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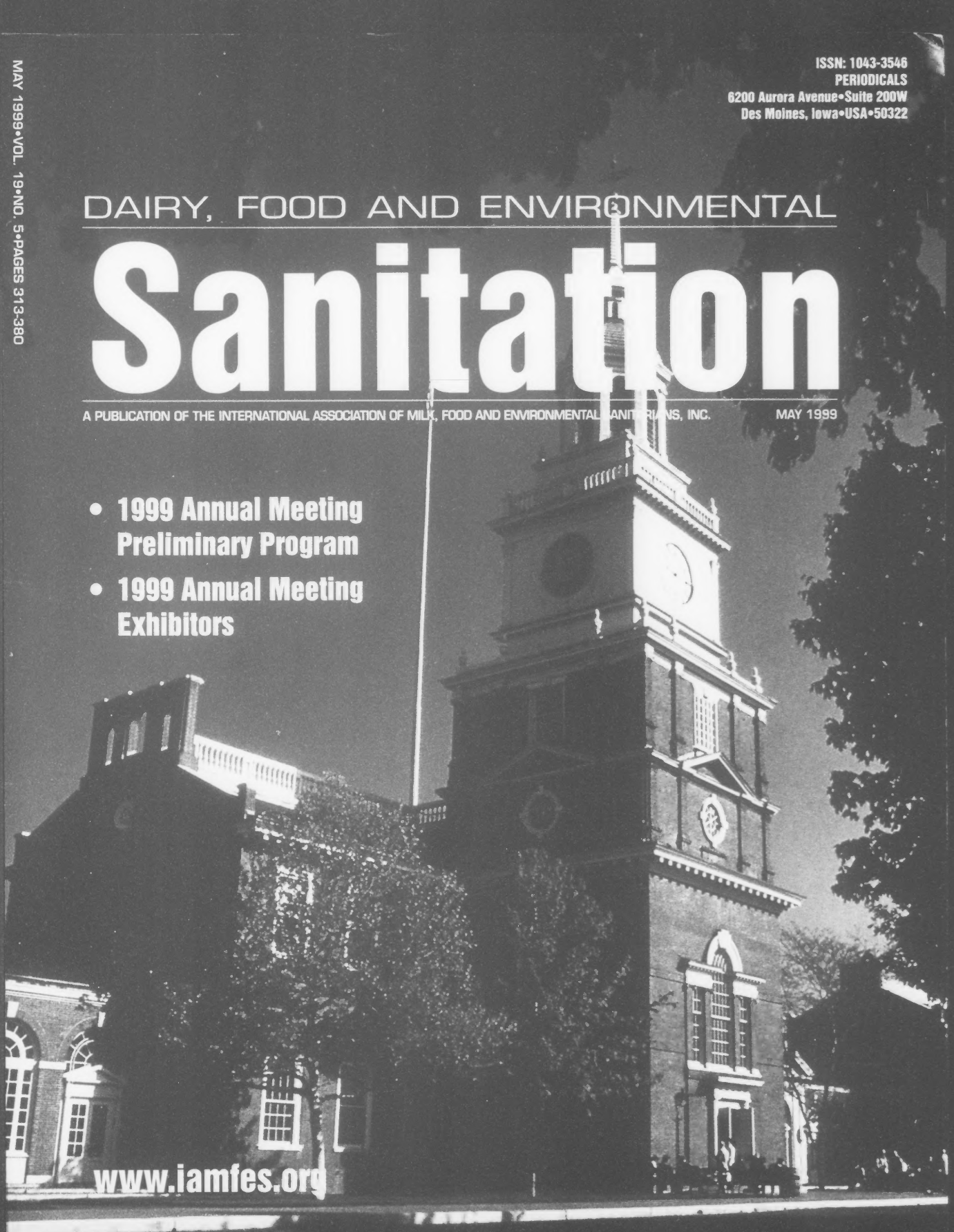
DAIRY, FOOD AND ENVIRONMENTAL

Sanitation

A PUBLICATION OF THE INTERNATIONAL ASSOCIATION OF MILK, FOOD AND ENVIRONMENTAL SANITARIANS, INC. MAY 1999

- **1999 Annual Meeting Preliminary Program**
- **1999 Annual Meeting Exhibitors**



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IAMFES ANNUAL MEETING

Don't Miss Out!

Over 1,100 foremost authorities from industry, academia and government will be attending the world's most comprehensive food safety conference August 1-4, 1999 in Dearborn, Michigan. The is recognized as the leading source for the latest information on advances in protecting the world's food supply.

The Annual Meeting includes over 250 presentations that will allow you to learn about Science-based Criteria for Harmonizing Food Safety Regulations, Globalization of Foodborne Disease, HACCP in Retail Operations, Dairy Plant HACCP Program, and many other issues facing food safety professionals daily.

Network with industry professionals in the IAMFES Exhibit Hall. A visit here will keep you current with the latest products and services available to the food safety industry. Expect displays of testing materials, sanitation products, pest control and more!

Plan now to attend the world's leading food safety conference—the

Call today for registration information...
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E-mail: iamfes@iamfes.org; or visit our Web site: www.iamfes.org; for the latest program information.

August 1–4, 1999
Dearborn, Michigan

Advancing Food Safety Worldwide

ABOUT THE COVER...

Henry Ford Museum photo courtesy of the Metropolitan Detroit Convention & Visitors Bureau.

