors, drains, wash areas, cleaning utensils, walls, ceilings, condensate, and product contact surfaces are leading sources of *L. monocytogenes* contamination in processing facilities.

Controlling the growth and spread of *Listeria* is a daunting challenge for processors. Recommended control measures for *L. monocytogenes*, which are endorsed by a broad cross-section of food industry groups, health organizations, and regulatory agencies include:

1. **Temperature.** Keep ingredients, raw materials, and products as cool as possible (below 40°C) during processing, storage and distribution.
2. **Time.** Bacteria require time to grow. Processors must move raw materials and finished product through the plant as quickly as possible.
3. **Cleaning and Sanitizing.** Clean plants translate into

safe products. The effectiveness of all cleaning and sanitizing functions must be verified through pre-operational inspection and environmental testing.

4. **Process.** Processors with a kill-step, such as cooking and irradiation, must verify the process and prevent post-processing contamination. Processors lacking a kill-step must consider other control measures, such as antimicrobials, to prevent contamination and the growth of pathogens.
5. **Prerequisite Programs.** These programs include sound quality control programs, good manufacturing practices (GMPs), employee training, effective insect and rodent control, effective process controls and preventive maintenance, and a coding and tracking program.
6. **Environmental Testing.** To verify the effectiveness of cleaning and sanitizing activities in the processing environment and determine if *Listeria* is present, environmental testing is invaluable. Forewarned is forearmed. Drains and floors should be tested initially. If *Listeria* is discovered in these sites, testing should be expanded to ascertain the extent of the problem.
7. **Employee Hygiene Practices.** A large percentage of humans are apparent carriers of *L. monocytogenes*. This fact alone promotes the importance of good employee hygiene practices along with the verification and monitoring of effective handwashing techniques.
8. **Hazard Analysis and Risk Assessment.** This should be done regularly for all processes, even if the facility lacks a HACCP plan. A well-run facility should know where all their hazards and risks are if they are to be effectively controlled. It is difficult to control what is not identified.

9. Farm-to-Table Controls.

The transfer of products from the farm to consumers is rife with opportunities for temperature abuse at every point of the distribution chain. Low levels of *L. monocytogenes* in finished products can multiply rapidly if proper temperatures are not maintained at each point of the food distribution chain. Food handlers, including consumers, must be educated on the inherent dangers of product temperature abuse.

10. **HACCP.** The centerpiece of a food safety program, but all of the other prerequisites are just as important.

New Agenda for *Listeria*

In 1989, over the objections of a host of food manufacturers, the Food and Drug Administration (FDA) and the Food Safety and Inspection Service (FSIS) established a "zero" tolerance policy for *L. monocytogenes* in ready-to-eat (RTE) meats.

Since that time, FSIS has analyzed over 3,000 RTE samples (i.e., beef jerky, roast beef, sliced ham and luncheon meat; dry and semi-dry fermented sausage; cooked, uncured poultry, etc.) each year for *L. monocytogenes*. Last year, approximately 2.5% (90) out of 3,547 RTE samples tested positive in the FSIS monitoring program.

Statistically, noteworthy gains have been made against *Listeria*. But more control measures are obviously needed.

The FDA, in conjunction with the United States Department of Agriculture (USDA), is conducting a quantitative risk assessment for *L. monocytogenes* that will focus primarily on refrigerated, RTE foods. The risk assessment will:

- (1) Determine consumers' exposure to the pathogen through the food supply.
- (2) Assess the relationship between the levels of the pathogen ingested and the incidence of illness.
- (3) Determine the foods that pose the greatest risk to consumers and specific sub-

populations at increased risk of contracting listeriosis.

- (4) Assess the role that refrigerated shelf life has on the risk of listeriosis from the consumption of high-risk products.
- (5) Identify research needs and priorities.

The comprehensive risk assessment is scheduled to be completed later this year.

In another move, the FDA formed a committee in February to evaluate the adequacy of the *L. monocytogenes* monitoring program and develop new safety recommendations.

Under the direction of Dr. John E. Vanderveen, a former FDA administrator, the committee will also evaluate the possible development of a "best practices" guide for preventing listeriosis, labeling requirements pertaining to "sell-by" and "pull-by" dates, and public education programs. A research project to determine if the extended shelf life of products is increasing the risk of foodborne illness will also be helmed by the committee.

SUMMARY AND CONCLUSION

Following a virtual 10-year absence, *L. monocytogenes* is back in the national headlines in a big way. Thus far, regulators and food processors are faring well under massive media scrutiny and have resisted resorting to scatter-gun approaches in addressing the current *L. monocytogenes* dilemma.

The FDA-USDA risk assessment program, and the formation of working committees are positive steps in preventing the promulgation of inappropriate policies and regulations.

Controlling *L. monocytogenes* is a very complex task. Time, patience, and the adoption of calculated, science-based programs are key to unraveling its complexities.

ABOUT THE AUTHORS

Dr. Jerry L. Welbourn and John Williams, Jr. are director of information services and senior communications specialist, respectively, at Silliker Laboratories Group, Inc.

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ISO 9002 Labs Deliver Test Results You Can Trust

Edward Arnold

As a food manufacturer, your greatest asset is product quality. You're continually seeking assurance that your product has the optimum composition, maintains a sufficient shelf life, is free of harmful pathogens and more. Systematic, reproducible analytical testing can give you confidence in your product quality or help you identify areas in need of improvement.

There's an endless list of analytical testing labs to help you with this process. But how do you ensure that the lab you choose will give you the reliable, consistent and accurate results you need to assess your product quality?

ISO 9002 certification is one surefire way to know that a lab will provide you with trustworthy results every time.

WHAT IS ISO 9002?

As part of the ISO 9000 series of international quality management and quality assurance standards, ISO 9002 ensures that a company controls all aspects of the production process that impact quality.

ISO 9002 certification requires a company to establish, implement and maintain a documented quality management system. It's a rigorous process monitored by an external certified auditor who reviews and critiques the quality system. Companies that have undergone the certification process are described as "ISO 9002 registered" or "ISO 9002 certified."

Analytical testing laboratories that implement ISO 9002 systems typically follow Guide 25, a guideline designed to help interpret how to apply ISO 9002 principles to testing and calibration laboratories. Guide 25 is intended for specific tests and does not indicate quality procedures for an entire laboratory.

Many labs simply follow the basic precepts outlined by Guide 25 for specific assays, without going through the ISO 9002 certification process. They may describe themselves as "Guide 25 compliant," "ISO 9002 compliant," "ISO 9002 accredited," or even "Guide 25 accredited," often causing confusion for their customers. In fact there is no certification or registration process for Guide 25.

Labs that are truly ISO 9002 registered or certified have distinct benefits for food manufacturers.

WHAT ARE THE BENEFITS OF ISO 9002?

The real benefit of ISO 9002 is not the documentation of processes, as many people assume, but rather the thoroughness, attention to detail and verification that ISO brings to the lab environment. The ISO process helps to give you complete confidence in your test results.

Thoroughness

ISO 9002 requires that all processes be documented and that all steps in the process be verified, including such things as equipment settings, room temperature and purchased supplies.

If an error does occur, this standardization makes it easy to spot early and react quickly. Any non-conformance results in a "corrective action." The problem, reason and method of correction are spelled out, and changes are made immediately. The lab has a vested interest in solving problems the first time, since recurrences without appropriate action could result in probation or loss of ISO 9002 status. Each corrective action improves the lab's overall quality control process. This continuous improvement process is a cornerstone of the ISO 9002 system.

ATTENTION TO DETAIL

Precise attention to detail is maintained throughout the testing process. When you first send in a sample, the lab will conduct a contract review confirming which tests will be conducted and the method to be used and clarifying any special requirements. Your request will be reviewed for accuracy, completeness, conditions of the sample and more. Clarifying expectations improves service because your work order and your expectations are constantly checked and double-checked.

A Quality Assurance Manual is available for customers to review, detailing all aspects of the operation. This includes an organizational chart, a list of each employee's educational background and experience, and accountability for all quality assurance functions. Quality control measures, method references and the process for identifying, tracking, storing and reviewing data are also provided.

And, every time you talk with an ISO 9002 certified lab, the conversation is documented, specifying who talked with you, the topic and any next steps.

VERIFICATION

The ISO process incorporates steps that improve objectivity and increase accuracy. At R-TECH Laboratories, for example, test data and results are reviewed by at least four people, in addition to the analyst, before being sent to the customer. And when customers call with questions, they are referred to

technically qualified customer service personnel, not the analyst who conducted the test, to maintain objectivity.

You can be confident of an ISO-registered lab's performance because it is audited in several ways.

The quality control staff and other groups within the lab conduct monthly internal audits. On a quarterly basis, management reviews the entire system (tests, personnel, equipment, facility, customer service and purchasing, etc.).

External audits are another checkpoint. Registered auditors review and critique selected areas of the quality system every six months and review the entire process every two years. They look at reports from internal audits and the management review process as well as the corrective action file, verifying the system is in compliance.

Even customers can audit the system if they so choose.

ISO 9002 certified labs go to great lengths to increase the validity and reliability of analytical tests. In other words, certified labs say what they will do, do it, and then prove that it was done. As you evaluate your products, this consistent, reproducible testing process gives you information you can trust and helps ensure that you're delivering the safest and highest quality food products possible.

ABOUT THE AUTHOR

Edward Arnold, Manager of Analytical Services at R-Tech® Laboratories.

OFFICIAL NOTICE

for Members of the International Association of Milk, Food and Environmental Sanitarians

A vote will be taken at the IAMFES Business Meeting
on the proposed name change and related revisions
to the Constitution and Bylaws.

Tuesday, August 3, 1999 - 4:00 p.m.

Dearborn, Michigan

The proposed name is:

International Association for Food Protection

Further information will be mailed to Members.

Use of Microbial Risk Assessment to Improve Food Safety

Donald W. Schaffner

IAMFES recently sponsored a workshop entitled "An Insider's Look at Microbial Risk Assessment" which was attended by more than 30 food industry professionals, government officials and others. This workshop featured presentations by Mr. Greg Paoli, Principle in Decisionalysis Risk Consultants, Inc.; Dr. Ewen C.D. Todd, Health Protection Branch, Health Canada; Dr. Robert M. McDowell, Risk Analysis Systems USDA-APHIS; Dr. Richard C. Whiting, Food and Drug Administration; Dr. William H. Ross, Bureau of Biostatistics and Computing Applications, Health Canada, and the author.

Microbial Quantitative Risk Assessment (QRA) is a new, rapidly evolving tool which has important implications for HACCP, food safety regulations, as well as research and teaching. Microbial QRA can be thought of as the next step in the evolution of HACCP, as hazard analyses become more quantitative and less qualitative. It has already impacted the development of new regulations for shell eggs, and gives every indication of playing a key role in the development of other regulations. With QRA's need for quantitative microbiological data, it makes use of existing mathematical models for microbial behavior, but may also drive non-modeling research in a more quantitative direction. Since QRAs summarize and show interactions between large sets of data, they also make useful teaching tools for showing the effects of small or large changes in different aspects of the food production system. Microbial QRAs are already an important part of the world's food safety system and this article will summarize some of the key issues discussed in the IAMFES sponsored workshop. The author's remarks summarize those of the other presenters and ideas presented here are those of the original presenters.

The Basics of Microbial QRA

Risk assessments can serve several purposes, the first being estimating the chance that an undesirable event (i.e., a case of food poisoning) will occur. Once this estimate is known, various strategies for reducing that risk can be evaluated using the computer software used to create the risk assessment. Risk assessments may also identify data gaps where more research is needed. The inputs to the risk assessment process are typically derived from the scientific literature, unpublished data or expert opinion. Microbial risk assessment outputs can include estimates of the number of contaminated food samples, levels of microbial contamination and/or the expected number of foodborne disease cases.

Probabilistic Analysis

One key feature of most current risk assessments is their probabilistic rather than deterministic nature. While deterministic analysis of risks is generally quick and easy to understand, its use is commonly limited to screening risks, rather than conducting formal risk assessments. This is because deterministic analysis doesn't consider variability in model inputs and thus promotes a false sense of certainty in the conclusions. On the other hand, probabilistic analysis evaluates many different possibilities, captures the variability that exists in the real world, and allows for the uncertainty present in the data to be accounted for in the results of the risk assessment. Software capable of performing Monte Carlo simulation is typically used for probabilistic analysis. Two popular software packages are @Risk (Palisade Corporation, www.palisade.com) and Crystal Ball (Decisioneering, Inc., www.decisioneering.com) both of which function as "add-ins" to many popular spreadsheet programs.

Hazard Identification and Prevalence Estimation

The first step in the risk assessment process is hazard identification. This step is largely qualitative, and serves to establish the scope and focus of the risk assessment. Evidence from reported outbreaks could be used to identify possible contamination mechanisms, controlling factors, implicated foods, and estimated doses. All of this information serves as a useful underpinning to the risk assessment process, and is refined and made more quantitative as the process continues.

Prevalence estimation is also important as an early step in the risk assessment project. In this step, information on the prevalence of the infectious agent is used. As part of this process, the starting point for the risk assessment must be determined. For example, in the recent USDA *Salmonella* Enteritidis in eggs risk assessment (www.fsis.usda.gov/OPHS/risk/index.htm), the decision was made to start the risk assessment at the farm. If flock prevalence were not known, but prevalence in laid eggs were known, then the decision could have been made to start the risk assessment with the egg, rather than the chicken.

Modeling Exposure, Preparation and Consumption

Modeling exposure pathways can be quite complicated, and for many foods will require separate treatment for the different market segments (e.g. commercial processing, foodservice, retail and home use, etc.). Models for microbial growth and survival become very important in this part of the risk assessment process. Free microbial modeling software is available from the USDA Eastern Regional Research Center (www.arserrc.gov/mfs) and commercial software is available from Leatherhead Food Research Association, Surrey, England (www.lfra.co.uk/lfra/micromod.html). Key issues in preparation and consumption include differences between home and institutional use, product shelf life, retail storage temperature, cross-contamination, consumption levels, preparation practices, cooking styles and practices.

Dose-Response Assessment

The last portion of the risk assessment is the dose-response assessment. This part of the process is in many ways the most complex. Data for constructing dose-response models are notoriously hard to come by. Many datasets come from feeding trials on prisoners published many years ago. Other datasets come from actual foodborne outbreaks or animal experiments. Each

type of dataset has its own particular disadvantages, and many datasets have a high degree of variability, making model selection particularly challenging. In the IAMFES workshop, Dr. William H. Ross presented a Weibull dose-response model whose shape is determined by two factors. These factors are β , which is influenced by microbial taxonomy and can be modeled as a random coefficient and κ , which can be modeled as a function of risk factors (i.e., age, health status, stomach contents, etc.).

Risk Management Strategies

Risk assessments are not typically conducted as an end in themselves, but as inputs into the risk management process. It is the risk managers who must determine, based on the results of the risk assessment, and other factors, what is to be done about a particular problem. Risk managers must consider "to what level is a particular risk to be managed?" If possible, risk should be eliminated, but that may not be possible. If a particular risk can't be eliminated, then a "tolerable" or "acceptable" level of risk must be determined. Tolerable levels of risk should be set after taking into account the severity of the risk, the size of the population at risk, and the uncertainty associated with the estimated level of risk.

An Alternate Approach: Using Analytica

The workshop concluded with a discussion of tools other than the spreadsheet add-in products mentioned above. One such alternative tool is the program Analytica, available from Lumina Decision Systems, Inc. (www.lumina.com). Analytica provides a visual modeling environment which is hierarchical, object-oriented and which has better documentation capacity than the spreadsheet add-ins. Because of Analytica's object-oriented hierarchical nature, management of very complex models is improved. One additional benefit compared to the conventional approach is that Analytica-based risk assessments can be viewed using free software provided by Lumina. This allows for easier distribution and simplifies the task of risk assessment scrutiny by others.

About the Author

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* The author's remarks summarize those of the other presenters and ideas presented here are those of the original presenters.

Call for Symposium

2000 IAMFES Annual Meeting

August 6-9, 2000

Atlanta, Georgia

The Program Committee invites IAMFES Members and other interested individuals to submit a symposium proposal for presentation during the 2000 IAMFES Annual Meeting, August 6-9, 2000 in Atlanta, Georgia.

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 IAMFES 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 the IAMFES office for receipt no later than July 15, 1999 or by presenting the proposal to the Program Committee at its meeting on Sunday, August 1, 1999 in Dearborn, Michigan. Proposals may be prepared by individuals, committees, or professional development groups.

The Program Committee will review submitted symposium and organizers will be notified by October 1, 1999 as to the disposition of their proposal.

PRESENTERS WHO ARE NOT MEMBERS

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

IAMFES FOUNDATION SPONSORSHIP

The IAMFES Foundation has limited funds for travel sponsorship of presenters. Symposium 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 IAMFES will provide recognition for these groups in our program materials. Organizers are asked to inform IAMFES if they obtain outside funding.

HAVE AN IDEA BUT YOU ARE UNABLE TO ORGANIZE IT?

Many IAMFES Members have excellent suggestions for symposium 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. Symposium topics are among the most valuable contribution an IAMFES Member can make to assure the quality of our Annual Meeting.

WHO TO CONTACT:

David Golden, Program Committee Chairperson
University of Tennessee
Department of Food Science and Technology
2605 River Road, Knoxville, Tennessee 37901-1071
Phone: 423.974.7247; Fax: 423.974.2750
E-mail: dgolden@utk.edu.

Symposium Proposal

2000 IAMFES Annual Meeting

August 6-9, 2000

Atlanta, Georgia

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 15, 1999 to:

IAMFES, Symposium Proposal
6200 Aurora Avenue, Suite 200W
Des Moines, IA 50322-2863, USA

Submit in person
on August 1, 1999 to:

Program Committee
IAMFES 86th Annual Meeting
Dearborn, Michigan

or Contact:

David Golden, Program Committee Chairperson
University of Tennessee
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2605 River Road
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E-mail: dgolden@utk.edu.

Highlights

of the Executive Board Meeting

April 17 - 19, 1999
Des Moines, Iowa

Following is an unofficial summary of Executive Board actions from the IAMFES Executive Board Meeting:

Approved the following:

- Minutes of January 24-25, 1999 Executive Board Meeting.
- Commercialism policy for *JFP* and *DFES*.
- Committee Chairperson and Member assignments.
- Formation of a Retail Food Safety and Quality PDG.
- Resolutions to amend and restate the Constitution and Bylaws to change the name of the Association to the "International Association for Food Protection."
- Disallow press passes for IAMFES workshops and Annual Meeting.
- Signing of agreement with IAFIS related to translating 3-A Standards and making available on the Internet.
- Financial Update: January 1999 financial statements were reviewed. Good comparisons to budget.
- Staffing Update: Reviewed staff reorganization.
- Policy and Procedures Manual - update plan.
- HACCP Task Force - reviewing HACCP Manual.
- Encourage Committees (etc.) to nominate Members for Awards.
- Board Member attendance at Affiliate meetings.
- Affiliate Newsletter - spring 1999.
- Formation of new IAMFES Affiliates.
- Update on 1999 Annual Meeting planning.
- Planning for 2000, 2001 and 2002 Annual Meetings; future Annual Meeting sites.
- "An Insider's Look at Microbial Risk Assessment" Workshop held April 12 and 13 in Washington, D.C.