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Articles

Association News

Departments

Extras

DONATE AN ITEM TO THE FOUNDATION FUND SILENT AUCTION

The Second Annual Foundation Fund Silent Auction will be held at the IAMFES 86th Annual Meeting in Dearborn, Michigan, August 1-4, 1999.

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.

Here's how it works – If you would like to donate an item, complete the accompanying form and return it to the IAMFES office. A listing of auction items and donors will be included in the Annual Meeting Program and Abstract Book.

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IAMFES Annual Meetings

1999

August 1-4

Hyatt Regency Dearborn

Dearborn, Michigan

2000

August 6-9

Hilton Atlanta and Towers

Atlanta, Georgia

2001

August 5-8

Hilton Minneapolis and Towers

Minneapolis, Minnesota

DAIRY, FOOD AND ENVIRONMENTAL

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"The mission of IAMFES is to provide food safety professionals worldwide with a forum to exchange information on protecting the food supply."

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VIEWS

FROM YOUR PRESIDENT

By ROBERT E. BRACKETT
IAMFES President

"The 1999 Annual Meeting Program: The best is getting even better!"

One of the great things about serving on IAMFES committees is that you are often able to get previews of upcoming events. Nowhere is this benefit more evident than with the Program Committee. At the winter Program Committee meeting, committee members review both submitted abstracts as well as symposia. Although this is often a daunting and time-consuming process, committee members get a foretaste preview of what the technical program will contain at the Annual Meeting. As interesting as it is to see the great presentations in their submitted form, the final program is always even more exciting. The technical session promises to be one of the best ever.

A quick glance at the program will reveal that virtually every contemporary food safety issue will be addressed at the upcoming meeting. The following list provides examples of especially timely topics:

• **Global trade** – Two symposia addressing this issue will be presented. The first symposium will focus on the globalization of foodborne disease. Topics will include types of diseases involved, trade issues, and prevention strategies. The second symposium addresses harmonizing food safety regulations. The topics to be addressed in this symposium will range from discussions of the scientific basis of standards, to the issue of equivalence in inspections for international trade. Not only do these symposia address important current issues confronting the food industry and regulatory agencies, but they underscore IAMFES' more international scope.

• ***Listeria monocytogenes*** – *Listeria monocytogenes* has once again surfaced as both a safety and regulatory issue for the food industry. Only this time, it has also attracted wide media attention and engendered broad consumer awareness. Over 20 oral or poster presentations dealing with aspects ranging from methodology to regulations will be presented during the meeting. In addition, a special symposium analyzing the circumstances surrounding the widely publicized recent meat-borne listeriosis outbreak will be presented at our general session.

• **Risk assessment** – Quantitative risk assessment is becoming an important tool in setting both research and regulatory priorities. A whole symposium will be specifically dedicated to USDA's risk assessment for *E. coli* O157:H7 in ground beef. This symposium is somewhat unique in that it will be presented in a "farm-to-fork" approach addressing production, preparation, and communication issues.

• **HACCP** – This year, the technical session will contain two symposia focusing on the Hazard Analysis Critical Control Points (HACCP) system. The first will address HACCP in retail operations and the second will extensively discuss the USDA HACCP implementation for meat and poultry products.

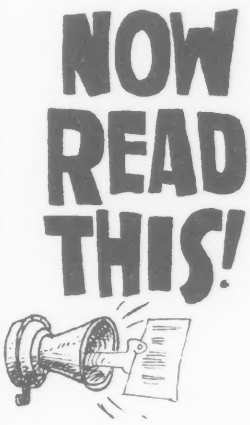
• **Produce safety** – For years, fresh produce was largely ignored as a potential source of foodborne illness. However, several outbreaks of foodborne illness in recent years have brought produce safety to the forefront. Two symposia dealing with different aspects of produce safety will be presented. The first will address the broad issues affecting produce safety, including a review of outbreaks, risk assessment, and various production and processing aspects. The second more narrowly focused symposium will specifically address the role of water and manure in the microbiological safety of fresh produce.

• **Animal waste management** – Animal waste is becoming an increasingly troublesome problem for the food industry. Consequently, this issue has

become an important topic of discussion for anyone interested in assuring food safety. In addition to the symposium listed above focusing on produce safety, a separate symposium looking at animal waste management and its relationship to food safety will be presented.

Of course, these are just a sampling of the many interesting topics that will be addressed in the technical sessions. As always, presentations will provide both results of cutting-edge basic research as well as applied research. You may also find it interesting to note that the presenters are as diverse as the topics, representing over 17 countries from every continent. Meeting and interacting with these individuals is an invaluable way to get new ideas and share experiences.

Our IAMFES Annual Meetings have gained an international reputation for being the most comprehensive professional association conference dealing with food safety and related issues. This year's meeting is shaping up to be one of the best ever. Don't miss it!



What Members are Saying:

John Bruhn, Director – University of California-Davis, Dairy Research & Information Center

"I certainly support the name selected! The change to an association name that more correctly reflects the programs, activities, and membership co-positions is important."

Maribeth Rasmussen, Assistant Microbiologist – Cargill Central Research

"I think the new name reflects more of what the association is than the old acronym. What a way to start the new millennium."

Frank Yiannas, Manager of Environmental Health – Walt Disney World

"I strongly support changing the name of IAMFES – the new name would not only better reflect our mission, but also our Membership."

Robert Marshall, Professor – University of Missouri

"I am elated that IAMFES is attempting to get the name of the organization changed. Thanks for the leadership in the name change."

Ruff Lowman, Research Coordinator – Canadian Food Inspection Agency

"Just read your commentary on the change to International Association for Food Protection– makes perfect sense to a new Member."