Discussed the following:

- E-mail votes taken since the January Executive Board Meeting.
- Communication Update: Journals remain on schedule, decline involvement in SCI program, discussed multi-media survey and Web site statistics.
- Membership Update: Membership increasing, Web site cited as a plus, discussed alternative Membership categories, Membership control of Association issues.
- Advertising Update: Sales improving, revenue exceeding expense, Exhibit Hall over 75% sold out, Management Committee solicit articles for focus issues of *DFES*.
- National Food Safety Alliance.
- Joint efforts with AFDO and/or NEHA.
- Co-sponsorship of Food Micro 99, Japan PC2000, and ASAE 2000.
- Reviewed IAMFES planning goals.
- Food Safety Summit.
- IAMFES BISSC representative.
- Results of Secretary election - Anna Lammerding elected.
- Budget for year ending August 31, 2000.

Next Executive Board meeting: July 30 - August 5, 1999, Dearborn, Michigan.

The Source for Microbiological Testing Services

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- Field Sampling
- Bacterial Utilization Studies
- Disinfectant Residue Analysis
- Toxicity Studies
- Sterility Testing

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UpDates

Sara Lee Corporation Appoints Leading USDA Food Scientist to Its US Food Division

Sara Lee Corporation announced that it is bringing one of the nation's top scientists in food safety and technology into the private sector. The company has named food safety expert Ann Marie McNamara, Ph.D., as its Vice President of Food Safety and Technology. It is anticipated that Sara Lee's board of directors will appoint her a corporate Vice President at an upcoming meeting.

Dr. McNamara will report to James R. Carlson, Senior Vice President of Sara Lee Corporation and Chief Executive Officer of the company's US Foods unit. Since 1992, she has served as Director of the Microbiology Division of the US Department of Agriculture's Office of Public Health and Science in the Food Safety and Inspection Service.

Dr. McNamara has authored or co-authored numerous scientific papers on food safety, in addition to serving as a USDA Representative to President Clinton's Food Safety Initiative. She also served on the USDA committee responsible for drafting the agency's Hazard Analysis and Critical Control Point (HACCP) rules.

Prior to joining the USDA, Dr. McNamara served as a senior staff microbiologist for the National Institutes of Health Clinical Center. Her previous experience includes work at hospitals and other research organizations with an emphasis on microbial food safety programs, microbiology and other aspects of medical technology.

Dr. McNamara received a doctor of science degree in microbiology from the University of Pittsburgh Graduate School of Public Health in 1986. She served as a postdoctoral resident at the Centers for Disease Control and Prevention (CDC) in Atlanta from 1986 to 1988. In addition, she holds a master of science degree in medical technology from the University of Minnesota and a bachelor of science degree in medical technology from Quinnipiac College in Hamden, CT.

"As one of the nation's premier scientists in the areas of food safety and technology, Ann Marie McNamara will be a valued addition to Sara Lee's US Foods group," said C. Steven McMillan, President and CEO of Sara Lee Corporation. "We believe her skills and experience will be extremely beneficial to our operations."

Walter Strickland of Strickland Produce Inc., Elected Chairman of International Fresh-cut Produce Association

Walter Strickland, President of Strickland Produce, Nashville, TN was named the new Chairman of the Board of the International Fresh-cut Produce Association (IFPA) during the Association's 12th Annual Conference & Exhibition in Tampa. Strickland succeeds Chairman Leonard Batti, Vice President of Tanimura & Antle in Salinas, CA.

Strickland has close to twenty years experience in all aspects of the fresh-cut produce arena,

owning his own company, Strickland Produce, since 1981.

"Walter, who was a founding member of IFPA, has been active in the association since its inception. He is respected throughout the industry for both his business acumen and leadership abilities," Batti said. "He has excellent skills to keep our committees and staff focused on issues that most effect our members."

Four Elected to IAFIS Board

The membership of the International Association of Food Industry Suppliers (IAFIS) gathered for their 80th annual conference, and held elections to replace four expired terms on the board of directors.

Three At-Large Directors were elected, two having served previous terms, and one member is new to the board. Each will serve a 3-year term, expiring in 2002. The re-elected representatives are: Beth Kloos, President and Owner, Haynes Manufacturing Co., Westlake, Ohio; and John E. Nelson, Chairman, Nelson-Jameson, Inc., Marshfield Wisconsin. The newest Director is Virginia "Jean" Moran, President, Label Makers, Inc., Pleasant Prairie, WI.

One Ingredients Commodity Director, Bruce Poulterer, Director, International Accounts, Germantown International, West Chester, Pennsylvania, was re-elected to a 3-year term, expiring in 2002.

SRC Vision Announces New Vice President of Sales and Marketing

SRC Vision®, manufacturer of high performance machine vision systems, welcomes a new member to its management team, Rodney W. Larson as Vice President of Sales and Marketing.

Larson comes to SRC with 15 years of experience in highly competitive global businesses, most recently with FMC Corporation as General Manager of Frigoscandia Incorporated, which FMC acquired in 1996.

Prior to his responsibilities with Frigoscandia, Larson was Director of Sales and Marketing for the Packaging and Materials Handling Division of FMC, where he led marketing, sales, service and international operations for four product lines.

Larson also held engineering positions at Dow Chemical and Rogers Corporation until 1989, when he joined FMC. He holds degrees in chemistry from Arizona State, materials engineering from University of Missouri, and an MBA from Stanford School of Business.

Osmonics Establishes New Strategic Sales and Marketing Positions

Osmonics announced three promotions to new positions that will strengthen the company's strategic sales and marketing.

Lee Comb has been promoted to Vice President Engineered Products and Systems (EP&S). Comb was formerly Director of Sales for EP&S. He joined Osmonics in 1978, and has spent

the last 18 years selling custom-tailored systems into a wide range of applications around the world. Comb earned his bachelor's degree in biochemistry from the University of Minnesota.

Bjarne Nicolaisen has been promoted to Vice President International. Nicolaisen joined Osmonics with the Desal acquisition in 1996. Formerly, he was responsible for international sales and marketing, and will now have greater responsibility for these same functions in Euro/Africa, Asia/Pacific, and Latin America. Nicolaisen received his bachelor's degree in chemical engineering from Hermods-NKI University in Sweden, and his MBA from Columbia University.

Roger Miller, promoted to Vice President and Strategy, will develop corporate strategy and oversee the coordination of all marketing efforts. Miller joined Osmonics in 1993 as a Product Manager for pumps, after holding key management positions with several manufacturing concerns. Most recently he served as Manager of Marketing. Miller received his bachelor's degree in business management and industrial engineering from North Dakota State University.

Hueck Foils L.L.C. Promotes George Thibeault, Jr. to President/ CEO

Hueck Foils L.L.C., a wholly owned subsidiary of Hueck Folien GmbH has promoted George Thibeault, Jr. to President/CEO. Previously, Thibeault served as President - Sales, Service and Marketing.

Under the new organizational structure designed to provide increased flexibility, Thibeault will have responsibility for all Hueck Foils L.L.C. management issues, including marketing, service, operations, and strategic and financial direction.

Schwerin Promoted to Director of Corporate Sales and Marketing for Bell Laboratories

Bell Laboratories, Inc., an exclusive manufacturer of rodent control products, announces the promotion of John Schwerin to Director of Corporate Sales and Marketing.

Formerly marketing manager for Bell's domestic sales, Schwerin now directs the sales and marketing activities for the company in both the US and international markets. He works with the managers of Bell's various divisions developing sales within the pest control industry in the US and abroad, as well as in international agricultural and retail markets. He also manages product development and marketing in those areas.

Schwerin joined the company in 1984 as a sales representative for the eastern states and was promoted to eastern regional sales manager in 1987. A year later, as Bell's Marketing Manager, he began directing and developing its sales and marketing efforts in the US.

Schwerin holds a bachelors degree in biology and chemistry from the University of Wisconsin and served as a medical corpsman with the US Air Force before joining Bell.

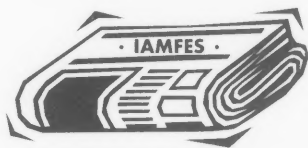
Dr. Mike Doyle to Receive NFPA Food Safety Award

Dr. Mike Doyle, Department Head, Food Science and Technology, University of Georgia, Griffin, and Director of the University's Center for Food Safety and Quality Enhancement will be the recipient of the 1999 National Food Processors Association's Food Safety Award, NFPA announced.

"Dr. Doyle has dedicated his 25-year career to food safety, and his research has been at the forefront of food industry and public health issues," said Dr. Rhona Applebaum, NFPA's Executive Vice President of Scientific and Regulatory Affairs. "Dr. Doyle was one of the first food microbiologists to study *E. coli* O157:H7, in 1982. Novel isolation procedures developed in his laboratory for *Listeria monocytogenes*, *E. coli* O157:H7, *Yersinia enterocolitica*, and *Campylobacter* spp. led the way for development of many of the testing procedures used today. His food safety expertise is recognized internationally."

The NFPA Food Safety Award is presented annually to honor an individual, group, or organization for preeminence in and outstanding contributions to the field of food safety. Nominees should demonstrate long-term involvement in the food safety arena, with achievement measured by sustained contributions in research, education and information transfer, or are responsible for the development of innovative and effective strategies to promote food safety or solutions to significant food safety problems.

The Award will be presented to Dr. Doyle at the Annual Meeting of the International Association of Milk, Food and Environmental Sanitarians (IAMFES) to be held in Dearborn, Michigan August 1-4. Dr. Doyle is a former President of IAMFES.



NEWS

"We are pleased to have Dr. Doyle receive NFPA's Food Safety Award," Dr. Applebaum stated. "Dr. Doyle was selected from an outstanding field of candidates by a panel composed of independent experts in the field of food safety. This Award is recognition by Dr. Doyle's peers of his important contributions to our nation's food safety."

USDA, NFPA Strongly Supports Use of Irradiation to Enhance Food Safety

In formal comments submitted on April 26, 1999 to the US Department of Agriculture's Food Safety and Inspection Service (FSIS), the National Food Processors Association voiced strong support for a rule to allow the use of irradiation on red meat as a food safety measure.

"NFPA has long supported the use of irradiation as a safe and effective means for eliminating or reducing microbial pathogens on food products and thereby enhancing public health," said Lloyd Hontz, NFPA's Director of Food Inspection Services. "FSIS's proposed rule, allowing the use of irradiation to enhance the safety of meat and poultry products, is

not only appropriate but is long overdue." Hontz noted that "NFPA is troubled by the four-year delay in the US government's approval of this new use of irradiation. The food additive petition that led to this proposed rulemaking was announced by the Food and Drug Administration on August 25, 1994. It is unfortunate that it took FDA nearly three and a half years to publish a final rule permitting the irradiation of red meat, and it is even more disturbing that nearly a year and a half later, this technology still is unavailable for use by the industry, due to FSIS's slowness in proposing rules governing the use of irradiation."

Hontz added that "It is also unfortunate that the limited scope of products covered by the FDA final rule and the FSIS proposal leaves this proven technology unavailable for use on a number of processed food products that could benefit from this food safety tool."

The NFPA comments also urged FSIS and FDA "to take steps to expedite this and future rulemakings dealing with irradiation and other technologies that can contribute to food safety."

Hontz noted that "NFPA stands ready to work with the agencies to remove existing roadblocks and to expand the uses of irradiation. Specifically, FDA and FSIS should eliminate the current duplicative food additive approval process by finalizing the proposed rule published December 29, 1995 so that the implementation portions of the rule will be broadly applicable to additional irradiation approvals, thereby facilitating future approvals of irradiation." Hontz pointed out that "NFPA believes that FSIS should resolve the issues raised in our 1998 petition, which requested the Agency to address and invite comments on whether special labeling requirements for irradiated foods are scientifically or legally justified, and whether such a 'radiation' disclosure requirement for meat would contribute

to consumer concern about the product's safety, thereby discouraging its use, among other labeling-related issues." Hontz noted that NFPA also supports the FSIS proposed amendment on the irradiation labeling of meat and poultry products, which would remove existing requirements that a "radura" symbol be presented in a specific color and that the irradiation statement be presented in a particular minimum type size. NFPA also objected to FSIS's proposal to require that irradiated meat and poultry ingredients must be specifically identified in further processed meats. "Other than the reduction or removal of microorganisms, irradiation produces few technical effects in irradiated meat or poultry," Hontz stated. NFPA thus believes that 'irradiated' is not an appropriate part of the common or usual name of a meat or poultry ingredient used in a further processed product.

"NFPA urges the Agency to expedite the finalization of this rule in a manner that paves the way for additional uses of irradiation to be approved in a more timely manner," Hontz concluded. "We intend to work very closely with both FSIS and FDA to obtain additional approvals that will allow the potential benefits of food irradiation finally to come to fruition."

How Bar Coding Can Aid the Food Industry

Master Group Consultants recently published five reasons why bar coding is beneficial to the food industry: The information bar codes can provide lowers the cost of raw materials by reducing waste. Dave Tietman, Lab Engineer at Yoplait Columbo USA says, "Bar coding can be used to track basically anything that goes in or out of your warehouse right down to the final product."

Tracking a product using bar codes can help identify trouble spots in the process flow. Jim Bail, Vice President of Operations and Quality at Menu Direct Corp. explains, "Let's say you pull fulfillment data from the system and it tells you that the shipper got to zone A at 10:15 with six products and left at 10:17. You can determine if processing six products in two minutes is good or not. If there are problems occurring frequently at a particular station, you can identify and solve them."

Automatically scanning a product's bar code is more dependable and saves time over manually entering the data. Assistant Plant Manager for Morningstar Foods (Madison, WI), Marty Bauman, says, "Using bar codes saves the quality control department from having to double-check items. It prevents them from getting overwhelmed by the amount of products that need to be processed. It ensures products are properly inspected and entered into the system before being shipped."

Using bar codes to license plate a product with information increases the speed at which products can be processed. Bail says, "You can access information that you wouldn't be able to in a manual distribution system. For instance, with a high-volume, high-velocity cross-docking system, you can't possibly track all the information manually. The bar codes can access and process the information at much faster speeds."

It's especially valuable in the food industry to know where a product is and where it will be in the future. In a crisis, this tool can be extremely beneficial because the bar code can create a trail of information. "A product can even be tracked all the way to a consumer's house if they purchase the item with a credit card. This would be good information to have if a safety emergency occurred with that product," says Bail.

Scientists Discuss the Risk Associated with Sudden Loss of Pesticides Due to the Implementation of the Food Quality Protection Act of 1996

The Council for Agricultural Science and Technology (CAST), an international consortium of 36 scientific and professional societies, released a report, *Agricultural Impact of the Sudden Elimination of Key Pesticides under the Food Quality Protection Act* in which a CAST task force of 11 scientists stressed that care must be exercised in FQPA implementation. The task force chaired by Dr. Mark E. Whalon, Michigan State University, East Lansing, includes individuals with expertise in agricultural economics, entomology, plant pathology, and sociology.

The FQPA charges the Environmental Protection Agency (EPA) with developing and implementing regulations to enhance protection of the US food supply from pesticide risks. A key provision of the Act calls on the EPA to evaluate pesticide residue risks based on aggregate exposure to all pesticides that share a common toxicological effect on humans. Initial moves by the EPA raised concerns the FQPA implementation might result in sudden bans on broad classes of pesticides that have been key to US farm productivity, especially productivity of most minor crops such as fruits and vegetables. The CAST report analyzes the potential impact on agricultural producers from sudden elimination of key pesticides under implementation of the FQPA.

The EPA's Office of Pesticide Programs has identified three groups of pesticides as being higher risk and, therefore, first priority in their implementation

plans for the FQPA. They include the organophosphate and carbamate insecticides and the group of broad spectrum chemicals (known as B-2 chemicals) classified as potential carcinogens that are used largely on minor crops. This group of potential carcinogens is the most commonly used fungicides. Almost all of these pesticides are used in Integrated Pest Management programs. Unlike pest management in the large-acreage agronomic crops like corn, cotton, and soybeans, current pest management in fruits, vegetables, and both human and animal health programs (such as mosquito and cockroach control programs) offers fewer alternatives to these pesticides.

The authors of the CAST report recognize and agree in principle with the goal of this statute, which is to provide a reasonable assurance of no harm from pesticides in our diet and environment. They are concerned, however, about the consequences that may arise from the hasty implementation of this statute by the EPA.

New Canadian Food Safety and Inspection Bill

The Canadian Food Inspection Agency (CFIA), in partnership with Health Canada, is proposing to consolidate and modernize the federal food and agricultural input statutes to address new and emerging issues in these areas.

The proposed new Canada Food Safety and Inspection Act consolidates five food acts (Canada Agricultural Products Act, Meat Inspection Act, Fish Inspection Act, and the food-related provisions of the Food and Drugs Act, and Consumer Packaging and Labelling Act) and the three

agricultural inputs acts (Feeds Act, Fertilizers Act and Seeds Act) into a proposed new single piece of legislation.

The Canadian Food Inspection Agency Act will be amended to include a consolidation of inspection authorities where applicable, for all acts administered by the CFIA.

The proposed new Act is enabling legislation that will provide the basis for a regulatory review. The division of responsibilities between the Minister of Agriculture and Agri-Food and the Minister of Health, establishing a system of checks and balances, as identified during creation of the Agency, remains unaltered in the proposed new legislation.

Legislative consolidation will enable the Canadian Food Inspection Agency and Health Canada to better address the changing technological environment, and to contribute to food safety, protection of consumers and market access.

The proposed new Act will also provide for a licensing regime that establishes the authority to issue licences for persons to operate establishments or for other activities related to preparing or selling agricultural and aquatic commodities or agricultural inputs. The Bill will also provide for incorporation by reference of standards established by domestic and international bodies.

Administrative and technical changes will be made to simplify and lend greater coherence to the administration of the proposed new legislation.

Finally, this proposed new legislation is designed to address emerging technologies and food safety issues, the changing needs of producers, processors and distributors and the requirements of our international trade agreements and partners.

This Bill will consolidate and modernize the legislative framework for the regulation of food, agricultural and aquatic commodities and agricultural inputs by establishing a more consistent approach in areas such as licensing, imports, offences and penalties.

The proposed new legislation will provide, among other things, the following: consolidation of all food safety provisions in one Act, with the Ministers of Health and of Agriculture and Agri-Food retaining their respective responsibilities for establishing and enforcing policies and standards for safety and nutritional quality of food; provisions to prohibit tampering, threatening to tamper or claiming falsely that food has been tampered with; a uniform legislative approach to importing food, agricultural and aquatic commodities and agricultural inputs; authority for the Minister of Health to make emergency standards to protect the public in extraordinary circumstances; authority for the Minister of Agriculture and Agri-Food to exempt persons from any provisions of the Act or regulations in the event of an emergency or natural disaster; a framework for licensing of agricultural and aquatic commodities and of agricultural inputs; The Board of Arbitration established under the Canada Agricultural Products Act, arbitrates fresh fruit and vegetable disputes. This Board's legislative authority will be continued under the Agriculture and Agri-food Administrative Monetary Penalties Act (AAAMPA), authority for the making of regulations; and a consistent approach to penalties and measures to encourage compliance.

The legislative base will be modernized by amending the Canadian Food Inspection Agency Act to make the compliance and enforcement provisions uniform

and consistent. Administrative and technical changes will be made to simplify and lend greater coherence to the administration of the legislation. Consequential amendments will be made as required to the Health of Animals Act, the Plant Protection Act and the Plant Breeders' Rights Act. The legislative authority of the Review Tribunal established under the Canada Agricultural Products Act will be continued under the Agriculture and Agri-Food Administrative Monetary Penalties Act.

Food safety continues to be the top priority. The Minister of Agriculture and Agri-Food continues to be responsible for agricultural inputs, animal and plant health and for all federal food inspection activities. The Minister of Health retains responsibility for establishing policies and standards related to the safety and nutritional value of food sold in Canada and for assessing the effectiveness of the CFIA's activities relative to food safety. Consolidation of inspection authorities into the CFIA Act will provide a consistent approach to compliance and enforcement.

The Bill will provide for a simplified regulatory framework and more efficient regulation of a complex food system. The proposed new single Canada Food Safety and Inspection Act and the consolidation of inspection authorities into the CFIA Act will not only reduce the administrative burden and enhance compliance, but will also increase the deterrents to non-compliance with food and input regulations and toughen measures to end willful repeat offences.

A consistent, modern approach to food and agricultural inputs will help in developing a common base for food legislation. This initiative involves federal, provincial,

territorial and municipal governments.

Stainless Steel Countertops Provide Best Defense against Germs in the Kitchen

A new study conducted by the Hospitality Institute of Technology and Management (HITM) revealed that stainless steel countertops are least likely to harbor dangerous bacteria, such as *E. coli*, when compared to other popular household countertop materials. The study provides important information in response to a different study released last summer by the University of Arizona at Tucson, which identified the kitchen as the most germ-contaminated area in the home. In fact, the University of Arizona study reported that countertops are one of five key "hot zones," or sites with the highest bacteria counts. While the food and restaurant industry has long relied on the health and safety benefits of steel in their kitchens, it is not a commonly used material in residential construction.

The HITM study tested stainless steel, granite, plastic laminate, wood, tile and concrete surfaces to see which could be cleaned and sanitized most effectively. Each surface was contaminated with *E. coli*, washed and rinsed with soap and water, then sanitized with a vinegar and water solution. After the sanitizing procedure, the stainless steel surface was left with the fewest number of microorganisms.

"Each countertop surface has a different capacity for resisting bacteria and easy cleaning," said O. Peter Snyder, Jr., Ph.D., who conducted the research for HITM.

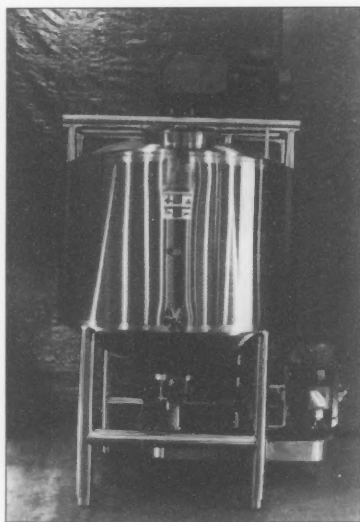
"We hope our research will help consumers make healthy decisions when selecting a countertop surface for their kitchens."

Food contamination is not the only health issue to consider when choosing a countertop surface. The fact that stainless steel can be sanitized effectively with a vinegar and water solution prevents consumers from having to repeatedly clean and sanitize countertops with chemically based disinfectants and cleaning products that can produce harmful indoor air pollutants.

Dr. Snyder says consumers should also consider the wear-and-tear factor when selecting a countertop surface. After a few years, most surfaces may wear down, lose their protective coating, scratch, and warp all decreasing the ability to be effectively cleaned and sanitized. Stainless steel, however, is an exception because it is more resistant to scratches than most surfaces, is not treated with any protective coating, and will not warp. As a result, it shows very little wear, resists bacterial adherence, and can be effectively cleaned for many years.

"Despite the health and safety benefits of incorporating stainless steel into the kitchen, many people don't consider it for countertops because they think it might look institutional or cold," said Nancy Barsotti, FASID, of the American Society of Interior Designers (ASID). "Because consumers usually choose a countertop surface based on a particular style they want to achieve in their kitchen, they should know that stainless steel can be easily incorporated into a diverse array of kitchen designs to add warmth and style."

IndustryProducts



Walker Stainless Equipment Co.

New Product Release: Walker's New Multi-Mixer™

Walker Stainless' new Multi-Mixer™ does the work of two tanks by providing high-speed, bottom mounted mixer impeller and a side and bottom sweep scraped surfaced agitator. The Multi-Mixer™ has the ability to heat, cool, mix and chop and has scrapers that prevent product burn-on. The Multi-Mixer™ is available in sizes 50 through 600 gallons.

The Multi-Mixer™ is designed for use with heavy-bodied/viscous products that require heating or cooling such as: sauces, batters, soups and soup slurries, cheese and BBQ sauces, and mixes for candy.

Walker Stainless Equipment Co., New Lisbon, WI

Reader Service No. 271

A Much Anticipated Rapid Test for *Salmonella* is Launched by BioControl

The VIP® test format, developed by BioControl Systems, is one of the most successful new food safety screening products to be introduced in the last decade. Self-contained and about the size of two postage stamps, the VIP test is easy to use and simple to read. The VIP test is used throughout the world. Previously available for the testing of *E. coli* O157:H7 and *Listeria*, the VIP test is now also available for motile and non-motile *Salmonella*.

This innovative new test for *Salmonella* offers all benefits of the VIP family – speed, accuracy, simple-to-use and innovative self-contained design. VIP for *Salmonella* is one of the fastest *Salmonella* methods available – producing results up to a full day sooner than most other rapid tests, and over two days sooner than traditional culture methods. VIP for *Salmonella* gives next-day results, including enrichment time for processed foods. Raw foods require another enrichment.

The VIP of *Salmonella* test uses a patented, proprietary reagent system that forms an antigen-antibody-chromogen complex if *Salmonella* is present. Within minutes of adding enriched sample to the sample addition well, a line appears in the test window if the sample is positive. The VIP also contains a built-in control, a second line that appears in a test verification window to signal that

the test is done. "The test device and protocol were designed specifically for users looking for speed, accuracy and convenience," Philip Feldsine, President and CEO of BioControl comments. "With the worldwide popularity of the VIP for *E. coli* O157:H7 and VIP for *Listeria*, customers have been asking for a *Salmonella* test in this format."

BioControl Systems, Inc.,
Bellevue, WA

Reader Service No. 272

Silliker's New GMP Videos Target Maintenance Personnel and Process Controls

With the significant uptick in product recalls – particularly *Listeria monocytogenes* – food manufacturers are enhancing preventive measures throughout their plants. Since contamination can occur anywhere along the production process, employee and contract supplier training is critical to implementing effective programs.

Silliker Laboratories, Inc. puts the spotlight on the full range of activities through two new employee training videos that address Good Manufacturing Processes (GMP) basics important to personnel in receiving, manufacturing, shipping and maintenance.

New titles in 1999 are: GMP Basics: Process Control Practices, this video illustrates process control practices important to

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receiving, manufacturing and shipping personnel in food plant environments. Viewers learn the importance of monitoring and controlling critical points in the manufacturing process; and GMP Basics: Guidelines for Maintenance Personnel, targeted specifically to maintenance personnel in food plant environments, the video is a dramatic presentation of a plant-wide training initiative that follows a product recall, showing how GMPs relate to daily activities. The video reinforces the fact that maintenance personnel can affect safety even if they do not routinely handle products.

These follow the well-received release of "GMP Basics: Employee Hygiene Practices" in 1998 - thousands are in distribution - which teaches employees the importance of and methods for proper hygiene and personnel practices, with an emphasis on handwashing. Workbook kits for this video are also available. Other videos produced by Silliker cover topics of HACCP and Plant Sanitation.

Silliker Laboratories Group, Inc., Homewood, IL

Reader Service No. 273

Aluminum-free Packaging Material - New Product Applications

Packaging manufacturers are in a key position between packaging board producers and end users when it comes to the introduction of new packaging solutions. End user demands have increased, particularly with respect to barrier properties. Packages are also required to be recyclable and easily disposable - a goal that cannot be achieved with conventional aluminum laminated liquid packaging.

Italpak, which produces packaging for companies in the food, cosmetics and pharmaceutical industries, has switched to using the European and USA patented Ensobarr barrier coating, which replaces aluminum laminating in packaging boards.

"Aluminum-free packaging materials are one of the future megatrends in the food industry," says Giordano Magnoni, the Managing Director of the Italian company Italpak. Italpak has focused on packaging for technically demanding products, manufacturing packaging for Johnson & Johnson, Procter & Gamble, Unilever, Henkel and L'Oréal. Customers demand that packers ensure packing material recyclability.

Italpak began a product development project in cooperation with Stora Enso Paperboards which aimed at renewing the salad dressing package manufactured for Fratelli Mantova. A vinaigrette mixture is by no means easy to pack, as it has a tendency to react with the packaging material. Previously, the inside of the package was a plastic-coated aluminum laminate. Microscopic holes appeared in the plastic coating on the aluminum, however, which meant that the vinegar began to react with the aluminum thus producing gas that causes the package to expand.

The Ensobarr coating offered a solution to this problem. It is said to provide packaging board with better oxygen and moisture barrier properties than conventional plastic-based coatings, matching the properties of aluminum laminated board. The packaging solution's barrier was further ensured by sealing the package ultrasonically. The Ensobarr barrier coating has proved its reliability in the market, where the shelf-life of the vinaigrette mixture is several months.

"Aluminum-free packaging materials were developed to meet the demands of the market and this poses an enormous challenge, especially for packaging manufacturers. In addition to technical properties and design, recyclability is currently a key factor," says Mr. Magnoni.

Thanks to its barrier properties, the Ensobarr coating can also be used in packaging for sterilized products, an area in which Italpak is a leading manufacturer. The aluminum-free barrier solution also brings packaging manufacturers cost savings.

INS, Stockholm, Sweden

Reader Service No. 274



Ryan Instruments

Monitor Four Different Temperature Locations with the New MCL from Ryan Instruments

Ryan Instruments introduces its latest in temperature monitoring devices for the quality professional with diverse and multiple temperature recording needs. Ryan Instruments delivers the Multi-Channel Logger (MCL), a four-channel temperature monitor. The MCL offers versatility and flexibility to record a range of temperatures in a variety of environments, choosing from multiple sampling rates. You'll have the power in one recording instrument you would normally

find in four. The MCL expands your temperature recording options, allowing you to more easily adapt to your ever-changing monitoring needs.

From a single device, the MCL allows you to record temperatures in four separate environments within one geographical area. Position the MCL in one area and monitor temperatures in any location. You have an option of cables in lengths of 12' (standard), 50' and 100'. The MCL can be used to monitor multi-zone temperature areas such as hot and cold display cases or single zone areas such as freezers or cold rooms.

The key to recording success – the MCL's unique Key Downloader System (KDL) allows you to collect quick data updates with no interruption in recording. Simply pull out the data key, replace it with another key, and you'll be able to analyze your data while maintaining data collection 24 hours a day, seven days a week.

Collect up to 16,000 total data samples from one sensor or up to 4,000 samples per channel for four sensors. The easy-to-use Windows software allows you to analyze your data in graphic and numeric format.

Sometimes your critical temperature points are in an out-of-view location, such as a display case or warehouse, yet you want to be able to check your products quickly and easily to be sure they are maintained within your desired temperature ranges. Using the MCL remote LED display (red/green), you can check your temperatures to see if they are in or out-of-bounds.

Ryan Instruments, Redmond, WA

Reader Service No. 275



MicroSys Inc.

BioSys Rapid *Listeria* Test Now Available from MicroSys Inc.

MicroSys Inc. has just introduced a fast, simple, and novel method for the detection of *Listeria*, using swabs and environmental sponges. *Listeria*, bacteria that can cause foodborne illness, and in some cases, even death, has recently struck several times, prompting major food companies to order recalls and review all their processes that might cause their food products to become contaminated.

With these recalls and outbreaks, it is more important than ever to adopt a rapid, cost-effective and simple method for monitoring this organism in the environment. Close monitoring of critical control points, manufacturing lines, refrigerators and freezers, as well as incoming raw material is critical to the achievement of *Listeria*-free products.

BioSys vials come pre-filled with specially-formulated media, ready for use in the BioSys instrument. Just swab the surface to be tested, add the swab to the BioSys vial, and then introduce the BioSys vial into the incubator. Once introduced into the instrument, detection will occur within 10-28

hours if *Listeria* is present. If the instrument indicates a *Listeria* sp., simply prepare a microscopic slide to observe cell morphology. If a short *Bacillus* is observed, *Listeria* is present. The liquid from the vial can be used for confirmation, if necessary, by planting on Palcam or performing another rapid method (PCR or immunoassay). This easy-to-use test can also be performed with a sponge instead of a swab.

This simple new method involves limited steps, freeing up time for the microbiologist to do other tasks. BioSys' automated monitoring system has multiple throughput capabilities, providing rapid results including location reports and statistical trend analysis of contamination.

MicroSys Inc., Ogdensburg, NY

Reader Service No. 276

Detection of Microbial Genes with Sequence Capture – PCR Method

Magnetic capture of sequence specific DNA will improve the sensitivity of PCR methods for the detection of bacterial or viral DNA in clinical samples. A 10- to 100-fold increase in sensitivity has been demonstrated using Dynabeads® M-280 Streptavidin to capture oligonucleotides prior to PCR. Dynabeads® M-280 Streptavidin are superparamagnetic microspheres with streptavidin molecules bound to their surface. Briefly, biotinylated capture oligonucleotides are added to crude extracts of tissues or cells. After hybridization between the target sequence and the capture fragment, Dynabeads® M-280 Streptavidin is added for magnetic separation. The hybrid-

ized fragment binds to the Dynabeads® M-280 Streptavidin and is isolated by placing the sample in a magnetic tube holder (Dyna® MPC). Subsequently, all irrelevant DNA and potential PCR inhibitors can be removed from the sample prior to PCR amplification. The method has been shown to detect as little as one genome of Mycobacterial bacterial DNA in 750mg of total DNA (Manglapan, G., et al JCM, May 1996).

Dynabeads® Products can also be used to isolate microorganisms from samples. ImmunoMagnetic Separation (IMS) can be used to rapidly concentrate target organisms prior to lysis and hybridization and to enrich the target organism in the small volumes usually required for PCR analysis. Dynabeads® Products can be easily coated with antibodies specific to your target organism. Dynabeads® Products are also available pre-coated with antibodies to *Salmonella*, *Listeria*, and *E. coli* O157.

Dynal, Inc., Lake Success, NY

Reader Service No. 277

Promega Offers Products to Aid in the Detection of Modified Genetic Material in Foods

Promega provides a full line of DNA extraction and purification reagents and kits that can aid in testing foods for the presence of genetically modified material (GMO – Genetically Modified Organisms). Promega's Wizard®

Resin and Wizard® Genomic Purification Kits yield highly pure DNA, ideal for GMO testing.

The DNA isolation procedures described in the European standard, *Screening method for the identification of genetically modified organisms (GMO) in food*, result in purified DNA which is suitable for PCR analysis. Use of Wizard® resin eliminates the need for organic extraction. The Promega technical literature also includes a simple and effective protocol for extraction of DNA from plant tissue using the Wizard® Genomic Purification System.

In addition to the Wizard® products, Promega offers PCR systems and other reagents such as Proteinase K and restriction enzymes which can be used with this European standard method which has been published by the Joint Research Centre of the European Commission.

Promega Corporation,
Madison, WI

Reader Service No. 278

Chlorinated, Alkaline Detergent Effectively Controls Broken-Egg Foam in Food Processing Plants

Oakite® 167 Plus, a single-package material specifically formulated for egg washing, solves foam problems produced by broken egg contamination in cleaning solutions.

Special defoamants in the chlorinated, alkaline powder effectively keep foam down for

trouble-free operation by continuously removing tenacious protein soils and stubborn stains from eggshells. The detergent is particularly suited for high volume automated egg-washing equipment, including brush- and spray-washing machines. Oakite 167 Plus also finds application for cleaning stainless steel equipment in food plants.

Used at economically dilute concentrations, the free-flowing powder is readily soluble, performs effectively in hard water, and rinses freely and thoroughly. Oakite 167 Plus is authorized by the USDA in federally inspected meat plants for Code A1 applications and in poultry plants for Code Q1 (shell egg cleaning) and Code Q2 (shell egg destaining) applications.

Oakite Products, Inc., with headquarters based in Berkeley Heights, New Jersey, has been developing, manufacturing and supplying state-of-the-art specialty chemical products since 1909. The QS9000/ISO 9001 certified company offers a wide spectrum of products ranging from cleaners, sanitizers, chain lubes, additives, and defoamants to complete available water and waste treatment programs. Oakite's integrated products, chemical management systems, process equipment, and service programs facilitate the achievement of many industries' processing needs.

Oakite Products, Inc., Berkeley Heights, NJ

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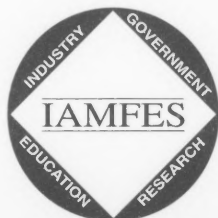
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Executive Director

DAVID W. THARP

To All IAMFES Members:

Today I'm writing to encourage your involvement in IAMFES, specifically in our Committees, Professional Development Groups (PDGs), Task Forces, and Support Groups. Each of these groups serves a vital function in the organization of IAMFES and your expertise is welcome and needed! If you have participated with our Committees, PDGs, Task Forces, or Support Groups (herein referred to as Committees) in the past, I commend you for your service and challenge you to continue.

IAMFES Committees meet during the IAMFES Annual Meeting and may meet throughout the year via conference call or E-mail. Even if you are not able to attend the IAMFES Annual Meeting, your involvement with a Committee is still possible. Please review the listing of Committees on the following page to find a group that your interest and knowledge can benefit. Call the Chairperson listed to learn more about the function of the group; then, if it sounds interesting, volunteer your time to help benefit other professionals.

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 IAMFES Members. We all have a responsibility to help others grow and learn. What a better way than to become involved and help your colleagues.

I'm looking forward to seeing your name on our next Committee listing!
Thank you in advance.

Sincerely,

Jenny Scott
Vice President, IAMFES

IAMFES' mission: "To provide food safety professionals worldwide with a forum to exchange information on protecting the food supply"

IAMFES

Committee Chairpersons

Professional Development Groups, Task Forces, and Support Groups

STANDING COMMITTEES

Standing committees provide operational or functional support to IAMFES and consist of the following:

Dairy, Food and Environmental Sanitation Management Committee

O. D. (Pete) Cook
Phone: 301.443.1240 Fax: 301.443.3757
E-mail: pcook@ora.fda.gov

Journal of Food Protection Management Committee

Anna M. Lammerding
Phone: 519.822.3300 ext.247 Fax: 519.822.2280
E-mail: anna_lammerding@hc-sc.gc.ca

Past Presidents' Advisory Committee

Gale Prince
Phone: 513.762.4209 Fax: 513.762.4372
E-mail: gprince@kroger.com

Program Committee

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

SPECIAL COMMITTEES

Special Committees provide support services to IAMFES on a continuous basis. Special Committees of IAMFES consist of the following:

Committee on Communicable Diseases Affecting Man

Frank L. Bryan
Phone: 770.760.1569

Committee on Sanitary Procedures

Dan Erickson
Phone: 612.297.2134 Fax: 612.297.5176
E-mail: daniel.erickson@state.mn.us

Nominating Committee

F. Ann Draughon
Phone: 423.974.7425 Fax: 423.974.7332
E-mail: draughon@utk.edu

Teller Committee

F. Ann Draughon
Phone: 423.974.7425 Fax: 423.974.7332
E-mail: draughon@utk.edu

PROFESSIONAL DEVELOPMENT GROUPS

Professional Development Groups (PDGs) are established by the Executive Board at the request of a group of Members to promote professional development in specific disciplines or areas of interest, which further the Association's goals.