Douglas L. Marshall, Associate Professor – Mississippi State University, Department of Food Science & Technology

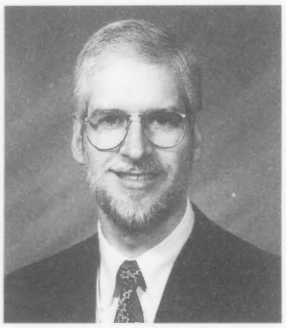
"I would gladly support a change to IAFP!"

In addition, the new name has been endorsed by the *New York State Association of Milk & Food Sanitarians* and the *Ontario Food Protection Association.*

International Association for Food Protection

COMMENTARY

FROM THE EXECUTIVE DIRECTOR



By DAVID W. THARP
IAMFES Executive Director

"IAMFES wants to be your source for up-to-date information"

The IAMFES 86th Annual Meeting will be held August 1st through the 4th in Dearborn, Michigan where over 1,300 food safety professionals are expected to gather with the purpose of sharing the latest scientific information on protecting the food supply. Advances are made daily in food science and food safety; IAMFES wants to be your source for up-to-date information and we are committed to continue providing THE forum for food safety professionals worldwide to exchange information on protecting the food supply. We strive to achieve this goal through our monthly publications, *Dairy, Food and Environmental Sanitation* and the *Journal of Food Protection*, by providing audiovisual training media for Member use, and investigation manuals for rodent-borne, waterborne and foodborne disease and, of course, though presentations and networking opportunities at the Annual Meeting.

I want to further discuss the Annual Meeting and bring to your attention the vital link between the IAMFES Foundation and our Annual Meeting. This year at our Annual Meeting, we will see more than 240 presentations over the course of the three-day meeting. It is certainly rewarding to see what the combined efforts of so many people can produce. The coordination of scheduling for these presentations is mind boggling, but communication among our office, the Program Committee, the session convenors and the presenters begins literally a year in advance of the meeting. I want to commend everyone who has a part in this important process. Because of what you do, others benefit immensely. This will be my 7th IAMFES Annual Meeting and each year it continues to amaze me how many people come together to make our meeting the ONE meeting that food safety professionals MUST attend!

We are fortunate to have many great financial supporters for the Annual Meeting that help us in many ways. Companies and organizations come forth to support awards, events, and refreshments along with travel support for presenters at our Annual Meeting. One sponsor that deserves special mention is the IAMFES Foundation. The Foundation provides assistance for educational services year-round to IAMFES. Your contribution to the IAMFES Foundation will help support the Audiovisual Library of training videotapes, co-sponsorship of the Crumbine Award, and shipment of surplus journals to developing countries. At the Annual Meeting, the IAMFES Foundation supports the Developing Scientist Competition, the Ivan Parkin Lecture, and travel support for presenters of pertinent, timely, scientific information.

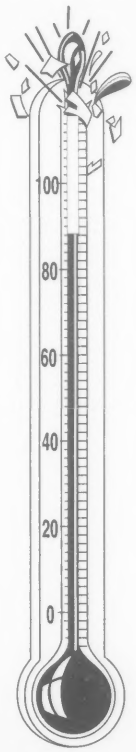
This year, the Foundation will sponsor its Second Annual Silent Auction during the Annual Meeting. We have already received commitments from many IAMFES Affiliate Associations and companies willing to donate wonderful items to the Foundation's Auction. Please see page 315 for additional

information or call Lisa Hovey at the IAMFES office. The California Association of Dairy & Milk Sanitarians (CADMS) donated a case of California wine and challenged other Affiliates to match or exceed their donation. A little "friendly competition" is always welcome!

In addition to the wine, the California Affiliate will present a check to the Foundation in the amount of $1,000 to help the Foundation achieve its goal of reaching $100,000 in 2000! With this commitment, CADMS also challenged other Affiliates of IAMFES and supporting organizations to match their pledge. Wouldn't it be outstanding if multiple entities came forward with contributions to allow the work of the Foundation to continue?

The Foundation has accumulated over $80,000 towards its goal. Many Members have contributed $5, $10, $20, $50 on up to $500. These amounts have been received from individual Members. Just think what may be possible from companies and organizations! Any and all contributions are welcome, so please consider supporting the IAMFES Foundation with your contribution and by attending the Silent Auction at this year's Annual Meeting! We are looking forward to building the financial health of the IAMFES Foundation with your help. We also look forward to seeing you in Dearborn this August!

$100,000
in 2000



ANNOUNCING...

An IAMFES Foundation Fund Challenge

Thank You!
CADMS

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 $100,00 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.

Dairy, Food and Environmental Sanitation, Vol. 19, No. 5, Pages 326-329

Cooling Gallon Containers of Food in a Commercial Walk-in Refrigerator

O. Peter Snyder, Jr.

SUMMARY

Many food items or ingredients used in preparing ready-to-eat food items are processed, jarred (in gallon containers), and canned (in number 10 cans) foods that are shelf-stable at ambient temperatures until opened. When cold, ready-to-eat food items are prepared for retail foodservice operations, major food ingredients should be precooled to 41°F (5°C) or less to comply with the FDA 1993, 1995, and 1997 Food Codes' recommendation on holding and storing cold food items. Furthermore, precooling major ingredients provides a means of slowing or inhibiting the growth of pathogenic bacteria, thus preventing foodborne illness. This report describes the cooling of mayonnaise in a 1-gallon plastic jar and tapioca pudding in a #10 metal can in a standard, commercial walk-in refrigerator. The data collected and plotted represent typical cooling of processed, shelf-stable food from a room temperature of 70 to 41°F (21 to 5°C) in approximately 8 hours. By extrapolation of the data, cooling times can be calculated for similar-sized containers of hot food. For example, the amount of time for cooling 1 gallon of soup or beef stew in containers of similar dimensions from 140 to 41°F (60 to 5°C) can be determined.