Applied Laboratory Methods

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

Audiovisual Library

Thomas M. Gilmore
Phone: 703.761.2600 Fax: 703.761.4334
E-mail: tgilmore@iafis.org

Dairy Quality and Safety

Gaylord B. Smith
Phone: 518.370.0288

Food Safety Network

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

Food Sanitation

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

Fruit and Vegetable Safety and Quality

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

Donald E. Conner
Phone: 334.844.2639 Fax: 334.844.2641
E-mail: dconner@acesag.auburn.edu

Microbial Food Safety Risk Assessment

Lee-Ann Jaykus
Phone: 919.513.2074 Fax: 919.515.7124
E-mail: leeann_jaykus@ncsu.edu

Retail Food Safety and Quality

O. Peter Snyder
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E-mail: osnyder@hi-tm.com

Seafood Safety and Quality

Carlos Abeyta
Phone: 425.483.4870 Fax: 425.483.4996

Viral and Parasitic Foodborne Disease

Daniel J. Maxson
Phone: 702.383.1263 Fax: 702.383.1445

TASK FORCES

Task Forces may be authorized by the Executive Board for special work or assignment that can normally be accomplished within two years. The need for continuation of such Task Forces shall be subject to annual review of the Executive Board.

Awards

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In Memory of...

*Mark Nelson
Neenah, Wisconsin*

IAMFES would like to extend our deepest sympathy to the family and friends of Mark Nelson who recently passed away.

ANNA M. LAMMERDING ELECTED IAMFES SECRETARY

IAMFES is pleased to announce that Anna M. Lammerding, Ph.D. has been elected by the IAMFES Membership as the new IAMFES Executive Board Secretary. Anna is Chief of the Microbial Food Safety Risk Assessment Unit, Health Protection Branch, Health Canada, in Guelph, Ontario. She is an Associate Member of the Faculty of Graduate Studies at the University of Guelph and was recently elected to the International Commission on Microbiological Specifications for Foods.

In 1998, Anna was the recipient of the Harry Haverland Citation Award for her contributions to IAMFES. She has been an active IAMFES Member since 1986. Her involvement includes serving on the Editorial Board for the *Journal of Food Protection*, conducting a workshop on Microbial Risk Assessment, organizing symposia for six



IAMFES Annual Meetings, and arranging sponsorship for the symposia. Anna has also served on several committees including the Nominating Committee, the Program Committee, and as Chairperson of the *JFP* Management Committee. She organized the Microbial Food Safety Risk Assessment Professional Development Group (PDG), was Chairperson of the Meat Safety and Quality PDG and the Developing Scientist Awards Committee, and served on the Educator Award Selection Committee.

In 1997, Dr. Lammerding received the Lifetime Achievement Award from the Ontario Food Protection Association (OFPA). She served as President of OFPA in 1994, was Program Chairperson for several OFPA Annual Meetings and a member of the Local Arrangements Committee for the 1992 IAMFES Annual Meeting in Toronto.

Dr. Lammerding received her Ph.D. at the Food Research Institute in Madison, Wisconsin and received her BS and MS from the University of Guelph. She has authored or co-authored over 30 publications on food safety. During her career, Dr. Lammerding has been invited to speak and serve as a representative to many international organizations including the International Dairy Federation, the World Congress on Meat and Poultry Inspection, the World Health Organization and the Food and Agriculture Organization.

FOOD MICRO '99

Ecology and physiology of food related microorganisms

Veldhoven, The Netherlands, 13 - 17 September, 1999

SCIENTIFIC PROGRAMME

General ecology and physiology

general physiology
stress responses and virulence
cleaning and disinfection
microbiology of food ecosystems
probiotics

Preservation

physiology of spoilage organisms
new preservation technology
and agents
fermentation

Risk based safety approaches

risk analysis
safety of novel foods
resistance, virulence and pathogenicity
emerging pathogens
methods for detecting pathogens
mycology and mycotoxins

FOOD MICRO '99 is designed to be a meeting place for those working in food microbiological research and those who are studying food microbiology as well as for professionals responsible for the production of safe food and authorities involved in safe food regulations. Each session will be preceded by a keynote lecture.

For information, registration, etc. please contact Congress Service Brabant either by fax + 31 40 2546566 or E-mail: KSB@koningshof.nl. Information about Food Micro '99 is also available on internet: www.cbs.knaw.nl/foodmicro

Food Micro '99 is co-sponsored by the International Association of Milk, Food and Environmental Sanitarians.

IAMFES Committee Meetings

**Sunday, August 1, 1999
Hyatt Regency Dearborn
Dearborn, Michigan**

Affiliate Council, <i>Stanley Steamer Suite</i>	7:00 a.m. - 10:00 a.m.
Applied Laboratory Methods, <i>Royce Suite</i>	10:00 a.m. - 12:00 p.m.
Audiovisual Library, <i>Knight Suite</i>	10:00 a.m. - 12:00 p.m.
Awards, <i>Stanley Steamer Suite</i>	10:30 a.m. - 12:00 p.m.
Communicable Diseases Affecting Man, <i>Royale Suite</i>	10:00 a.m. - 5:00 p.m.
Constitution and Bylaws, <i>Pierce Suite</i>	10:00 a.m. - 12:00 p.m.
Dairy Quality and Safety, <i>Bugatti Suite</i>	1:30 p.m. - 3:30 p.m.
DFES Management, <i>Stanley Steamer Suite</i>	1:30 p.m. - 3:00 p.m.
Education, <i>Stearns Suite</i>	1:30 p.m. - 3:30 p.m.
Food Safety Network, <i>Stearns Suite</i>	10:00 a.m. - 12:00 p.m.
Food Sanitation, <i>Royce Suite</i>	1:30 p.m. - 3:00 p.m.
Foundation Fund, <i>Knight Suite</i>	1:30 p.m. - 3:00 p.m.
Fruit and Vegetable Safety and Quality, <i>Arrow Suite</i>	1:30 p.m. - 3:30 p.m.
HACCP Task Force, <i>Thomas Suite</i>	3:30 p.m. - 5:00 p.m.
JFP Management, <i>Stanley Steamer Suite</i>	3:00 p.m. - 4:30 p.m.
Meat and Poultry Safety and Quality, <i>Thomas Suite</i>	1:30 p.m. - 3:30 p.m.
Microbial Food Safety Risk Assessment, <i>Thomas Suite</i>	10:00 a.m. - 12:00 p.m.
Nominating, <i>Knight Suite</i>	3:00 p.m. - 4:30 p.m.
Past Presidents' Advisory, <i>Royce Suite</i>	3:00 p.m. - 4:00 p.m.
Program, <i>Stanley Steamer Suite</i>	4:30 p.m. - 5:30 p.m.
Retail Food Safety and Quality, <i>Bugatti Suite</i>	10:00 a.m. - 12:00 p.m.
Sanitary Procedures, <i>Arrow Suite</i>	10:00 a.m. - 12:00 p.m.
Seafood Safety and Quality, <i>Pierce Suite</i>	1:30 p.m. - 3:30 p.m.
Viral and Parasitic Foodborne Disease, <i>Pierce Suite</i>	3:30 p.m. - 5:00 p.m.



Lecturer: Dr. Fritz Käferstein, FDA/USDA, Joint Institute for Food Safety and Applied Nutrition at the University of Maryland, College Park, Maryland.

Ivan Parkin Lecture
Global Food Safety in the 21st Century

Sunday, August 1, 1999

Opening Session — 7:00 p.m.

In 1986, IAMFES established the Ivan Parkin Lecture to honor Ivan Parkin, a Dairy Extension Specialist at Pennsylvania State University. Dr. Parkin was IAMFES President from 1954 to 1955 and remained active in the association for many years following.

He served as an example to others as a loyal Member, a professional, an educator dedicated to protecting the food supply, and is remembered by those who knew him as a kind and warm person.

The Ivan Parkin Lecture is to honor those individuals who have had a significant impact on the field of food safety. This year, Dr. Fritz Käferstein, FDA/USDA, Joint Institute for Food Safety and Applied Nutrition at the University of Maryland will deliver the lecture. Dr. Käferstein received his veterinary degree in 1962 from the University of Giessen, after studying at the veterinary schools in Giessen and Berlin (West), Germany. He obtained his doctorate of veterinary medicine in 1964 for a thesis on the identification and significance of the presence of antibiotic residues in meat. At that time he worked as Research Assistant at the Veterinary Faculty of the University of Giessen.

Dr. Käferstein worked for the New Zealand Department of Agriculture as a Supervising Veterinarian in the meat industry from 1968 to 1972. He joined the German Federal Health Office, first as Chief of the Food Safety Unit in the Robert-von-Ostertag-Institut and later as Director and Professor of the Center for Monitoring and Health Evaluation of Environmental Chemicals in Food. Dr. Käferstein also directed the WHO Collaborating Center for Food Contamination Monitoring and collaborated closely with various groups in WHO. In 1980, WHO established the Food Safety Program and he was appointed as the Program Manager. Dr. Käferstein retired as Director of the Program on Food Safety and Food Aid with WHO in July 1998. Dr. Käferstein began with the FDA/USDA, Joint Institute for Food Safety and Applied Nutrition at the University of Maryland, College Park, Maryland in November 1998 as Distinguished Visiting Scientist.

**Visit our Web site
at www.iamfes.org**

Awards

for the 1999 IAMFES Annual Meeting

Black Pearl: Caravelle Foods

Honorary Life Membership: Sidney E. Barnard, Michael H. Brodsky,
Charles Felix, and James L. Smith

Fellows: Richard A. Brazis, Michael H. Brodsky, James M. Jay,
Robert T. Marshall, Lawrence A. Roth, and Earl O. Wright

Harry Haverland Citation: John C. Bruhn

Educator: Eric Johnson

Sanitarian: Gloria I. Swick

Harold Barnum Industry: Russell Flowers

NFPA Food Safety: Michael P. Doyle

1999 Affiliate Awards

C.B. Shogren Memorial: Wisconsin Association of Milk and Food Sanitarians

Best Affiliate Communication Materials: Wyoming Environmental Health Association

Best Affiliate Annual Meeting: Iowa Association of Milk, Food and Environmental Sanitarians, Inc.

Best Affiliate Educational Conference: Associated Illinois Milk,
Food and Environmental Sanitarians

Preliminary Program of the IAMFES 86th Annual Meeting

SUNDAY EVENING — AUGUST 1, 1999

Opening Session

- Welcome Comments
- Presentation of the IAMFES Fellows Awards
- Ivan Parkin Lecture — "Global Food Safety in the 21st Century" presented by Dr. Fritz Käferstein, FDA/USDA, Joint Institute for Food Safety and Applied Nutrition at the University of Maryland, College Park, Maryland.

Cheese and Wine Reception will follow in the Exhibit Hall.

MONDAY MORNING — AUGUST 2, 1999

S1 Science-based Criteria for Harmonizing Food Safety Regulations

(Sponsored by ILSI-N.A.)

Dearborn Ballroom

Co-Convenors: J. Stanley Bailey and Paul A. Hall

- 8:30 • Welcoming Remarks — ALEX MALASPINA, ILSI, Washington, D.C., USA
- 8:40 • Scientific Basis for Setting Performance Standards — JEAN-LOUIS JOUVE, European Commission, Brussels, Belgium
- 9:10 • Harmonization of *Listeria* Tolerance Limits — The European Experience — PAUL TEUFEL, Institute for Hygiene and Food Safety, Kiel, Germany
- 9:40 • Harmonization of Acceptance Criteria for Microbiological Methods — RUSSELL S. FLOWERS, Silliker Laboratories Group, Inc., Chicago, IL, USA
- 10:10 • Break — *Coffee, Pastries, and Dairy Products available in the Exhibit Hall*
- 10:30 • Equivalence of Food Safety Systems: An Emerging Concept in the International Trade of Foods — CATHERINE W. CARNEVALE, FDA, Washington, D.C., USA
- 11:00 • Why Microbiological Criteria for Enterohemorrhagic *Escherichia coli* and Not Shiga Toxin-producing *E. coli* in Foods? — MICHAEL P. DOYLE, University of Georgia, Griffin, GA, USA
- 11:30 • Panel Discussion

S2 Fruits and Vegetables: Are They Safe Enough?

Springwells Ballroom

Co-Convenors: Frank Yiannas and Ewen Todd

- 8:30 • Outbreaks Associated with Produce — MORRIS E. POTTER, CDC, Atlanta, GA, USA
- 9:00 • Risk Management Strategies at the Farm — NANCY NAGLE, Nagle Resources, Pleasanton, CA, USA
- 9:30 • Assuring the Safety of Unpasteurized Juices — ROBERT BUCHANAN, FDA, Washington, D.C., USA
- 10:00 • Break
- 10:30 • Interventions to Reduce the Risk of Pathogens Associated with Alfalfa Sprouts — LARRY BEUCHAT, University of Georgia, Griffin, GA, USA
- 11:00 • Quantitative Risk Assessment of *E. coli* O157 and *L. monocytogenes* in Fresh-cut Produce — EWEN TODD, Health Canada, Ottawa, Ontario, Canada
- 11:30 • Microbiological Issues Associated with Packaged Produce — E. JEFFREY RHODEHAMEL, Cryovac North America, Duncan, SC, USA

S3 Mini Workshop for Dairy Plant Employees and Regulators

Regency B-C

Convenor: Tom Gilmore

- 8:30 • Plant Regulatory Inspection — CHARLES PRICE, SR., FDA, Chicago, IL, USA
- 8:50 • Employee G.M.P.'s — GAYLORD SMITH, Mohawk Assoc., Inc., Schenectady, NY, USA
- 9:10 • Standards Pertaining to Product Quality, Part 1 — RUTH FUQUA, Quality Creek Dairies, Inc., Mt. Juliet, TN, USA
- 10:00 • Break — *Coffee, Pastries, and Dairy Products available in the Exhibit Hall*
- 10:30 • Sanitary Design & Installation of Equipment — DON GRAHAM, Graham Sanitary Design Consulting, Chesterfield, MO, USA
- 11:00 • Standards Pertaining to Product Quality, Part 2 — RUTH FUQUA, Quality Creek Dairies, Inc., Mt. Juliet, TN, USA

**Microbiology of Meat and Poultry –
Technical Session**

Regency E-K

Co-Convenors: Randy Phebus and Peter Bodnaruk

- 8:30 • Reduction of *E. coli* O157:H7 Concentrations
T1 in Ruminant Contents In Vitro; Bacteriocidal
Effect of Sodium Chlorate – DAVID J. NISBET,
R. C. Anderson, S. A. Buckely, R. B. Harvey,
and L. H. Stanker, USDA, ARS, College Station,
TX, USA
- 8:45 • Incidence of *E. coli* O157:H7 in Frozen Beef
T2 Patties Produced Over an Eight Hour Shift –
W. PAYTON PRUETT, JR., T. Biela, R. S.
Flowers, P. Mrozinski, C. Lattauada, B. Rose,
A. M. McNamara, J. O. Reagan, D. Theno, and
W. Osborne, Silliker Laboratories Group, Inc.,
Homewood, IL, USA
- 9:00 • Commercial Evaluation of Multiple-Sequential
T3 Interventions for Decontamination of Beef
Carcasses – R. TODD BACON, J. N. Sofos,
K. E. Belk, J. O. Reagan, and G. C. Smith,
Colorado State University, Fort Collins, CO,
USA
- 9:15 • Verification of the Effectiveness of a Second
T4 Generation Steam Pasteurization™ System
for Decontaminating Pre-rigor Beef Carcass
Sides in a Commercial Slaughter Facility –
D. D. RETZLAFF, R. K. Phebus, S. B. Sporing,
M. D. Schafer, and S. A. Rueger, Kansas State
University, Manhattan, KS, USA
- 9:30 • Effectiveness of Potassium Lactate and Lactic
T5 Acid against *Campylobacter* on Chicken
Breasts – DAVID D. RASMUSSEN, S. S. Sumner,
C. R. Hackney, J. E. Eifert, M. L. Eckhoff,
and B. T. deVegt, Virginia Tech, Food Science
and Technology, Blacksburg, VA, USA
- 9:45 • Chlorination of Chill Tanks Reduces
T6 Salmonellae on Processed Broiler Carcasses –
J. STAN BAILEY, N. A. Cox, and N. J. Stern,
USDA, Athens, GA, USA
- 10:00 • Break – *Coffee, Pastries, and Dairy Products*
available in the Exhibit Hall
- 10:30 • Cross-contamination Model for *Salmonella*
T7 in Poultry Chilling Process – HONG YANG,
Y. Li, and M. G. Johnson, University of
Arkansas, Fayetteville, AR, USA
- 10:45 • A Computer Software Application of Assessing
T8 the Risk and Severity of *Salmonella* and
Campylobacter Infections from Poultry
Products – THOMAS P. OSCAR, USDA, ARS,
Princess Anne, MD, USA
- 11:00 • Changes in the Native Microflora, Weight,
T9 and pH of the Ceca of Turkeys Subjected
to Feed Withdrawal – ARTHUR HINTON, JR.,
R. J. Buhr, and K. D. Ingram, PPMQ, ARS,
USDA, Athens, GA, USA

- 11:15 • Use of Whey-based Film Containing Anti-
T10 microbial Agents to Inhibit *L. monocytogenes*
in Frankfurters – CRYSTAL R. MCDADE,
S. M. Zutara, E. Ryser, C. W. Donnelly, and
H. Chen, University of Vermont, Burlington,
VT, USA
- 11:30 • Levels of Microbiological Contamination of
T11 Pork Carcasses during Slaughter – HENRY
N. ZERBY, K. E. Belk, M. Hardin, J. N. Sofos,
and G. C. Smith, Colorado State University,
Fort Collins, CO, USA
- 11:45 • Extent of Microbiological Contamination
T12 on Pork Variety Meats – HENRY N. ZERBY,
K. E. Belk, M. Hardin, W. Lloyd, J. N. Sofos,
and G. C. Smith, Colorado State University,
Fort Collins, CO, USA

**Rapid Methods and Miscellaneous –
Poster Session**

Great Lakes Center – Exhibit Hall

**Co-Convenors: Robert Williams
and Charity Lakins**

(10:00 a.m. – 1:00 p.m.)