INTRODUCTION

FDA Food Codes of 1993, 1995 and 1997 *(1, 2, 3)* recommend that cold, ready-to-eat food items be maintained at a temperature of 41°F (5°C) or less. Many items used in foodservice facilities are canned or jarred, processed foods that, when left unopened, are shelf-stable and can be stored at ambient temperature. However, when containers of ready-to-eat, shelf-stable food are opened directly after being removed from ambient temperature storage areas, the temperature of the contents is that of the surrounding environment, [e.g., 70 to 85°F (21 to 29°C)]. Therefore, when these items are served or are used in the preparation of cold food combinations, they should be cooled before being prepared, served, or displayed, in order to comply with FDA recommendations for holding cold foods and to satisfy customer quality expectations for cold food.

If all ingredients used in the preparation of cold food items are precooled to <50°F (10°C) [e.g., to 41°F (5°C)], the growth of pathogenic bacteria such as *Staphylococcus aureus* and *Salmonella* spp. can be minimized or controlled *(7, 8)*. For example, if pre-cooled ingredients such as canned and fresh produce items or cooked pastas, rice, and potatoes are used in the preparation of mixed salads, the potential hazard for toxin production by *S. aureus* is reduced or eliminated, because this

TABLE 1. Data from cooling of mayonnaise and tapioca in a commercial walk-in refrigerator

Time (h)	Mayonnaise Temp. (°F)	Tapioca Temp. (°F)	Cold Air Temp. (°F)	Mayo. Temp. - Cold Air Temp. (°F)	Tapioca Temp.- Cold Air Temp. (°F)
0.0	75.0	73.0	34.0	41.0	39.0
0.5	71.2	68.7	34.0	37.2	34.7
1.0	68.2	65.4	34.0	34.2	31.4
1.5	65.7	62.3	34.7	31.0	27.6
2.0	62.5	59.3	34.5	28.0	24.8
2.5	59.5	56.5	34.0	25.5	22.5
3.0	57.5	55.1	34.5	23.0	20.6
3.5	54.3	52.3	34.0	20.3	18.3
4.0	51.8	50.0	34.0	17.8	16.0
4.5	50.1	48.5	34.0	16.1	14.5
5.0	48.1	46.7	34.0	14.1	12.7
5.5	46.8	45.5	34.0	12.8	11.5
6.0	45.2	44.2	34.0	11.2	10.2
6.5	43.8	43.0	34.1	9.7	8.9
7.0	42.5	42.0	33.6	8.9	8.4

pathogen does not produce toxin at temperatures below 50°F (10°C) *(9)*. When the temperature of salad ingredients is maintained below 50°F (10°C) during preparation and is then continuously cooled to less than 41°F (5°C) after preparation, the food preparer can safely use clean, washed hands to mix 5- to -10-gallon volumes of salad. There should be no risk of *S. aureus* toxin production as a result of the presence and growth of the small number of *S. aureus* from the food preparer's hands that may contaminate the salad.

The risk of production of toxin by *S. aureus* and growth of *Salmonella* spp. is further reduced by acetic and/or citric acid in salad dressings, mayonnaise, or some other acid-containing ingredient, because *S. aureus* does not produce toxin at pH below 5.15 *(6)*.

When canned or jarred foods such as canned fruits and vegetables, tuna, salad dressings, and mayonnaise are used in the preparation of combination foods that will require storage or display at refrigeration temperatures of 41°F (5°C) or less, it is beneficial for foodservice personnel to cool jars or cans of these items in advance of preparation and service. Therefore, foodservice personnel should know approximately how much time will be required for 1-gallon jars of food, and number 10 (#10) cans of food to cool to 41°F (5°C) in a standard, commercial walk-in refrigerator. Use of these data will enable foodservice personnel to allow sufficient cooling time for products. The allowance of adequate time for cooling large jars and cans of prepared, ready-to-eat food items can be used as a control point in the production of cold, ready-to-eat food items that are safe, as well as a way of obtaining proper temperatures for compliance with food codes.

METHODS

A standard, commercial walk-in refrigerator at a restaurant in St. Paul, Minnesota was used for this experiment. The airflow around the food in this refrigeration unit was approximately 50 feet per minute (fpm).

To measure food temperature, a type K, 30-gauge chromal aluminal thermocouple was fastened to a 1/8-inch diameter wooden dowel. The dowel was positioned so that the thermocouple was in the middle of a 1-gallon plastic jar of mayonnaise (6 inches in diameter and 9 inches high). A second dowel with an attached thermocouple was placed in