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

- P1 • Modification of Some Selective Media for
the Rapid Detection of *Salmonella* Using
Impedance-splitting Method – PRAVATE
TUITEMWONG, T. Hongdusit, and
K. Tuitemwong, King Mongkut's University
of Technology Thonburi, Bangkok, Thailand
- P2 • Use of Membrane Fraction and Selective
Motility for the Rapid Screening of *L. mono-*
cytogenes – PRAVATE TUITEMWONG,
J. Wongchavalit, and K. Tuitemwong, King
Mongkut's University of Technology Thonburi,
Bangkok, Thailand
- P3 • Evaluation of the BAX for Screening/Genus
Listeria Method for Testing Environmental
Sponges – JOSEPH D. MEYER, K. B. Mikkelsen-
Baldus, A. C. Borger, W. M. Barbour, and P. A.
Hall, Kraft Foods, Oscar Mayer Division,
Madison, WI, USA
- P4 • Immunoassay-based Test for Detection of
Peanuts in Food Products – MOHAMED M.
ABOUZIED, S. A. Askegard, P. S. Satoh,
S. L. Hefle, J. A. Nordlee, and S. L. Taylor,
Neogen Corporation, Lansing, MI, USA
- P5 • Detection of Egg Contamination in Food
Products by Immunoassay-based Test –
MOHAMED M. ABOUZIED, C. J. Fetznier,
P. S. Satoh, S. L. Hefle, E. Jeanniton, and
S. Taylor, Neogen Corporation, Lansing, MI,
USA
- P6 • Accuracy of *Salmonella* Detection in Food
Using Commercially Available *Salmonella*
ELISA tests – CATHERINE SMITH, K.W.
Doherty, and C.-M. Chen, Idexx Laboratories,
Westbrook, ME, USA

- P7 • Rapid Preparation of PCR Samples from Food Combined with Shortened PCR Cycles for the Detection of *E. coli* – WILLIAM K. SHAW, JR., and L. A. McLandsborough, University of Massachusetts, Amherst, MA, USA
- P8 • Enumeration of *Campylobacter jejuni* and *C. coli* within 36 h by Immunoblotting from Modified Blood Agar Medium – RAMA NANNAPANENI, R. Story, and M. G. Johnson, University of Arkansas, Dept. of Food Science, Fayetteville, AR, USA
- P9 • A Single Medium for the Quantitative Screening of Three Foodborne Pathogens – R. VICTOR LACHICA, U.S. Army Natick Labs, Natick, MA, USA
- P10 • Comparison of Microbial Identification Methods – MARLENE CELIS, J. Deabel, V. Gangar, and M. Curiale, Silliker Laboratories Research Corp. Center, South Holland, IL, USA
- P11 • A PCR-ELISA for Detecting Shiga Toxin-producing *E. coli* in Food – BEILEI GE, J. Meng, and S. Zhao, University of Maryland, College Park, MD, USA
- P12 • Evaluation of the TECRA® Unique™ Test for Rapid Detection of *Salmonella* in Food: A Collaborative Study – DENISE HUGHES, A. Dailianis, and L. Hill, TECRA Diagnostics, Roseville, Australia
- P13 • Rapid 24 H Multiplex Detection of Four Pathogens in Food from a Single Enrichment – ANNE DAVIES, R. Owen, D. Nelson, B. Wicks, L. Parsons, C. Hamill, R. Mackee, and B. Thomas, Celsis, Inc., Evanston, IL, USA
- P14 • Rappaport-Vassiliadis Enrichment Procedure for Use with DNA Hybridization Assays for Detection of *Salmonella* spp. in Foods – MARK A. MOZOLA and G. W. Durbin, GENE-TRAK Systems, Hopkinton, MA, USA
- P15 • Differentiation between Types and Strains of *Clostridium botulinum* by Riboprinting – GUY E. SKINNER, G. A. Fingerhut, S. M. Gendel, and H. M. Solomon, USFDA/NCFST, Summit-Argo, IL, USA
- P16 • Evaluation of Clearview™ and Bax™ for the Detection of *Listeria* sp. and *L. monocytogenes* – MARIA T. DESTRO and D. A. Rodrigues, FCF/USP, Sao Paulo, SP, Brazil
- P17 • Comparison of Different Dye Indicators for Early Detection of Microbial Growth – *E. coli* O157:H7 Using Biosys 32 – ADALGISA M. MORA, S. L. Archie, N. E. Allen, and A. P. Dessai, Tuskegee University, Tuskegee, AL, USA
- P18 • The Influence of Pre-enrichment Media on the Detection of *E. coli* O157:H7 with a Fluorogenic DNA-based Assay – ROBERT L. GREEN, M. Matsuura, L. A. Yagi, and P. A. Foxall, PE Biosystems, Foster City, CA, USA
- P19 • Comparison of BAX® and Organon Teknika® *Salmonella*-Tek to Standard Selective Enrichment Method for the Detection of *Salmonella* in Food – THEODORA MORILLE-HINDS, H. Trenk, and P. A. Hall, Kraft Foods, Tarrytown, NY, USA
- P20 • Isolation of Foodborne *Salmonella* Using Dynabeads® Anti-*Salmonella* and Oxoid S.P.R.I.N.T. *Salmonella* Medium – KOFITSYO S. CUDJOE, R. Krona, M. Ron, and A. Campbell, Dynal AS, Norwegian College of Vet. Medicine, Oslo, Norway
- P21 • Collaborative Testing of a Prototype Automated IMS System for Rapid Detection of *Salmonella* and *E. coli* O157 Using Dynabeads® – KOFITSYO S. CUDJOE, R. Krona, M. Ron, and A. Campbell, Dynal AS, Norwegian College of Vet Med., Oslo, Norway
- P22 • The Use of Rapid Methods to Assess the Incidence and Public Health Risk of *S. aureus* in Food and Food Production Environments – JILL GEBLER, Murray Goulburn Co-operative Co. Ltd., Victoria, Australia
- P23 • Evaluation of the Rapid SimPlate™ Yeast and Mold Test for Various Food Bar Products – Y. JENNIFER LEE, S. D. Allard, and D. J. Yonker, Amway Corporation, Ada, MI, USA
- P24 • Comparison of Two ELISA Tests against Standard Method for the Detection of *Listeria* Species in Food Samples – HAOYI GU, K. Osborne, and C. M. Chen, Idexx Laboratories, Inc., Westbrook, ME, USA
- P25 • *Salmonella* Detection in Food: Study of a Two-step Enrichment Protocol Combined with an ELISA – PATRICE ARBAULT and S. Pomerol, Diffchamb S.A., Lyon, France
- P26 • Cleaning Validation in Food Retail Environments by a New Protein Assay – BRIAN ECKENROTH and E. Ehrenfeld, IDEXX Laboratories, Westbrook, ME, USA
- P27 • A Comparative Media Analysis of Newspaper Coverage of Microbial Food Safety Issues in Canada, the US, the UK and Australia, 1994-1998 – AMANDA WHITFIELD, K. Vandenberg, J. Seib, S. Grant, and D. A. Powell, University of Guelph, Guelph, Ontario, Canada
- P28 • Statistical Process Monitoring and Fault Diagnosis in a Continuous Dairy Pasteurization Process – F. KOSEBALABAN, J. E. Schlessler, and A. Cinar, Illinois Institute of Technology, Chicago, IL, USA

- P29 • Cleaning Validation of Food Processing Equipment: A Comparison between a New Ultrasonic Apparatus and Swab Method – NADIA OULAHAL-LAGSIR, A. Martial, E. Marquis-Boistier, and M. Bonneau, Raliment: Rhone Alpes Food Research Center, France
- P30 • A Comparative Evaluation of the Cleaning Performances of a Range of Seven Floors in Food Industry – NADIA OULAHAL-LAGSIR, E. Marquis-Boistier, and J. P. Larpent, Raliment/Alimentec Recherche, Hygiene and Quality, France
- P31 • Indicative Microbes on Processed Shrimp before Implementation of US FDA's HACCP Regulations – CUSTY F. FERNANDES, C. D. Veal, D. L. Marshall, and K. R. Cadwallader, Mississippi State University, Pascagoula, MS, USA
- P32 • Evaluation of HACCP Program for Deli Food Service Managers – JULIE A. ALBRECHT, D. L. Peters, and S. S. Sumner, University of Nebraska, Lincoln, NE, USA

MONDAY AFTERNOON – AUGUST 2, 1999

S4 Globalization of Foodborne Disease

Dearborn Ballroom

Co-Convenors: Ewen Todd and Trish Desmarchelier

- 1:30 • Types of Foodborne Outbreaks in Developing Countries – EWEN TODD, Health Canada, Ottawa, Ontario, Canada
- 2:00 • The Prevention of Spread of Foodborne Disease from a WHO Perspective – YASMINE MOTARJEMI, WHO, Geneva, Switzerland
- 2:30 • The Americas – ELLEN MORRISON, FDA, Washington, D.C., USA
- 3:00 • Break – *Coffee and Dairy Products available in the Exhibit Hall*
- 3:30 • Trade with and within Europe – To be announced
- 4:00 • Japan – HIROSHI TAKAHASHI, Washington State Dept. of Health, Shoreline, WA
- 4:30 • Australia and New Zealand – TRISH DESMARCHELIER, CSIRO, Tingalpa, Queensland, Australia

S5 Manure and Water: Produce Safety Implications

(Sponsored by the IAMFES Foundation Fund)

Springwells Ballroom

Co-Convenors: Jeff Farber and Linda Harris

- 1:30 • Water and Manure Safety Issues for the Next Millennium – DEAN O. CLIVER, University of California-Davis, Davis, CA, USA

- 2:00 • Water Quality and Safety – JOAN ROSE, University of South Florida, St. Petersburg, FL, USA
- 2:30 • Developing Manure Management Controls for Conventional and Organic Farming – TREVOR SUSLOW, University of California-Davis, Davis, CA, USA
- 3:00 • Break – *Coffee and Dairy Products available in the Exhibit Hall*
- 3:30 • Field Sanitation/Worker Hygiene Issues – FRANCES PABRUA, California Strawberry Commission, Watsonville, CA, USA
- 4:00 • FDA Voluntary Good Agricultural Practices – MICHELLE SMITH, FDA, Washington, D.C., USA
- 4:30 • Panel Discussion

S6 Dairy Plant Quality and Safety Programs *Regency A-C*

Convenor: Gary Trimmer

- 1:30 • Preventive Maintenance in Dairy Plants – CHRIS NEWCOMER, New-Tech Consulting, Inc., Cincinnati, OH, USA
- 2:00 • Dairy Plant Perspective on FDA HACCP Pilot Program – DEAN SOMMER, Alto Cheese, Waupun, WI, USA
- 2:30 • Implementing a HACCP Program – JEFF MAIATICO, DFA, New Wilmington, PA, USA
- 3:00 • Break – *Coffee and Dairy Products available in the Exhibit Hall*
- 3:30 • Designing a HACCP Plan – RANDY DOUGHERTY, National Sanitation Foundation, Ann Arbor, MI, USA
- 4:00 • Report from the NCIMS HACCP Committee – CLANDIA COLES, Washington State DPA, Olympia, WA, USA
- 4:30 • Dairy Plant Prerequisites – STEVE SIMS, M.S.B., Washington, D.C., USA

General Food Microbiology – Technical Session *Regency E-K*

Co-Convenors: Donald Schaffner and Ann Draughon

- 1:30 • Modeling the Growth Boundary of *Staphylococcus aureus* for Risk Assessment Purposes – CYNTHIA M. STEWART, M. B. Cole, J. David Legan, D. Schaffner, L. Slade, and M. Vandeven, Nabisco Inc., E. Hanover, NJ, USA
- 1:45 • Response Surface Models for Effects of Previous Sodium Chloride and Temperature on Growth Kinetics of *Salmonella typhimurium* on Cooked Chicken Breast – THOMAS P. OSCAR, USDA, ARS, Princess Anne, MD, USA

- 2:00 • Bacteriophage Activity against *E. coli* O157:H7
T15 and *Salmonella* spp. – ANANTA P. DESSAI,
L. R. Chery, and S. L. Archie, Tuskegee
University, Tuskegee, AL, USA
- 2:15 • Effect of Chlorine Treatment on Heat
T16 Inactivation of *E. coli* O157:H7 – JAMES
P. FOLSOM and J. F. Frank, University
of Georgia, Athens, GA, USA
- 2:30 • Application of Treatments to Reduce Contam-
T17 ination of Pork Variety Meats – HENRY
N. ZERBY, K. E. Belk, M. Hardin, W. Lloyd,
J. N. Sofos, and G. C. Smith, Colorado State
University, Fort Collins, CO, USA
- 2:45 • Inactivation of *E. coli* O157:H7 and *L. mono-*
T18 *cytogenes* on Apples Using Ozone, Chlorine
Dioxide, Sodium Hypochlorite and Peracetic
Acid – STEPHANIE L. RODGERS, J. N. Cash,
and E. T. Ryser, Michigan State University,
East Lansing, MI, USA
- 3:00 • Break – *Coffee and Dairy Products available*
in the Exhibit Hall
- 3:30 • Microbial Reduction of Laboratory Inoculated
T19 Produce Surfaces by Rinsing and Wiping with
Paper Towels and Comparison to 200 PPM
Chlorine Dip – BARRY MICHAELS, V. Gangar,
E. Meyers, H. Johnson, and M. S. Curiale,
Georgia Pacific Corporation, Palatka, FL, USA
- 3:45 • Efficacy of Ultraviolet Light to Eliminate *E. coli*
T20 O157:H7 in Unpasteurized Apple Cider –
JIM R. WRIGHT, S. S. Sumner, C. R. Hackney,
and M. D. Pierson, Virginia Tech Food Science
and Technology, Blacksburg, VA, USA
- 4:00 • Inhibition of Growth and Aflatoxin Production
T21 of *Aspergillus parasiticus* by Korean Soybean
Paste (Doen-jang) and Identification of
the Active Component – JONG-GYU KIM,
Y. W. Lee, P. G. Kim, W. S. Roh, and
H. Shintani, Keimyung University, Taegu, Korea
- 4:15 • Critical Role of *Pediococcus* sp. Cytoplasmic
T22 Membrane in Thermal Resistance – BASSAM
A. ANNOUS, USDA, Wyndmoor, PA, USA
- 4:30 • Antibiotic Resistance of Gram-negative Enteric
T23 Pathogens Isolated from Retail Meats –
ROBERT L. SUDLER JR., J. Meng, D. T. Ingram,
and L. Liu, University of Maryland College Park,
College Park, MD, USA
- 4:45 • Distribution and Role of Integrins in Multi-
T24 resistant *Salmonella* – LANCE F. BOLTON,
L. C. Kelley, and P. J. Fedorka-Cray, USDA-
ARS-PMSRU, Athens, GA, USA

Microbiology of Meat, Poultry, and Produce – Poster Session

Great Lakes Center – Exhibit Hall

(3:00 p.m. – 6:00 p.m.)

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

Co-Convenors: Michael Kayes and Brandy Knox

- P33 • Growth of *Salmonellae* in Previously Irradiated
Ground Beef – JAMES S. DICKSON and D. G.
Olson, Iowa State University, Ames, IA, USA
- P34 • Reduction of Bacterial Contamination on Hog
Carcasses with Hot Water and Organic Acid
Rinses – JAMES S. DICKSON, L. Eggenberger-
Solorzano, S. E. Niebuhr, R. J. Huber,
M. Hardin, and G. R. Acuff, Iowa State
University, Ames, IA, USA
- P35 • Dissemination of *L. monocytogenes* in a
Brazilian Frozen Chicken Nuggets Processing
Line – MARIA T. DESTRO and D. A. Rodrigues,
FCF/USP, Sao Paulo, SP, Brazil
- P36 • Production of Mortadella: Behavior of *L. mono-*
cytogenes under Commercial Manufacturing
and Storage Conditions – MARIA T. DESTRO
and L. S. Bersot, FCF/USP, Sao Paulo, SP, Brazil
- P37 • Enumeration of *E. coli* in Poultry Carcass Rinse
Using SimPlate and Petrifilm Methods –
PURNENDU C. VASAVADA, D. E. Townsend,
and G. Eaton, University of Wisconsin River
Falls, River Falls, WI, USA
- P38 • Sensitivity of *Salmonella typhimurium* DT104
to Irradiation – STEVEN E. NIEBUHR, R. J.
Huber, K. T. Rajkowski, D. W. Thayer, and J. S.
Dickson, Iowa State University, Ames, IA, USA
- P39 • Fate of *Salmonella* Enteritidis in Hard-cooked
Eggs – WALAIRUT CHANTARAPANONT and
L. R. Beuchat, University of Georgia, Griffin, GA,
USA
- P40 • Survival of Multidrug-resistant *Salmonella*
typhimurium DT104 in Egg Powders as
Affected by Water Activity and Temperature –
YONGSOO JUNG and L. R. Beuchat, University
of Georgia, Griffin, GA, USA
- P41 • Consumer Acceptability and Microbial
Inactivation in Home-style Beef Jerky Produced
by Various Methods – JUDY A. HARRISON,
M. A. Harrison, R. A. Rose-Morrow,
and R. L. Shewfelt, The University of Georgia,
Athens, GA, USA
- P42 • Evaluation of Environmental Microflora in a
Korean Meat Plant for HACCP Application –
DONG KWAN JEONG and J. S. Lee, Kosin
University, Pusan, Korea

- P43 • Reduction of Normal Flora by Irradiation and Its Effect on Multiplication of *L. monocytogenes* on Ground Turkey at 7°C in a Modified Atmosphere – DONALD W. THAYER and G. Boyd, USDA, ARS, ERRC, Wyndmoor, PA, USA
- P44 • Microbiological Contamination Baselines of Beef Carcasses, Wholesale Cuts and Retail Cuts – MINDY L. KAIN, J. N. Sofos, K. E. Belk, J. O. Reagan, G. C. Smith, D. R. Buege, W. P. Henning, J. B. Morgan, T. P. Ringkob, and G. R. Bellinger, Colorado State University, Fort Collins, CO, USA
- P45 • Therapeutic Anti-idiotypic Antibodies to *E. coli* K88 as an Alternative to Antibiotic Use in Meat Industry – ZIAD WAHEED JARADAT and R. R. Marquardt, University of Manitoba, Winnipeg, Manitoba, Canada
- P46 • *E. coli* O157:H7 Risk Assessment for Production and Cooking of Blade Tenderized Beef Steaks – SARAH B. SPORING, R. K. Phebus, J. L. Marsden, D. D. Retzlaff, M. D. Schafer, C. B. Chandler, and A. L. Truax, Kansas State University, Manhattan, KS, USA
- P47 • Reduction of *Salmonella* Contamination on Pork Products Using Radiant Wall Oven Heating – MARK A. HARRISON, S. Lively, and R. Toledo, The University of Georgia, Athens, GA, USA
- P48 • The Occurrence of *Campylobacter* spp. in Swine Carcass Dressing Operations – SAMUEL A. PALUMBO, J. E. Call, B. S. Marmer, and L. S. Yu, USDA, ARS, Wyndmoor, PA, USA
- P49 • Automated Real Time CCP Monitoring of External Cooked Sausage Temperature Utilizing Infrared Sensors and Statistical Process Monitoring – JEFFREY DECICCO, A. Cinar, J. E. Schlessler, and B. Verdorn, Illinois Institute of Technology, Chicago, IL, USA
- P50 • Extending the Shelf life of a Cooked Ham Product Using L-glucose and D-tagatose – DERRICK A. BAUTISTA, P. J. Shand, and R. B. Pegg, University of Saskatchewan, Saskatoon, Saskatchewan, Canada
- P51 • Microbial Population of Ready-to-Serve Salads in Tekirdog, Turkey – TUNCAY GUMUS, M. Arici, and O. Simjek, Trakya University, Tekirdog, Turkey
- P52 • A Quantitative Assessment of the Risk of *E. coli* O157:H7 in Apple Cider – SIOBAIN DUFFY and D. Schaffner, Cook College, Rutgers University, New Brunswick, NJ, USA
- P53 • Nature of *E. coli* O157:H7 Attachment to Lettuce Leaves and the Effect of Chlorine Disinfection – KAZUE TAKEUCHI and J. F. Frank, University of Georgia, Athens, GA, USA
- P54 • Sodium Chloride and Sodium Bicarbonate Washing Solution for Removal of Enterohemorrhagic *E. coli* O157:H7 from the Surfaces of Chopped Lettuce – MARLENE E. JANES, R. Nannapaneni, L. Howard, and M. G. Johnson, University of Arkansas, Fayetteville, AR, USA
- P55 • Survival of *E. coli* O157:H7 in Bovine Feces Applied to Lettuce and Effectiveness of Chlorine as a Disinfectant – LARRY R. BEUCHAT, University of Georgia, Griffin, GA, USA
- P56 • Survival of *E. coli* O157:H7 and *Salmonella* spp. on Fresh Strawberries – DAWN M. KNUDSEN and L. J. Harris, University of California, Davis, CA, USA
- P57 • Recovery of Generic *E. coli* from Juice – DAVID E. TOWNSEND and S. Higgins, IDEXX Laboratories, Inc., Westbrook, ME, USA
- P58 • Inactivation of *E. coli* O157:H7 and *Salmonella* spp. in Unpasteurized Apple and Orange Juice by High Pressure Processing – GUODONG WANG, E. Raghubeer, and E. Ting, National Food Processors Association, Dublin, CA, USA
- P59 • Cold Shock Decreases the Thermal Tolerance of Bacterial Pathogens in Apple and Orange Juice – DARRELL O. BAYLES, USDA, ARS, NAA, ERRC, Wyndmoor, PA, USA
- P60 • Use of pGFP to Determine the Survival of *E. coli* O157:H7 and *Salmonella typhimurium* in Manure Applied to Soil – GENEVIEVE JOHNSON, J. J. Churey, and R. W. Worobo, Cornell University, Geneva, NY, USA
- P61 • Keeping Quality of Sprouts after Irradiation and D Radiation Values for *Salmonella* and *E. coli* O157:H7 – KATHLEEN T. RAJKOWSKI, USDA, ARS, ERRC, Wyndmoor, PA, USA
- P62 • Bacterial Decrease of Vegetable Juice by Ozone and Gamma Ray Irradiation – KOOK HEE KANG and S. C. Kwon, Sungkyunkwan University, Suwon, Korea
- P63 • The Study on Safety and Crisp Property of Pickled Peeled-hot Chili – MING CHANG WU, National Pingtung University of Science and Technology, Nei Pu, Pingtung, Taiwan
- P64 • Microbial Analysis of Lettuce Used in Ready-to-Eat Salads – NEDRA E. ALLEN, A. P. Dessai, A. M. Mora, and S. L. Archie, CAENS, Tuskegee, AL, USA

TUESDAY MORNING — AUGUST 3, 1999

Produce and Sanitation — Technical Session

Dearborn Ballroom

Co-Convenors: Susan Sumner and Randy Worobo

- 8:30 • Development, Implementation and Analysis
T25 of an On-farm Food Safety Program for the Ontario Greenhouse Vegetable Grower's Marketing Board — MAURICIO B. RUIZ and D. A. Powell, University of Guelph, Guelph, Ontario, Canada
- 8:45 • Microbial Colonization with Biofilm Formation
T26 on Packaging Film and Vegetable Tissue of Ready-to-Use Packaged Spinach — SUSAN ABRAHAM, H. Schraft, and M. A. Tung, University of Guelph, Guelph, Ontario, Canada
- 9:00 • Effect of Microwave Cooking on the Recovery
T27 of *Cryptosporidium oocysts* from Spinach — MILDRED M. CODY, T. Arcaro, V. O'Leary, S. Roman, J. Rau, and R. Cordell, Georgia State University, Atlanta, GA, USA
- 9:15 • Survey of Production Practices Used by Virginia
T28 Apple Cider Processors — JIM R. WRIGHT, S. S. Sumner, C. R. Hackney, and M. D. Pierson, Virginia Tech, Blacksburg, VA, USA
- 9:30 • Science, Society, and Cider: A Comparative
T29 Analysis of Integrative Food Safety Risk Management in Canada and the US — JEFF SMITH, S. E. Grant, and D. A. Powell, University of Guelph, Guelph, Ontario, Canada
- 9:45 • A Quantitative Risk Assessment for Determining
T30 the Efficacy of Various Hand Washing Practices — REBECCA MONTVILLE and D. Schaffner, Cook College, New Brunswick, NJ, USA
- 10:00 • Break - *Coffee, Pastries, and Dairy Products*
available in the Exhibit Hall
- 10:30 • The Dynamics of Surface Cleaning and
T31 Sanitization — BARRY MICHAELS, V. Gangar, A. Roering, and M. S. Curiale, Georgia Pacific Corporation, Palatka, FL, USA
- 10:45 • Occurrence of *L. monocytogenes*, *Salmonella*,
T32 *E. coli* O157:H7 and Other Shiga-like Toxin-producing *E. coli* in Retail Fresh Vegetables and Ground Beef — W. MARK BARBOUR, M. Samadpour, P. Yang, F. Buck, S. Ammerman, G. Depavia, E. Mazengia, and D. Alfi, Qualicon, Inc., Wilmington, DE, USA
- 11:00 • Behavior of *E. coli* O157:H7 on Alfalfa Sprouts
T33 during the Sprouting Process as Influenced by Treatments with Various Chemicals — PETER J. TAORMINA and L. R. Beuchat, University of Georgia, Griffin, GA, USA

- 11:15 • Outbreaks of Viral Gastroenteritis Associated
T34 with Imported Raspberries — COLETTE GAULIN, D. Ramsay, P. Cardinal, and M. A. D'Halevyn, Public Health Center of Quebec City, Beauport, Canada

S7 Problems and Possible Solutions for the Development of Pathogen Resistance to Traditional Processing

(Sponsored by ILSI-N.A.)

Springwells Ballroom

Co-Convenors: Kathleen A. Glass and Laurie S. Post

- 8:30 • Critical Role of Membranes in Bacteriocins, Antibiotics, and Preservative Resistance — THOMAS J. MONTVILLE, Rutgers, The State University of New Jersey, New Brunswick, NJ, USA
- 9:00 • Potential for Emergence of Resistance to Antimicrobials Used in the Food Industry — P. MICHAEL DAVIDSON, University of Tennessee, Knoxville, TN, USA
- 9:30 • Problems and Solutions to Development of Pathogen Resistance to Thermal Processing — ALEJANDRO S. MAZZOTTA, National Food Processors Assn., Washington, D.C., USA
- 10:00 • Break - *Coffee, Pastries, and Dairy Products*
available in the Exhibit Hall
- 10:30 • F-ATPases, Adaptive Acid Tolerance and Coupled Oxidative Stress Resistance in Lactic-acid Bacteria — ROBERT E. MARQUIS, University of Rochester, Rochester, NY, USA
- 11:00 • Sanitizers/Disinfectants — LYNNE M. SEHULSTER, CDC, Atlanta, GA, USA
- 11:30 • Microbial Resistance and Food Irradiation — ELSA A. MURANO, Texas A&M University, College Station, TX, USA
- ### S8 Overview of Dairy Plant Regulations
- (Sponsored by the IAMFES Foundation Fund)
- #### Regency B-C
- Convenor: Gaylord Smith
- 8:30 • Overview of Agencies and Jurisdictions — CARY FRYE, IDFA, Washington, D.C., USA
- 9:00 • USDA Responsibilities as It Pertains to Plant Regulations — PHILIP WOLFF, USDA, Washington, D.C., USA
- 9:30 • OSHA and EPA's Role in Plant Regulations — JOHN WOLGEMUTH, J. W. Safety Management and Training, Hummelstown, PA, USA
- 10:00 • Break - *Coffee, Pastries, and Dairy Products*
available in the Exhibit Hall

- 10:30 • 1999 IMS Conference: From a State Perspective – PAUL HOGE, PDA, Harrisburg, PA, USA
- 11:00 • Bureau of Weights and Measures: Role in Plant Regulation – MICHAEL PINAGEL, Michigan Department of Agriculture, Williamston, MI, USA
- 11:30 • Viewpoint: Codex/International Standards – ROB BYRNE, NMPF, Arlington, VA, USA

Microbiological Methods and Miscellaneous – Technical Session

Dearborn Ballroom

Co-Convenors: Vijay Juneja and Elaine Barry

- 8:30 • An Epidemiological Study of *Pseudomonas*
T35 *aeruginosa* Strains Associated with Mastitis among Dairy Animals and Human Infections Based on Automated Ribotyping with the Restriction Enzyme *PvuII* – JAMES L. BRUCE, A. L. Rivas, M. Bodis, R. Klein, and K. Anderson, Qualicon, Inc., Wilmington, DE, USA
- 8:45 • Fate of *L. monocytogenes* and *E. coli* O157:H7
T36 in Dairy Foods – FATHY E. EL-GAZZAR and S. Farrag, University of Assiut, Egypt
- 9:00 • Biochemical Comparison of *L. lactis* spp. *Lactis*
T37 *biovar. diacetylactis* WRP297 and WRP298, Phage Resistant Variants, with Original Sensitive Culture Used for Cheese Manufacture – R. PIRABHAKARAN and R. Chand, National Dairy Research Institute, Karnal, India
- 9:15 • A Comparative Study of a Colorimetric ATP
T38 Measurement Test, ATP Bioluminescence and Protein Detection for Hygiene Monitoring – MARK CARTER, R. Pirzad, J. Baker, D. Ferguson, P. Meighan, and P. Grant, Celsis, Inc., Evanston, IL, USA
- 9:30 • An Isolation and Detection System for *L. mono-*
T39 *cytogenes* Using Fluorogenic and Chromogenic Substrates for Phosphatidylinositol-specific Phospholipase C – LAWRENCE RESTAINO, E. W. Frampton, R. M. Irbe, G. Schabert, and H. Spitz, R & F Laboratories, West Chicago, IL, USA
- 9:45 • Detection and Tracking of *L. monocytogenes*
T40 in Smoked Fish Plants – MARTIN WIEDMANN, D. Norton, M. McCamey, K. Gall, and K. J. Boor, Cornell University, Ithaca, NY, USA
- 10:00 • *Break – Coffee, Pastries, and Dairy Products*
available in the Exhibit Hall
- 10:30 • Effects of Cryogenic Cooling and Traditional
T41 Cooling on *Salmonella* Enteritidis Population in Table Eggs – LAVONDA A. HUGHES, D. E. Conner, P. A. Curtis, and K. M. Kcener, Auburn University, Auburn, AL, USA

- 10:45 • The Impact of Training on Grocery Store
T42 Seafood Employees' Food Safety and Sanitation Knowledge, Practices, and Department Profitability – TORI L. STIVERS and K. W. Gates, University of Georgia Marine Extension Service, Peachtree City, GA, USA
- 11:00 • Microbiological Monitoring of "Bobby" Calf
T43 Slaughter and Dressing: The Need for a Stand-alone Program Design – ROGER COOK, C. Esquerria, M. Biss, and S. Hathaway, Ministry of Agriculture & Forestry Regulatory Auth., Wellington, New Zealand
- 11:15 • Species and Strain Differentiation of *Pseudo-*
T44 *monas* spp. by Ribotyping – KATHRYN J. BOOR, M. Weidmann, J. W. Czakja, D. Weilmeier, S. Dineen, and R. Ralyea, Cornell University, Ithaca, NY, USA
- 11:30 • A Single-step Polymerase Chain Reaction for
T45 Combined Gene Detection and Epidemiological Typing (COGEDET) of *L. monocytogenes* Strains – JEFFREY M. FARBER, E. Daley, and D. Medeiros, Health Canada, Ottawa, Ontario, Canada
- 11:45 • Development of a Hybridoma Cell Line
T46 for the Production of a Monoclonal Antibody to the Pesticide Bromacil – SUNG J. KANG, J. S. Kang, and D. H. Chung, Gyengsang National University, Chinju, Gyangnam, Korea

General Food Microbiology – Poster Session

Great Lakes Center – Exhibit Hall

(10:00 a.m. – 1:00 p.m.)

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

Co-Convenors: Paul Angelino and Chris Kiefer

- P65 • Development of a Standard Method for
Assessing the Sanitizing Efficacy of a Prototype "GRAS" Produce Wash on Tomatoes – LINDA HARRIS, L. R. Beuchat, T. M. Kajs, C. H. Taylor, and T. E. Ward, University of California, Davis, CA, USA
- P66 • Assessment of the Microbial Efficacy of a
Prototype GRAS Produce Wash on Alfalfa Seeds, Sprouts, and Selected Salad Vegetables – LARRY R. BEUCHAT and T. E. Ward, University of Georgia, Griffin, GA, USA
- P67 • Control of *E. coli* O157:H7 in Milk Using a
Natural Antimicrobial Agent-Bacteriophage – STEPHANIE ARCHIE, A. M. Mora, N. E. Allen, C. Davis, and A. P. Dessai, Tuskegee University, Tuskegee, AL, USA
- P68 • Effect of Starter Culture and Fermentation
Temperature on Survival of *E. coli* O157:H7 and *L. monocytogenes* during Fermentation and Storage of Soy Yogurt – MICHAEL M. KAYES, B. Saeng-On, D. A. Golden, and J. L. Collins, The University of Tennessee, Knoxville, TN, USA

- P69 • Effect of Packaging Atmosphere and Storage Temperature on Survival of *L. monocytogenes* on Culture Media Containing Elevated NaCl and Lactic Acid – ROBERT C. WILLIAMS and D. A. Golden, The University of Tennessee, Knoxville, TN, USA
- P70 • Occurrence of *L. monocytogenes* in Mexican Cheeses – JORGE A. SALTIERAL O., C. E. Solano L., V. B. Alvarez, B. Garcia F., and H. Hernandez S., Ohio State University, Columbus, OH, USA
- P71 • Effect of Simulated Gastric Fluid and Bile on Survival of *Vibrio vulnificus* and *Vibrio vulnificus* Phage – JAHEON KOO, A. DePaola, and D. L. Marshall, Mississippi State University, Mississippi State, MS, USA
- P72 • In Vitro Evaluation of the Effects of Nitrite and NaCl on the Antimicrobial Activity of Lysozyme, Nisin and EDTA Combination Treatments – ALEXANDER O. GILL and R. A. Holley, University of Manitoba, Winnipeg, Manitoba, Canada
- P73 • Fate of pGFP-bearing *E. coli* O157:H7 in Ground Beef at 2° and 10°C, and Effects of Lactate, Diacetate, and Citrate – SRILATHA AJJARAPU and L. A. Shelef, Wayne State University, Detroit, MI, USA
- P74 • Use of Extracts of *Nigella sativa* (NS) to Inhibit Spoilage and Pathogenic Microorganisms in Rainbow Trout – MONA ELGAYYAR and F. A. Draughon, The University of Tennessee, Knoxville, TN, USA
- P75 • Inhibition of *E. coli* O157:H7 by Herbal and Spice Essential Oils – MONA ELGAYYAR, F. A. Draughon, D. A. Golden, and J. R. Mount, The University of Tennessee, Knoxville, TN, USA
- P76 • Membrane Bio-catalysts as Growth Stimulator of *L. monocytogenes* in Enrichment Media – PRAVATE TUITEMWONG, J. Wongchavalit, K. Tuitemwong, and D. Y. C. Fung, King Mongkut's University of Technology Thonburi, Bangkok, Thailand
- P77 • Combined Effect of Antibiotic and Competitive-Exclusion Treatment on *Salmonella* Enteritidis Fecal Shedding in Molted Laying Hens – KUN-HO SEO, P. S. Holt, C. L. Hofacre, and R. K. Gast, Southeast Poultry Research Laboratory, USDA, ARS, Athens, GA, USA
- P78 • Mechanisms of Antibacterial Activity of Allyl Isothiocyanate – CHIA-MIN LIN and C. -I. Wei, University of Florida, Gainesville, FL, USA
- P79 • Enhanced Inhibitory Effect of *E. coli* O157:H7 by Chitooligosaccharide and Monolaurin – DEOG-HWAN OH, M. K. Lee, and B. K. Park, Kangwon National University, Chunchon, Kangwon, Korea
- P80 • Effect of Balsam Apple Extract on Bacteria – CHUNG-YI HUANG, C. H. Lai, P. Y. Peng, F. C. Chao, H. L. Liang, and D. K. Kan, I-Lan Institute of Technology, I-Lan, Taiwan R.O.C.
- P81 • Water Activity pH and Potassium Sorbate Concentration Effects on the Growth/No Growth Interface of *Saccharomyces cerevisiae* – AURELIO LOPEZ-MALO, S. Guerrero, and S. M. Alzamora, Universidad de las Americas-Puebla, Puebla, Mexico
- P82 • Synergistic Effect of Vanillin and Potassium Sorbate Combinations to Inhibit Mold Growth – AURELIO LOPEZ-MALO, B. Matamoros-Leon, and A. Argaiz, Universidad de las Americas-Puebla, Puebla, Mexico
- P83 • Modeling and Simulating Growth of *Clostridium botulinum* at Varying Inoculum Size, Temperature, pH, and Salt Concentration – LIHUI ZHAO, Rutgers University, New Brunswick, NJ, USA
- P84 • Modeling the Bacterial Spoilage of Ready-to-Drink Beverages – ALYCE STILES-BATTEY and D. Schaffner, Kraft Foods, Inc., Tarrytown, NY, USA
- P85 • Use of *Bacillus megaterium* Spore Germination and Cell Parameter Distributions to Predict Spoilage Times at Low Inoculum Size and Differing Environmental Conditions – MARISA L. CAIPO and D. W. Schaffner, Rutgers University, New Brunswick, NJ, USA
- P86 • Survival of *E. coli* O157:H7 in Dried Beef as Affected by Water Activity, Sodium Chloride, and Temperature – J.-H. RYU, Y. Deng, and L. R. Beuchat, University of Georgia, Griffin, GA, USA
- P87 • Critical Temperatures to Inhibit *Zygosaccharomyces bailii* Growth in Mango Puree Preserved by Combined Factors – ENRIQUE PALOU, X. Castanon, J. Welte-Chanes, and A. Lopez-Malo, Universidad de las Americas-Puebla, Puebla, Mexico
- P88 • Growth and Recovery of Selected Gram Negative Bacteria in Reconditioned Wastewater – KATHLEEN T. RAJKOWSKI and E. Rice, USDA, ARS, NAA, ERRC, Wyndmoor, PA, USA
- P89 • Contamination Ways of Cold-smoked Fish with *L. monocytogenes* – MARIELLE GAY, ASEPT, Laval Cedex 9, France
- P90 • The Effect of Temperature on the Survival of *Shigella flexneri* at Low pH – LAURA L. ZAIKA and J. S. Fanelli, USDA, ARS, NAA, ERRC, Microbial Food Safety RU, Wyndmoor, PA, USA
- P91 • Models for Growth of *Zygosaccharomyces bailii* in High-acid Foods – PHYLLIS JENKINS, P.G. Poulos, M. B. Cole, M. Vandeven, and J. D. Legan, Nabisco, Inc., E. Hanover, NJ, USA

- P92 • Survival of *E. coli* O157:H7 in Margarine, Reduced Fat Spreads and Liquid Water-in-Oil Toppings – MICHAEL C. CIRIGLIANO, A. M. Keller, R. B. Zemser, and P. J. Rothenberg, Lipton, Cresskill, NJ, USA
- P93 • Growth Response of *L. monocytogenes*, *Salmonella* Enteritidis and *Salmonella typhimurium* DT104 in Pasteurized and Raw Liquid Whole Egg Held at Chill Abuse – MICHAEL C. CIRIGLIANO and R. T. McKenna, Lipton, Cresskill, NJ, USA
- P94 • Modulation Effects of Antioxidant Vitamins on Ochratoxin A-induced Oxidative Toxicity in Mice – JUNG HYEON PARK, S. J. Kang, and D. H. Chung, Gyengsang National University, Chinju, Gyangnam, Korea
- P95 • Dry Rehydratable Film Method for the Rapid Enumeration of *Staphylococcus aureus* in Foods: 3M Petrifilm Rapid *S. aureus* Count Plates – PATRICK A. MACH, K. Lindberg, and D. McIntyre, 3M Microbiology Products, St. Paul, MN, USA
- P96 • Microrestriction Fingerprinting: A New Tool for Studying the Molecular Epidemiology of *E. coli* O157:H7 – MANSOUR SAMADPOUR, D. Alfi, and L. Grimm, University of Washington, Seattle, WA, USA
- P97 • Model for the Implementation of HACCP in the Food Industry of Developing Countries, JAIRO ROMERO, T Tecn De Alimentos, Bogota, Colombia