Figure 1. Position of 1-gallon jar and #10 can on rack in walk-in refrigerator

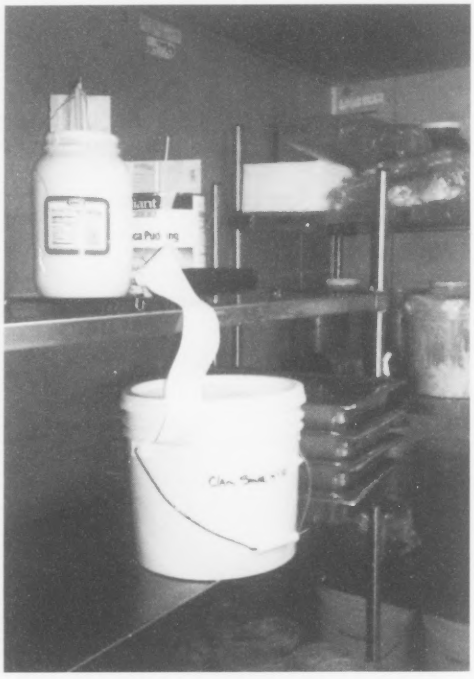


Figure 2. This photograph shows how wooden blocks fastened to the tops of the containers were used to hold thermocouples attached to wooden dowels vertically in place

the center of a #10 can of tapioca pudding (7 inches in diameter and 6 1/2 inches high). The containers of mayonnaise and tapioca pudding were placed on a rack in the refrigeration unit in order to ensure that there was airflow underneath as well as around the containers and thus, to allow uniform heat removal from all surfaces.

Figure 1 shows the position of the jar of mayonnaise and can of tapioca pudding on the shelf in the refrigerator. Figure 2 shows the wooden blocks that were used to stabilize the dowels to which the 30-gauge thermocouples were fastened in the geometric center of each container. An electronic datalogger was used to collect data. Air temperature and food temperatures were recorded simultaneously every 10 minutes during the cooling period. The data were analyzed according to the method described by Pflug and Blaisdell *(5)*.

RESULTS

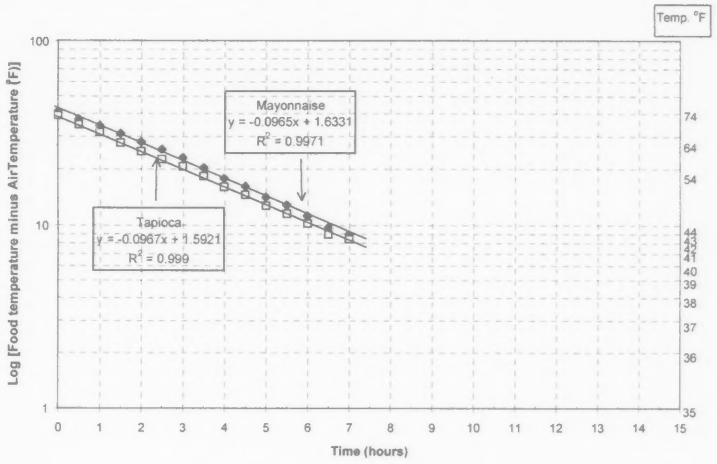
Collected data are shown in Table 1. Figure 3 is the logarithmic plot of the center food temperature of the two products, minus air temperature, during the cooling cycle. The slopes of the cooling curves are essentially identical. The temperature of the mayonnaise in the gallon jar was, initially, approximately 2°F (1.1°C) above the temperature of the tapioca pudding in the #10 can and remained so during the entire cooling cycle. The measurements were stopped after 7 hours, when the temperatures had reached about 42°F (5.6°C). The actual amount of time required to reach 41°F (5°C) would probably have been 30 to 60 minutes more, or 7 1/2 to 8 hours. (See Table 1 and Fig. 3.)

The mean circulating air temperature in the cooler was 34.1°F (1.1°C) for the experiment's duration of approximately 7 hours. Because of the exponential nature of the cooling curve, the initial cooling plot is not sensitive to a 2- to -3°F (1.1 - to -1.7°C) variance in refrigerator temperature. Whether the refrigerator temperature is at 38 or 34°F (3.3 or 1.1°C) is not significant to the driving force of cooling when the temperature difference is 100°F (55°C). However, near the end of the cooling cycle, when the temperature difference between the center of the product and the driving force (i.e., circulating air temperature) is in the range of 5°F (2.8°C), circulating air temperature constancy becomes critical. The effective air temperature blowing across the product toward the end of the experiment was about 34°F (1.1°C).

DISCUSSION

A plot of the data from this experiment shows that in a typical foodservice walk-in refrigerator with standard, low-airflow conditions of about 50 fpm, a 1-gallon plastic container of mayonnaise and a #10 can

Figure 3. Cooling mayonnaise (1-gallon plastic jar) and tapioca pudding (#10 can)



Mayonnaise
$y = -0.0965x + 1.6331$
$R^2 = 0.9971$

Example
$y = -0.0965 (3 h) + 1.6331$
$y = [-0.29 + 1.6331] = 1.3431$

Log 1.3431 = 22.03°F

Tapioca
$y = -0.0967x + 1.5921$
$R^2 = 0.999$

Example
$y = -0.0967 (3 h) + 1.5921$
$y = [-0.2901 + 1.5921] = 1.302$

Log 1.302 = 20.04°F

of tapioca pudding can be cooled from 70 to 41°F (21 to 5°C) in approximately 8 hours. These data suggest, therefore, that unopened jars of mayonnaise and/or other jars or cans of ingredients should be put into a refrigerator at least 8 hours prior to use. This practice cools the food sufficiently to ensure compliance with regulatory recommendations if these items are placed in refrigerated display for a period of more than 4 hours. Use of cold ingredients for the preparation of salads and sandwich fillings decreases the risk of *S. aureus* or *Salmonella* spp. multiplication. The temperature of these products should be low enough to assure that there will be little or no temperature increase in the temperature when the product is opened and used for immediate service or added to a salad or other cold food combination.