TUESDAY AFTERNOON — AUGUST 3, 1999

- S9 **General Session — Anatomy of a Multi-state USA Listeriosis Outbreak: Issues, Insights and Take-home Messages**
Hubbard Ballroom
Co-Convenors: Bob Brackett and Jeff Farber
- 1:30 • Molecular Typing of *Listeria monocytogenes* in US Outbreak, MARTIN WIEDMANN, Cornell University, Ithaca, NY, USA
- 2:00 • Epidemiology of *Listeria* Outbreak, PAUL MEAD, CDC, Atlanta, GA, USA
- 2:30 • Industry Perspective of *Listeria* Outbreak, DANE BERNARD, National Food Processors Association, Washington, D.C., USA
- 3:00 • Panel Discussion
- 3:30 • Break - *Coffee and Dairy Products available in the Hubbard Foyer*
- 4:00 • IAMFES Business Meeting

WEDNESDAY MORNING — AUGUST 4, 1999

- S10 **USDA Risk Assessment of *E. coli* O157:H7 in Ground Beef**
Dearborn Ballroom
Convenor: Mark Powell
- 8:30 • An Overview and Scope of the USDA Risk Assessment of *E. coli* O157:H7 in Ground Beef – MARK POWELL, USDA/FSIS/OPHS/ERAD, Washington, D.C., USA
- 8:40 • Production Module – ERIC EBEL, USDA/FSIS, Fort Collins, CO, USA
- 9:00 • Slaughter Concentration Variables – TANYA ROBERTS, USDA/ERS, Washington, D.C., USA
- 9:20 • Slaughter Product Fraction Variables – PETER COWEN, USDA/FSIS/OPHS/ERAD, Washington, D.C., USA
- 9:40 • Slaughter Simulation Model – CLARE NARROD, USDA/FSIS/OPHS/ERAD, Washington, D.C., USA
- 10:00 • *Break - Coffee, Pastries, and Dairy Products available in the Hubbard Foyer*
- 10:30 • Preparation Module – WAYNE SCHLOSSER, USDA/FSIS, Fort Collins, CO, USA
- 10:50 • Public Health Module – PEG COLEMAN, USDA/FSIS/OPHS/ERAD, Washington, D.C., USA
- 11:10 • Risk Communication – PETER COWEN, USDA/FSIS/OPHS/ERAD, Washington, D.C., USA
- 11:30 • Panel Discussion
- S11 **Animal Waste Management and Its Relationship to Food Safety**
(Sponsored by ILSI-N.A.)
Springwells Ballroom
Co-Convenors: William R. Aimutis and Marguerite A. Neill
- 8:30 • Microbes and Manure: Animal and Human Health Concerns – ALICE N. PELL, Cornell University, Ithaca, NY, USA
- 9:00 • Overview of Dairy, Swine, Poultry and Beef Waste Management Systems and Options in the United States – ROBERT T. BURNS, University of Tennessee, Knoxville, TN, USA
- 9:30 • Persistence of Pathogenic Bacteria in Animal Waste – CAROLYN HOVDE BOHACH, University of Idaho, Moscow, ID, USA
- 10:00 • *Break - Coffee, Pastries, and Dairy Products available in the Hubbard Foyer*
- 10:30 • Persistence of Viruses in Animal Waste – DEAN O. CLIVER, University of California-Davis, Davis, CA, USA

- 11:00 • Presence of Microbial Pathogens in Processed Animal Waste Used as Animal Feed – JAMES S. CULLOR, University of California, Tulare CA, USA
- 11:30 • Animal and Waste Water Management: Who's Minding the Store? – EMILIO ESTEBAN, CDC, Atlanta, GA, USA
- S12 New Emerging Pathogens – *Mycobacterium* spp.**
Regency B-C
Co-Convenors: Jeff Farber and Yvonne Taylor
- 8:30 • Overview of *Mycobacterium* spp. and Their Role as Foodborne Pathogens – LUCIA MUTHARIA, University of Guelph, Guelph, Ontario, Canada
- 9:00 • Survival of *M. paratuberculosis* in HTST Milk – To be announced
- 9:30 • *Mycobacterium* spp. as Environmental Pathogens – YVONNE TAYLOR, University of Ottawa, Ottawa, Ontario, Canada
- 10:00 • *Break – Coffee, Pastries, and Dairy Products available in the Hubbard Foyer*
- 10:30 • Crohn's Disease and the Link to Foodborne Pathogens: Fact or Fallacy – DAVID ACHESON, NIH, Tufts University, Boston, MA, USA
- 11:00 • Methods to Detect and Identify *Mycobacterium* spp. in Environmental Samples – SANDY SMOLE, Boston VA Healthcare System, Boston, MA, USA
- 11:30 • Panel Discussion

S13 HACCP in Retail Operations

- Regency E-K*
Co-Convenors: O. Peter Snyder, Jr. and Frank Yiannas
- 8:30 • FDA Retail HACCP – JEANETTE B. LYONS, FDA, Washington, D.C., USA
- 8:55 • Retail HACCP in Florida – DEBRA K. WILLIAMS, State of Florida, Tallahassee, FL, USA
- 9:20 • The Maryland Voluntary Retail HACCP Program – LISL D. WILKINSON, Maryland Hospitality Education Foundation, Baltimore, MD, USA
- 9:45 • *Break – Coffee, Pastries, and Dairy Products available in the Hubbard Foyer*
- 10:15 • HACCP in Hotel Food Service – DONALD B. GRIM, Marriott International, Inc., Washington, D.C., USA
- 10:40 • HACCP in Food Markets – FREDRICK W. REIMERS, H-E-B Grocery Company, San Antonio, TX, USA
- 11:05 • HACCP in Restaurants – DEE CLINGMAN, Darden Restaurants, Inc., Orlando, FL, USA

- 11:30 • Integrating FDA Fisheries, USDA, FDA Industrial, and FDA Retail HACCP into One Set of National Industry Self-control Requirements – O. PETER SNYDER, JR., Hospitality Institute of Technology and Management, St. Paul, MN, USA

WEDNESDAY AFTERNOON – AUGUST 4, 1999

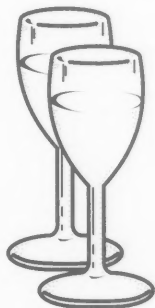
- S14 USDA HACCP Implementation – Where Have We Been; Where Are We Going?**
Dearborn Ballroom
Co-Convenors: Robert Gravani and Margaret Hardin
- 1:30 • Overview and Reflections of HACCP for Meat and Poultry Plants – DANE T. BERNARD, National Food Processors Association, Washington, D.C., USA
- 2:00 • HACCP Implementation Experiences in a Large Plant – PETER BODNARUK, ConAgra Refrigerated Prepared Foods, Downers Grove, IL, USA
- 2:30 • HACCP Implementation Experiences in a Small Plant – HERB TETENS, Marathon Enterprises, Jersey City, NJ, USA
- 3:00 • *Break – Coffee and Dairy Products available in the Hubbard Foyer*
- 3:30 • USDA/FSIS Overview of HACCP – Past, Present and Future Challenges – BARBARA MASTERS, USDA/FSIS Technical Service Center, Omaha, NE, USA
- 4:00 • HACCP Model Demonstration Project Experiences – The Future? – ALAN OSER, Hatfield Quality Meats, Inc., Hatfield, PA, USA
- 4:30 • Regulatory Challenges and Perspectives for the Future – MICHAEL ROBACH, International Continental Grain Company, Gainesville, GA, USA
- S15 *Campylobacter* and Food Safety: The State of the Science**
Springwells Ballroom
Co-Convenors: J. Eric Line and Scott Fritschel
- 1:30 • Prevalence of *Campylobacter* in Human Disease – FRED ANGULO, CDC, Atlanta, GA, USA
- 2:00 • Guillain-Barre Syndrome and Other Chronic Sequellae of Campylobacteriosis – DINA MISHU, Vanderbilt University Children's Hospital, Nashville, TN, USA
- 2:30 • Modern Cultural Methodology for the Isolation of *Campylobacter* spp. – J. ERIC LINE, USDA, ARS, Athens, GA, USA
- 3:00 • *Break – Coffee and Dairy Products available in the Hubbard Foyer*

- 3:30 • Subtyping of *Campylobacter* spp. – SCOTT FRITSCHER, Qualicon®, Inc., Wilmington, DE, USA
- 4:00 • Risk Assessment and Risk Management Implications of *Campylobacter jejuni* in Poultry, AAMIR FAZIL, Decisionalysis Risk Consultants, Guelph, Ontario, Canada
- 4:30 • Poultry Industry Response to the Challenges of *Campylobacter* – LENORE BENNETT, Perdue Farms, Horsham, PA, USA
- S16 Methods for the Detection of Infectious Viruses in Foods**
(Sponsored by the IAMFES Foundation Fund)
Regency B-C
Convenor: Gary P. Richards
- 1:30 • An Overview of Conventional Methods for Detecting Enteric Viruses in Foods – DEAN O. CLIVER, University of California-Davis, Davis, CA, USA
- 2:00 • Limitations in Cell Culture and Molecular Biological Methods for Detecting Infectious Viruses in Foods – GARY P. RICHARDS, USDA, ARS, Dover, DE, USA
- 2:30 • Integrated Cell Culture-PCR Techniques – CHARLES P. GERBA, University of Arizona, Tucson, AZ, USA
- 3:00 • *Break – Coffee and Dairy Products available in the Hubbard Foyer*
- 3:30 • Detection and Control of Viruses in Produce – MARK D. SOBSEY, University of North Carolina, Chapel Hill, NC, USA
- 4:00 • Role of Molecular Epidemiology in Virus Outbreak Investigations – LEE-ANN JAYKUS, North Carolina State University, Raleigh, NC, USA
- 4:30 • Panel Discussion
- S17 The Seafood Safety Initiative**
Regency E-K
Co-Convenors: Carlos Abeyta and Custy Fernandes
- 1:30 • Overview of Seafood Safety Initiative – ROBERT BUCHANAN, FDA, Washington, D.C., USA
- 2:00 • Considerations for Testing of *Listeria* in Seafood – CATHERINE DONNELLY, University of Vermont, Burlington, VT, USA
- 2:30 • Control of Viral and Bacterial Human Pathogens in Shellfish – WILLIAM BURKHARDT III, FDA, Dauphin Island, AL, USA
- 3:00 • *Break – Coffee and Dairy Products available in the Hubbard Foyer*
- 3:30 • Food Service Chain Experience – KEITH JACKSON, Darden Restaurants, Orlando, FL, USA
- 4:00 • Levels of *V. vulnificus* and *V. parahaemolyticus* in Retail Seafood – ANGELO DEPAOLA, FDA, Dauphin Island, AL, USA
- 4:30 • West Coast Working Group on *V. parahaemolyticus* Outbreaks – To be announced

AN EVENING IN WINE COUNTRY

Tuesday, August 3, 1999

5:30 p.m. – 10:30 p.m.



A quiet country evening begins in surroundings reminiscent of an "Old World" wine cellar at Pelee Island Winery, located near Kingsville, Ontario. Then tempt your tastebuds in the tropical gardens of Colasanti while exotic birds call to you from the wild.

Relax and join your friends and colleagues at a quiet country setting. See the registration form on page 449, or call the IAMFES office at 800.369.6337; 515.276.3344; Fax us at 515.276.8655; or visit our Web site at www.iamfes.org for additional information.



(When traveling to Canada, proof of citizenship such as voter's registration, passport, or birth certificate is required.)



The Workshops

Friday & Saturday
July 30-31, 1999

Hyatt Regency Dearborn – Dearborn, Michigan

WORKSHOP I – Procedures to Investigate Foodborne Illness

WORKSHOP PRESENTER:

Frank L. Bryan, Ph.D., M.P.H., Food Safety Consultant

Dr. Frank L. Bryan currently works as a Consultant developing HACCP systems for private companies and governmental agencies in the United States as well as for many countries through the Pan American Health Organization (PAHO) and the World Health Organization (WHO). Dr. Bryan was Consultant for the food safety office of the WHO and he was formerly with the Center for Disease Control where he specialized in epidemiology and foodborne disease.

Dr. Bryan conducts training on HACCP and foodborne disease investigation techniques, and provides expert consultation to companies in food safety and related litigation. He is a member and secretary of the International Commission on Microbiological Specifications for Foods.

Dr. Bryan has chaired the IAMFES Committee on Communicable Diseases Affecting Man since 1970. During this tenure, the committee published and updated three editions of the manual, *Procedures to Investigate Foodborne Illness*. The committee also published three editions of *Procedures to Investigate Waterborne Illness*, an edition of *Procedures to Investigate Arthropod-borne and Rodent-borne Illness* and *Procedures to Implement the Hazard Analysis Critical Control Point System*.

WHAT YOU WILL LEARN:

Participants will conduct a simulated outbreak investigation using the forms, tables and keys in the 1999 5th edition, *Procedures to Investigate Foodborne Illness*. This workshop will teach interviewing techniques, procedures for determining responsible foods, calculation of epidemic curves and attack rates, field investigation methods to determine source and mode of contamination and other factors that contribute to the cause of the outbreak.

WHO SHOULD ATTEND:

Food protection professionals from city, county, state, and federal health agencies that investigate outbreaks; sanitarians; veterinarians; epidemiologists; administrators; disease surveillance personnel; educators; and food industry and regulatory personnel.

WORKSHOP II – An Insider's Look at Microbial Risk Assessment

MODERATOR AND FACILITATOR:

Don Schaffner, Ph.D., Rutgers University

Dr. Schaffner is the Lead Scientist with the Food Risk Analysis Initiative at Rutgers. His research interests include modeling microbial behavior in foods and microbial quantitative risk assessment.

WORKSHOP PRESENTERS:

Robert McDowell, United States Department of Agriculture

Robert McDowell is Senior Staff Economist for Risk Analysis Systems at the Animal and Plant Health Inspection Service of the USDA where he is active in methods development, training, and application of risk analysis in agriculture and public health.

Greg Paoli, Decisionalysis Risk Consultants, Inc.

Greg Paoli is a Principal in Decisionalysis Risk Consultants, Inc. He specializes in the development of risk assessment models to support decisions primarily in the fields of food safety and environmental health.

William H. Ross, Ph.D., Bureau of Biostatistics and Computing Applications

Dr. Ross worked the last eight years for the Food Program of Health Canada in the area of statistical applications to predictive microbiology, microbial risk assessment, and micro-nutrient risk assessment. He presently leads the project for the renewal of the Risk Management Framework for Health Canada's Health Protection Branch.

Ewen C.D. Todd, Ph.D., Health Protection Branch, Health Canada

Dr. Todd has been a Research Microbiologist in the Bureau of Microbial Hazards for 30 years working in methods development for pathogens, foodborne disease surveillance, costs of foodborne disease and risk assessments for pathogens on foods. He is currently responsible for the Health Canada quantitative risk assessment for *Salmonella* Enteritidis in shell eggs.

Richard C. Whiting, Ph.D., Food and Drug Administration
Dr. Whiting has an active research program in modeling the growth and survival of foodborne microbial pathogens. This research ranges from formulating new mathematical models to composing a personal computer software program to make the models easily and widely available.

WHAT YOU WILL LEARN:

This workshop will compare and contrast two risk assessments conducted to address the risk of *Salmonella* Enteritidis in shell eggs to illustrate how different data and assumptions can impact the resulting risk estimate. The workshop will also demonstrate how distributions are derived for data, how they are input into commercial risk assessment software, and how the software can be used to look at "What if?" scenarios.

WHO SHOULD ATTEND:

Food industry microbiologists, HACCP coordinators, government food microbiologists, food microbiology researchers, microbial modelers and anyone else interested in an in-depth look at microbial risk assessment.

HOURS FOR BOTH WORKSHOPS:

Friday, July 30, 1999

Registration 1:00 p.m.

1:30 p.m. - 5:00 p.m.

Saturday, July 31, 1999

Continental Breakfast at 8:00 a.m.

8:30 a.m. - 5:00 p.m.

Lunch Provided Noon - 1:30 p.m.

1999 IAMFES Workshops • Registration Form •

- WORKSHOP I: Procedures to Investigate Foodborne Illness**
 WORKSHOP II: An Insider's Look at Microbial Risk Assessment

Hyatt Regency Dearborn, Dearborn, Michigan - Friday & Saturday, July 30-31, 1999

First Name (will appear on badge)	PLEASE PRINT	Last Name
Title	Employer	
Address	City	Country
	State/Province	Postal Code/Zip + 4
Area Code & Telephone	Fax	E-mail

Check Enclosed   

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Name on Card: _____

Expiration Date: _____

Signature: _____

For further information, please contact IAMFES at 800.369.6337; 515.276.3344; Fax: 515.276.8655; E-mail: jcattanach@iamfes.org.

Refund/Cancellation Policy

Registration fees, less a \$50 administrative charge, will be refunded for written cancellations received by July 16, 1999. 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 6, 1999. The workshop may be cancelled if sufficient enrollment is not received by July 2, 1999.

• Registration •

WORKSHOP I: Procedures to Investigate Foodborne Illness

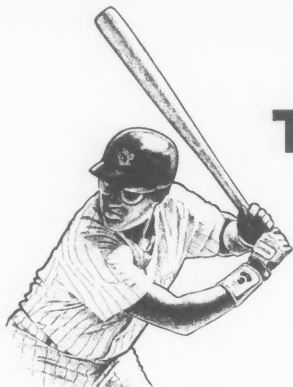
	Before 7/1/99	After 7/1/99
IAMFES Member	\$220	\$270
NonMember	\$315	\$365

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

WORKSHOP II: An Insider's Look at Microbial Risk Assessment

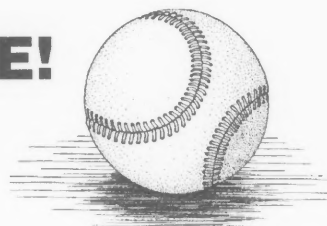
	Before 7/1/99	After 7/1/99
IAMFES Member	\$310	\$360
NonMember	\$405	\$455

TOTAL AMOUNT ENCLOSED: \$ _____
(US Funds on US Bank)



TAKE ME OUT TO THE BALLGAME!

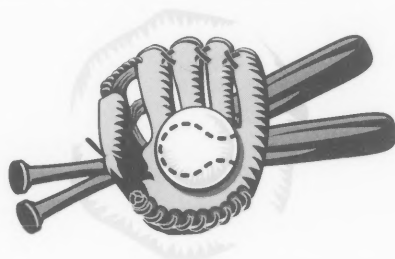
Tuesday, August 3, 1999
6:00 p.m. – 10:30 p.m.



Cheer yourself silly as the Detroit Tigers take on the Chicago White Sox in one of the oldest baseball stadiums in the US. When the game is over, you can claim to be one of the last fans to visit the original Tiger Stadium before it closes. Tickets and round trip bus transportation included.

To join your friends and colleagues at a baseball game, see the registration form on page 449, or call the IAMFES office at 800.369.6337; 515.276.3344; Fax: 515.276.8655; or visit our **Web site at www.iamfes.org** for additional information.

Hurry and register today!