These data can be extrapolated to predict the time required for cooling food from 140 to 41°F (60 to 5°C) in these two types of containers. The estimated time required to cool food from 140 to 41°F (60 to 5°C) is 11 hours, and approximately 11 hours 30 minutes would be required to cool food to 40°F (4.4°C), assuming the same driving force air temperature of 34°F (1.1°C) and an airflow of 50 fpm. The FDA 1997 Food Code *(3)* recommends cooling food to 41°F (5°C) in less than 6 hours [from 140°F (60°C) to 70°F (21°C) within 2 hours and 70°F (21°C) to 41°F (5°C) or below within 4 hours]. However, research by Juneja et al. *(4)*, indicates that if food is cooled continuously from 130°F (54.4°C) to 45°F (7.2°C) within 15 hours, there will be minimal spore outgrowth of *Clostridium perfringens*.

CONCLUSION

Mayonnaise in a 1-gallon plastic jar and tapioca pudding in a #10 metal can were used to represent typical cooling of unopened containers of processed, shelf-stable food from a temperature of 70 to 41°F (21 to 5°C). The time required to accomplish this amount of cooling in a standard refrigeration unit with airflow of 50 fpm was approximately 8 hours.

These cooling data can also be applied to the cooling of other foods in the same or similar types of containers. For example, the data can be extrapolated to determine continuous cooling times from 140 to 41°F (60 to 5°C) for 1 gallon of soup or beef stew in containers of similar dimensions.

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Laboratory Accreditation: Is It Needed and Can It be Standardized?

Russell S. Flowers and Richard B. Smittle

SUMMARY

The Pathogen Reduction Program, HACCP regulations, and the FDA Food Safety Initiatives have all increased the need for credible microbiological testing in government, industry, and independent laboratories. Accreditation of laboratories with recognized quality systems in which standard operating systems, validated methods, and a demonstrateable proficiency to a method play critical roles is a proven approach. Our experience at Silliker Laboratories shows that following explicit operating procedures, methods, quality control procedures, training programs, and proficiency testing protocols leads to more precise and accurate results. The best laboratory quality model is the one found in the ISO Guides 25, 43, and 58, coupled with the ALACC/ FLAWG microbiology criteria. A laboratory accreditation system is proposed that recognizes documentation guidelines, accreditation criteria, proficiency testing, accreditor approval, and proficiency materials provider approval. At present, the cost for accreditation, excluding preparation of the quality systems, ranges from $5200 to $14200. By use of our quality system, the proportion of quality tests to sample tests can vary from 5% to 20%, depending on the size of the laboratory.

INTRODUCTION

Microbiological criteria are set between buyer and seller and by regulatory agencies. Specifications for quality are generally determined by the buyer and include safety criteria in compliance with standards promulgated by the USDA, FDA, and state and local governments. Testing to ensure compliance is done according to specific methods and sampling plans. Where the seller or a third-party testing laboratory does testing, the buyer usually audits the laboratory and/or evaluates the laboratory with proficiency test materials. Both the Agriculture Marketing Service (AMS) and the Food Safety Inspection Service (FSIS) of the USDA until recently employed a similar audit/ performance test system to evaluate laboratories testing regulatory samples for *Salmonella* and *Listeria*.

With the recent implementation of Pathogen Reduction and HACCP regulations and FDA Food Safety Initiatives, microbiological testing has assumed increased importance. Both systems will place unprecedented reliance on microbiological testing to assess process control and regulatory compliance and will result in increased microbiological testing in industry and government laboratories. As a consequence, both government and industry need to maximize the capacity for, and

TABLE 1. Percent coefficient of variation on quantitative microbiology proficiency sample results for Silliker Laboratories and outside laboratories (1995 – 1996) *(10)*

	Percent Coefficient of Variation Repeatability	Percent Coefficient of Variation Reproducibility
Silliker (b)	4.1	8.6
Outside (a)	8.8	21.3

(a) 13-40 laboratories (1,933 total population)

(b) 12-14 laboratories (1,182 total population)

TABLE 2. Percent coefficient of variations on proficiency from Benchmark Laboratories (BL) and Silliker Laboratories (SL) by test (1995 – 1996 , 7 quarters) *(10)*

Procedure	Repeatability		Reproducibility	
	BL[a]	SL[b]	BL[a]	
SL[b]				
E. coli MPN	4.3	7.2	29.3	19.6
APC	2.0	1.8	3.8	3.3
C.P Staph.	2.3	1.0	24.7	5.3 *
Mold	13.9	1.0 **	24.7	3.5 **
Yeast	10.4	0.7 **	18.5	1.1 **
Coliform (VRB)	3.0	2.2	6.4	4.5 +
Coliform MPN	4.0	3.7	10.6	4.8

a. Benchmark Laboratories, (13-40 laboratories)

b. Silliker Laboratories, (12-14 laboratories)
+= 90% statistical significance
* = 95% statistical significance
** = 99% statistical significance

credibility of, laboratory testing of both official samples to meet regulatory requirements and routine samples for manufacturing control monitoring and public safety assurance purposes.

ACCREDITATION AND ACCURATE, RELIABLE RESULTS

A laboratory accreditation system is needed to assess the quality of data and to minimize variation between laboratories and the potential for producing faulty data. During the past seven years, Silliker Laboratories has concentrated on standardizing laboratory operations throughout its organization. Quality systems have been standardized and documented in Standard Operating Procedures (SOPs), Standard Data Recording Forms, and detailed written methods that comply with recognized standard methods but provide additional detail designed to reduce variation among analysts and laboratories.

An essential part of this quality system is a monthly performance test program with a corrective action system. All Silliker Laboratories participate in a monthly performance-testing program. In addition, on a quarterly basis, approximately 70 food industry laboratories participate in the program. Each laboratory, on a quarterly basis, receives four samples for the following analyses: aerobic plate count, coagulase positive staphylococci count, yeast and mold count, coliform and *Escherichia coli* count or MPN, *Listeria*/25g and *Salmonella*/25g. Results are analyzed statistically to evaluate the proficiency of the participating laboratories. Repeatability-within-laboratory variance (precision) and reproducibility-among-laboratory variance (accuracy) are calculated. Table 1 shows that the percent coefficient of variation for both repeatability and reproducibility are smaller for the Silliker Laboratories, probably as a result of all their operating under the same SOPs, in contrast to the industry laboratories, which operate under different systems *(10)*. However, further analysis by test method (Table 2) shows that standardized operating systems are not the only answer to reducing vari-

TABLE 3. Examples of specific criteria for accreditation of food microbiology laboratories

ISO Guide 25 Section 5	Specific criteria from ALACC microbiology criteria
Quality system, audit & review	Daily check samples for accredited tests - Quantitative - charts - Qualitative - positive controls Proficiency Testing per annum for accredited tests

ability *(10)*. It appears that some methods are much more variable than others because of their larger percent coefficient of variation values e.g., for the coagulase positive, staphylococci count, yeast and mold count, and coliform MPN procedures. Because of our standardized SOPs that emphasize training and performance in proficiency testing for specific methods and because of our detailed methods that include quality control procedures, we can almost consistently demonstrate less variation than outside laboratories. Silliker Laboratories demonstrated smaller percent coefficient of variation on both reproducibility and repeatability on all tests except that for MPN *E. coli*. However, statistically significant differences were observed only with regard to yeast, mold and coagulase positive staphylococcus tests. These data clearly demonstrate the problem of comparing test results from multiple laboratories operating under different SOPs and quality systems and emphasize the need for accredited standardized quality systems and procedures.

ISO GUIDES AND MICROBIOLOGICAL CRITERIA

Accurate and reliable test results are the ultimate goal throughout the food industry. Key to achieving this goal is the use of standardized quality practices and validated methods, which is the objective of laboratory accreditation programs. While accreditation does not guarantee the results, it certainly provides the systems necessary for consistently producing accurate and reliable results. It is desirable that any system adopted by the food industry be consistent with international guidelines, e.g., ISO Guide 25 *(5)*, 43 *(6, 7)*, and 58 *(8)*, and recognized by regulatory agencies (USDA, FDA) to enhance national and international prestige. The quality systems in ISO/IEC Guide 25-1990 *(5)* are general and can be applied to many fields of testing. Most important, they lay out a system for specifically addressing a demonstration of a given level of competency in a specific method. However, because the Guide 25 Systems are general, specific criteria must be developed for microbiology laboratories. In Europe, this has been addressed in the Eurachem/EAL Accreditation for Laboratories Performing Microbiological Testing *(2)* and ISO 7218 *(4)*. Recently, the AOAC International ALACC has developed accreditation criteria in a document, AOAC International Accreditation Criteria for Laboratories Performing Food Microbiological Testing, Dec. 17, 1998 *(1)* modified from the Food Laboratory Accreditation Working Group's (FLAWG) United States Accreditation Criteria for Laboratories Performing Food Microbiological Testing, Nov. 17, 1997 *(9)*. Selected examples of specific criteria proposed by the ALACC and FLAWG are found in Table 3 *(1, 9)* which shows the level of detail needed for accreditation. The laboratory must run a positive control with each test method and participate in a proficiency test program for each accredited method at least once a year. It is our practice at Silliker Laboratories to participate each month in a proficiency test program that includes all accredited methods and to participate in a quarterly AOAC International program that includes all the common microbiological methods. FLAWG was a group of United States scientists from industry, regulatory agencies, and service laboratories concerned with the accuracy and reliability of food testing who wanted a consistent accreditation process developed that meets national and international standards. ALACC has a similar composition and the same goals but has a more open forum for comments and international participation. Many trading partners have national accreditation systems; among them are SCC, Standards Council of Canada; UKAS (NAMAS), United Kingdom Accreditation Service (National Measurement Accreditation Service); NATA, National Association of Testing Authorities (Australia); TELARC, Testing Laboratory Registration Council (New Zealand); RNE, (France); STERLAB, (Netherlands); APLAC, Asia Pacific Laboratory Accreditation Cooperation. Obviously, an international system of laboratory accreditation will minimize discrepancies and disputes between trading partners and within the United States as well.

PROPOSED ACCREDITATION SYSTEM

A laboratory accreditation system in the United States must include guidelines for accreditation, an approval system for accreditations, and a means for producing proficiency materials. A proposal for laboratory accreditation is as follows:

Laboratory accreditation

- Quality document guidelines in ISO/IEC Guide 25-1990 *(5)*: All laboratory documentation is prepared by the laboratory and must be consistent with the requirements of the ISO Guide 25 *(5)* and the ALACC criteria *(1)*.

TABLE 4. Estimated costs of food microbiology laboratory accreditation (10)

- Initial Accreditation - $3,000 - $8,000 / lab
- Annual Maintenance - $2,000 - $5,000 / lab *
- Proficiency Samples - $800 - $1,200

*Additional costs could be incurred if laboratory is put on provisional status requiring additional inspection and/or proficiency tests.