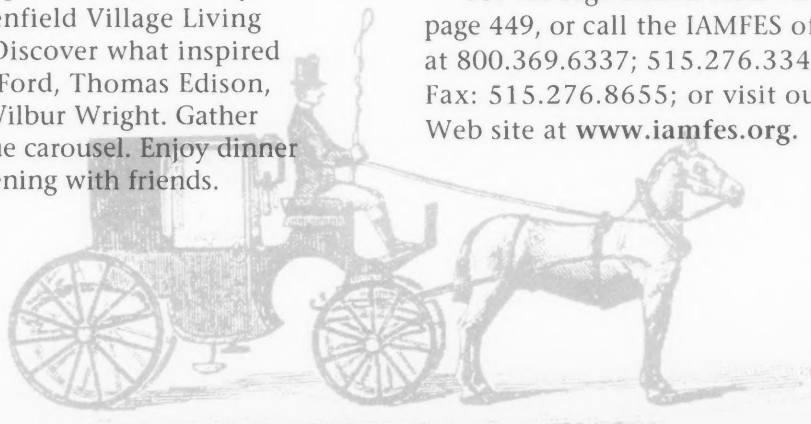


HISTORICAL ADVENTURES

Monday, August 2, 1999
6:00 p.m. – 9:30 p.m.

Ride a carriage back into history at the Greenfield Village Living Museum. Discover what inspired inventors Henry Ford, Thomas Edison, and Orville and Wilbur Wright. Gather around the antique carousel. Enjoy dinner and spend the evening with friends.

See the registration form on page 449, or call the IAMFES office at 800.369.6337; 515.276.3344; Fax: 515.276.8655; or visit our Web site at www.iamfes.org.



IAMFES ANNUAL MEETING



EVENT INFORMATION

EVENING EVENTS

Cheese and Wine Reception Sunday, August 1, 1999, (8:00 p.m. – 10:00 p.m.)

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

Exhibit Hall Reception Monday, August 2, 1999, (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 at an informal reception.

Historical Adventures Monday, August 2, 1999, (6:00 p.m. – 9:30 p.m.)

Ride a carriage back into history at the Greenfield Village Living Museum. Discover what inspired inventors Henry Ford, Thomas Edison, and Orville and Wilbur Wright. Gather around the antique carousel. Enjoy dinner and spend the evening with friends.

An Evening in Wine Country Tuesday, August 3, 1999, (5:30 p.m. – 10:30 p.m.)

A quiet country evening begins in surroundings reminiscent of an "Old World" wine cellar at Pelee Island Winery, located near Kingsville, Ontario. Then tempt your taste buds in the tropical gardens of Colasanti while exotic birds call to you from the wild.

(When traveling to Canada, proof of citizenship such as voter's registration, passport, or birth certificate is required.)

Take Me Out to the Ballgame Tuesday, August 3, 1999, (6:00 p.m. – 10:30 p.m.)

Cheer yourself silly as the Detroit Tigers take on the Chicago White Sox in one of the oldest baseball stadiums in the US. When the game is over, you can claim to be one of the last fans to visit the original Tiger Stadium before it closes. Tickets and round trip bus transportation included.

IAMFES Awards Banquet Wednesday, August 4, 1999, (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.

TOURS

Great Lakes and "Motor City" Culture Sunday, August 1, 1999, (9:30 a.m. – 3:00 p.m.)

Belle Isle, a 1000 acre island park, beckons you to visit the Dossin Great Lakes Museum and other cultural attractions. Tour the Coast Guard Station on the Detroit River. Then it's smooth sailing to lunch on the waterfront at Sinbad's restaurant. Start your engines at the interactive "Motor City Exhibition" in the Detroit Historical Museum. Race to explore your favorite destinations including the Detroit Institute of Art, the Museum of African American History and the Detroit Science Center.

At Home with the Auto Barons Monday, August 2, 1999, (9:30 a.m. – 3:30 p.m.)

Just for a day, imagine you are a guest in Fair Lane, the 15th and final home of Henry Ford. Stroll through the same rooms as some of the world's most influential people.

Don't forget your invitation for lunch at the Eleanor and Edsel Ford Estate, located on the shores of Lake St. Claire. Architect Albert Kahn created a sense of the English countryside in the home at Grosse Point. Inside, original masterpieces line the walls. Your tour includes the home, the scenic gardens, the pool-house, the garage with Mrs. Ford's custom-built 1952 Lincoln Town Car, and the children's playhouse.

All Things Canadian Tuesday, August 3, 1999, (9:30 a.m. – 3:30 p.m.)

Watch as world famous Canadian Club Whiskey is produced at the Hiram Walker & Sons Distillery. Then stroll through the classical Jackson Park gardens featuring over 12,000 rose bushes in bloom. Soak up the local flavor during lunch at a restaurant in downtown Windsor, Canada. Step inside the log cabin used as terminal of the Underground Railway built by fugitive slave John Freeman Walls.

(When traveling to Canada, proof of citizenship such as voter's registration, passport, or birth certificate is required.)

GOLF TOURNAMENT

FORE! Best-Ball Golf Tournament Sunday, August 1, 1999, (6:00 a.m. – 2:00 p.m.)

A swinging good time at the newest golf course in the area — the Inkster Golf Course. You don't even need to know how to play to win a prize. Golf, transportation, breakfast, lunch and prizes all included in your registration fee.



IAMFES 86th ANNUAL MEETING AUGUST 1-4, 1999 DEARBORN, MICHIGAN

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

■ Registration Information

Please mail the registration form with payment today. Registrations post-marked after July 1, 1999 must pay the late registration fee. Checks should be made payable to: IAMFES, 6200 Aurora Avenue, Suite 200W, Des Moines, Iowa 50322-2863, USA. For faster service, use your credit card and call 800.369.6337, or fax the completed registration form with credit card information to 515.276.8655.

■ Refund/Cancellation Policy

Registration fees, minus a \$50 processing charge and any applicable bank charges, will be refunded for written cancellations received by July 15, 1999. **No refunds will be made after July 15;** however, the registration may be transferred to a colleague with written notification. Refunds will be processed after August 6, 1999.

■ Hotel Information

For reservations, contact the hotel directly and identify yourself as an IAMFES Annual Meeting attendee to receive a special rate of \$102 per night, single or double. Make your reservations as soon as possible, this special rate is available only until July 2, 1999.

Hyatt Regency Dearborn
Fairlane Town Center
Dearborn, Michigan 48126
Phone: 313.593.1234; Fax: 313.593.3366

■ EVENTS

(See the preceding page for detailed descriptions)

■ Evening Events

Sunday, August 1, 1999

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

Monday, August 2, 1999

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

Historical Adventures (6:00 p.m. – 9:30 p.m.)

Tuesday, August 3, 1999

An Evening in Wine Country (5:30 p.m. – 10:30 p.m.)

Take Me Out to the Ballgame (6:00 p.m. – 10:30 p.m.)

Wednesday, August 4, 1999

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

■ Tours

Sunday, August 1, 1999

Great Lakes and "Motor City" Culture
(9:30 a.m. – 3:00 p.m.) (Lunch included)

Monday, August 2, 1999

At Home with the Auto Barons
(9:30 a.m. – 3:30 p.m.) (Lunch included)

Tuesday, August 3, 1999

All Things Canadian
(9:30 a.m. – 3:30 p.m.) (Lunch included)

■ Golf Tournament

Sunday, August 1, 1999

FORE! Best-Ball Golf Tournament (6:00 a.m. – 2:00 p.m.)



MEMBERSHIP RATES

	UNITED STATES	CANADA/ MEXICO	INTERNATIONAL
Membership with <i>Journal of Food Protection and Dairy, Food and Environmental Sanitation</i> (Student Membership)*	\$140.00 (\$70.00)	165.00 (\$95.00)	\$210.00 (\$140.00)
Membership with <i>Dairy, Food and Environmental Sanitation</i> (Student Membership)*	\$85.00 (\$42.50)	\$95.00 (\$52.50)	\$110.00 (\$67.50)
(Student Membership* with <i>Journal of Food Protection</i>)	(\$42.50)	(\$57.50)	(\$87.50)

**Full-time student verification required*

All prices include Shipping & Handling

Prices effective through August 31, 1999

REGISTRATION FORM

IAMFES 86th Annual Meeting August 1-4, 1999 Dearborn, Michigan

FOR OFFICE USE

Last name

First initial

Registration #

DFES

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 _____

IAMFES Member since: 19 _____

 Regarding the *Americans with Disabilities Act*, please indicate special requirements you may have. _____

REGISTER BY JULY 1, 1999 TO AVOID LATE REGISTRATION FEES

REGISTRATION FEES:

	MEMBERS	NONMEMBERS	AMOUNT
Registration (Awards Banquet included)	\$ 245 (\$295 late)	\$365 (\$415 late)	_____
IAMFES Student Member*	\$ 40 (\$ 50 late)	Not Available	_____
Retired IAMFES Member*	\$ 40 (\$ 50 late)	Not Available	_____
One Day Registration: <input type="checkbox"/> Mon. <input type="checkbox"/> Tues. <input type="checkbox"/> Wed.	\$ 125 (\$150 late)	\$180 (\$205 late)	_____
Spouse/Companion (Name): _____	\$ 35 (\$ 35 late)	\$ 35 (\$ 35 late)	_____
Children 15 & Over (Names): _____	\$ 25 (\$ 25 late)	\$ 25 (\$ 25 late)	_____
Children 14 & Under (Names): _____	FREE	FREE	_____

*Awards Banquet not included

EVENTS:

	PER PERSON	# OF TICKETS	
FORE! Best-Ball Golf Tournament (Sunday, 8/1)	\$ 80 (\$ 95 late)	_____	_____
Historical Adventures (Monday, 8/2)	\$ 39 (\$ 44 late)	_____	_____
Children 14 and under	\$ 29 (\$ 34 late)	_____	_____
An Evening in Wine Country (Tuesday, 8/3)	\$ 49 (\$ 54 late)	_____	_____
Take Me Out to the Ballgame (Tuesday, 8/3)	\$ 22 (\$ 27 late)	_____	_____
IAMFES Awards Banquet (Wednesday, 8/4)	\$ 40 (\$ 45 late)	_____	_____

TOURS:

Great Lakes and "Motor City" Culture (Sunday, 8/1)	\$ 45 (\$ 51 late)	_____	_____
At Home with the Auto Barons (Monday, 8/2)	\$ 42 (\$ 47 late)	_____	_____
All Things Canadian (Tuesday, 8/3)	\$ 43 (\$ 48 late)	_____	_____

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

TOTAL AMOUNT ENCLOSED _____

(CHECK PAYABLE TO IAMFES — US FUNDS ON US BANK)



International Association of Milk, Food and Environmental Sanitarians

6200 Aurora Avenue, Suite 200W
Des Moines, Iowa 50322-2863, USA
Phone: 800.369.6337; 515.276.3344
Fax: 515.276.8655; E-mail: iamfes@iamfes.org

Credit Card Payments:



Card # _____

Exp. Date _____

Name on Card _____

Signature _____

EXHIBITORS DO NOT USE THIS FORM

Come see the world in October.

WORLDWIDE



FOOD EXPO

OCTOBER 28-31, 1999
McCORMICK PLACE
CHICAGO, IL USA



The largest food technology event of 1999!

Solutions you need to face the future!

- 1,200 exhibitors; a million square feet of space
- 50 educational sessions
- 35,000 industry leaders; more than 150 countries



American Meat
Institute (AMI)



International Association
of Food Industry
Suppliers (IAFIS)



International Dairy
Foods Association (IDFA)



National Fisheries
Institute (NFI)



National Food Processors
Association (NFPA)

Sponsored by

Register Early!

For information or to register visit

www.worldwidefood.com

Have information faxed to you immediately:

703-645-9302

Coming Events

JULY

• **9-16, Rapid Methods and Automation in Microbiology International Workshop XIX**, Manhattan, KS. For scientific content, contact Daniel Y. C. Fung, Director of the Workshop at 785.532.5654; Fax: 785.532.5681; E-mail: dfung@oz.oznet.ksu.edu. For registration information, please see www.dec.ksu.edu/dce/conf/microbiology.

• **20-21, US Poultry & Egg Association's 1999 Hatchery-Breeder Clinic**, Sheraton Colony Square Hotel, Atlanta, GA. Topics will include: motivate and retain your employees, breeder fertility and performance, how to turn fertility into hatch, and get more consistent chick quality. For additional information, contact US Poultry, 1530 Cooledge Road, Tucker, GA 30084-7303; Phone: 770.493.9401; Fax: 703.493.9257; E-mail: seminar@poultryegg.org; Web site: www.poultryegg.org

• **30-31, IAMFES 86th Annual Meeting Workshop**, Dearborn, MI. Workshop I, "Procedures to Investigate Foodborne Illness," and Workshop II, "An Insider's Look at Microbial Risk Assessment." For additional information see page 444 in this issue of *DFES* or contact IAMFES at 800.369.6337; 515.276.3344; Fax: 515.276.8655; E-mail: jcattanach@iamfes.org.

AUGUST

• **1-4, IAMFES 86th Annual Meeting**, Dearborn, MI at the Hyatt Regency Dearborn. Registration information available in this issue of *DFES* on page 449 or contact Julie Cattanaach at Phone: 800.369.6337; 515.276.3344; Fax: 515.276.8655; E-mail: jcattanach@iamfes.org.

• **9-13, Laboratory Methods in Food Microbiology**, Silliker

Laboratories' Corporate Research Center, South Holland, IL. For additional information, contact Silliker Laboratories, Education Services Dept., 900 Maple Road, Homewood, IL 60430; Phone: 800.829.7879; 708.957.7878; Fax: 708.957.8405.

• **10-11, Pennsylvania Food Processors Association (PFPA) 85th Annual Convention**, Baltimore, MD. For additional information, contact PFPA, 500 N. 3rd St., 9th Floor, Harrisburg, PA 17101-1111; Phone: 717.238.1252; Fax: 717.238.7554.

SEPTEMBER

• **1, Management of Dairy Food Safety, University of Wisconsin-Madison**, Madison, WI. This workshop will address why we keep plants clean, how we keep plants clean, and what to do if a sanitation problem occurs in your plant, including recall programs and legal ramifications. For additional information, contact Mary Thompson, Wisconsin Center for Dairy Research, 1605 Linden Dr., Babcock Hall, Room 241, Madison, WI 53706; Phone: 608.262.2217; Fax: 608.262.1578; Web site: www.cdr.wisc.edu.

• **9-10, 36th Annual Marschall Cheese Seminar**, Santa Clara Convention Center. Co-sponsored by the California Dairy Research Foundation (CDRF) and Rhodia Inc. For more information, contact Jo Ann Sterenberg at 219.264.2557.

• **13-17, Food Micro 99**, Veldhoven - The Netherlands, co-sponsored by IAMFES. Food Micro 99 is primarily for individuals working in food microbiological research and those who are studying food microbiology as well as for professionals responsible for the produc-

tion of (safe) food and authorities involved in safe food regulation. For additional information, contact Dr. Leon Gorris, Unilever Research Laboratorium Vlaardingen, Postbus 114, 3130 AC Vlaardingen, The Netherlands, Phone: 31 10 4605709; Fax: 31 10 4605188; E-mail: leon.gorris@unilever.com.

• **14, International Seminar on Organic Dairy Products**, in association with the 83rd IDF Annual Sessions, Athens, Greece. For additional information, contact National Dairy Committee of Greece, Iera Odos 75 - 118 55 Athens, Greece; Phone: 30 1 5294651; Fax: 30 1 5294616.

• **14-18, 83rd IDF Annual Sessions**, Divani Caravel Hotel, Athens, Greece. For additional information, contact National Dairy Committee of Greece, Iera Odos 75 - 118 55 Athens, Greece; Phone: 30 1 5294651; Fax: 30 1 5294616.

• **16-18, Lead Auditor Training Seminar**, Embassy Suites, St. Louis, MO. For further information, contact Christine VerPlank or Shelia Brewer, ASI Food Safety Consultants, 7625 Page Blvd., St. Louis, MO 63133; Phone: 800.477.0778; Fax: 314.727.2563.

• **19-24, The International Institute of Refrigeration (IIR) 20th International Congress of Refrigeration**, Sydney, Australia. For further information, contact ICR99 Secretariat, 52 Rosslyn St., West Melbourne Vic 3003 Australia; Phone: +61 3 9328 2399; Fax: +61 3 9328 4116; Web site: www.airah.org.au/icr99.

• **22, New York State Association of Milk and Food Sanitarians Affiliate Meeting**, at the Rochester Marriott Throughway Hotel in Rochester, NY. For further information, contact Janene Lucia at 607.255.2892.

• **22-24, Washington Milk and Food Sanitarians Association Affiliate Meeting**, West Coast Wenatchee Center Hotel in Wenatchee, WA. For further information, contact William Brewer at 206.363.5411; E-mail: billbrewer@juno.com.

• **23-24, Wisconsin Association of Milk and Food Sanitarians Affiliate Meeting**. For further information, contact Randy Daggs at 608.266.9376.

OCTOBER

• **4-8, Aseptic Better Process Control Certification School and Aseptic Symposium**, North Caro-

lina State University, Raleigh, NC. For further information, contact Ms. Lisa Gordon at 919.515.2956; Fax: 919.515.7124; E-mail: lisa_gordon@ncsu.edu.

• **6-7, Associated Illinois Milk, Food & Environmental Sanitarians Annual Meeting** at Pere Marquette Hotel in Peoria, IL. For additional information, contact Lee Dressel at 618.654.3438.

• **6-7, Iowa Association of Milk, Food and Environmental Sanitarians, Inc., Affiliate Meeting**. For further information, contact Monica Streicher at 319.933.4521.

• **28-31, Worldwide Food Expo '99**, McCormick Place, Chi-

cago, IL. Register today and see new products, make new contacts, and get the information you need to operate faster. For additional information, contact Worldwide Food Expo '99, 2751 Prosperity Ave., Suite 100, Fairfax, VA 22031 or Phone 703.645.9302; Fax: 703.876.2637; Website: www.worldwidefood.com.

NOVEMBER

• **10-12, FAMFES Annual Retreat**, held at the Florida Leadership Training Center, Haines City, FL. For further information, contact Bill Thornhill at 914.298.7748.



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The Association is comprised of a diverse membership of 2,900 people from 50 nations. IAMFES Members belong to all facets of the food protection arena including: Industry, Government and Academia.

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

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

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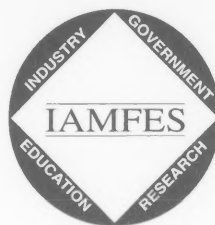
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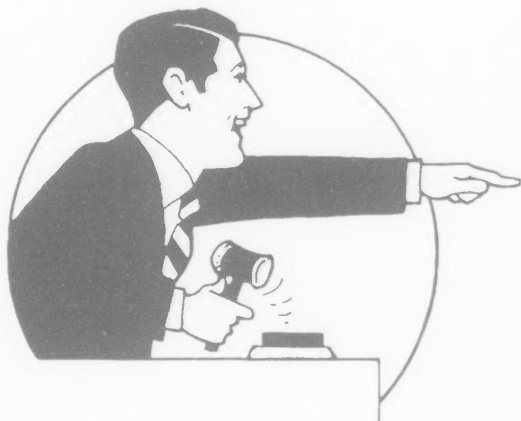
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Why donate an item to the auction?
Last year's auction raised over \$2,000 for the Foundation Fund. Promote your state or organization by donating items now to help the Foundation exceed its goal of \$100,000 in 2000. The Foundation benefits the Ivan Parkin Lecture, the Developing Scientist Competition, the Audiovisual Library and co-sponsorship of the Crumbine Award. It also provides surplus *JFP* and *DFES* journals to developing countries.

Be part of the excitement - Items donated last year included California wine, a Carolina sweet grass basket, food safety videos, Tennessee Smoked Country Ham, a gift certificate from Omaha Steaks International and imported cigars. Donations are accepted from individuals and groups.

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