TABLE 5. Percent quality tests of total tests in different size Silliker Laboratories in 1996 (10)*

Laboratory Tests / Year	% Quality Tests / Total Tests
> 400,000	5
200,000 - 400,000	6 - 8
100,000 - 199,000	10 - 15
< 100,000	20 - 30

* Includes: proficiency samples, daily checks, positive and negative controls, etc.

- Private Sector accreditation, e.g., American Association of Laboratory Accreditation (A2LA) and National Sanitation Foundation (NSF): The laboratory accreditor is responsible for assessing each laboratory's quality systems according to the ISO Guide 25 *(5)* and ALACC criteria *(1)* for conformance.
- Specific criteria for a food microbiological testing laboratory; AOAC International Accreditation Criteria for Laboratories Performing Food Microbiological Testing *(1)*, formerly Microbiology FLAWG criteria *(9)*: Criteria must be developed to standardize the laboratory quality systems for all laboratories.
- Required proficiency testing specific for test and method (per year): Proficiency testing materials and programs that are in compliance with ISO Guide 43 *(6, 7)* must be available for all accredited tests. These can be bought from proficiency testing materials providers such as AOAC International and/or they can be developed by the laboratory.

Accreditation approval

- Approved according to ISO Guide 58 - 1993 *(8)*: All accreditors must be in compliance with this guideline and be nationally and internationally recognized.
- Administrated by National Council for Laboratory Accreditation (NACLA) and/or some national accrediting body: This accrediting body must be nationally and internationally recognized in order to accredit the laboratory accreditors.

Proficiency materials

- Proficiency materials providers approved according to ISO Guide 43 - 1997 *(6, 7)* with adherence to IUPAC, ISO, AOAC harmonized guidelines for analytical chemistry laboratories *(11)*: Although there are no accredited food microbiology proficiency materials providers in the United States at present, those laboratories or services that want to become approved must eventually be in compliance with this guide.

COST OF ACCREDITATION

The estimated cost for a food microbiology laboratory accreditation would be between $5800 and $14200 (Table 4) *(10)*. However, this does not include the cost of writing and implementing a quality system consistent with ISO/IEC Guide 25 - 1990 *(5)*, which is considerably more than the accreditation costs. Within Silliker Laboratories, the percent quality tests ranges from 5% (1 in 20 tests for quality) in our larger laboratories to about 20% (1 in 5 tests for quality) in our small laboratories (Table 5) *(10)*. Regardless of the size of the laboratory, quality control testing represents a significant portion of the cost for accreditation.

CONCLUSION

A laboratory accreditation system will improve the accuracy and reliability of laboratory data whether the system represents industry or regulatory agencies. It will decrease variability between laboratories, thus reducing discrepancies and disputes, and improve trending and benchmarking. There will be increased credibility for all laboratories and the data

they produce, whether by industry, regulatory agencies, or international trading partners. Accreditation will greatly improve the industry and government selection process for competent laboratories and for development of reliable microbiological analyses. A national and internationally recognized accreditation system will provide better data for identification of best practices and improved methodology. A laboratory employing "best practices" quality systems would reduce the potential liability associated with faulty laboratory data. Last, employing internationally recognized accreditation schemes will greatly promote fair trade.

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ANNA M. LAMMERDING ELECTED IAMFES SECRETARY

Anna M. Lammerding, Ph.D., 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, she 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. She 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. She 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.

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.

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.

NewMembers

BRAZIL

Lucia Schuller
S. Bernardo do Campo, S. Paulo

CANADA

Kathryn A. Cooper
Guelph Food Technology Centre
Guelph, Ontario

Laurent Laflamme
Barry Callebaut CDA Inc.
St. Hyacinthe, Quebec

Susan Barclay-Pereira
Durham College
Oshawa, Ontario

Kris Rahn
Health Canada
Guelph, Ontario

HUNGARY

Jozsef Farkas
Univ. Horticulture and Food
Industry, Budapest

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New IAMFES Sustaining Member

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UpDates

Walker Stainless Announces Wayne Oliver as V.P. and General Manager of Stationary Products Group

Walker Stainless is pleased to announce Wayne Oliver as V.P. and General Manager for Walker's Stationary Products Group which manufactures stationary tanks and equipment for the food, dairy, beverage, pharmaceutical, cosmetic and chemical industries.

Wayne Oliver was previously with another Carlisle Company, Carlisle Container Manufacturing Company and with Carrier Transi-Cold, a division of Carrier Corporation. Walker has many opportunities to expand market share by aggressively implementing leaner processes throughout the company. As a result, customers will see an improved response to their needs.

Osmonics Promotes Mike Bolton to General Manager of Milwaukee Operations

Osmonics, Inc. announced that Michael P. Bolton will become General Manager of the company's Milwaukee Operations, formerly the Autotrol Company.

Bolton is currently the General Manager of Osmonics' Rockford Operations in Rockford, IL, and will continue to serve in this capacity. As General Manager for both sites, Bolton is responsible for all manufacturing and administrative activities.

"Mike's experience in manufacturing, electronics, and water treatment is admirably broad," Toomey said. "He also brings extensive knowledge of the flow control component business from his years at our Milwaukee Operations. As General Manager at Milwaukee and Rockford, he will help us increase operating efficiencies and find new ways to satisfy our customers in the residential, commercial, and industrial water treatment markets."

Bolton began his career with Osmonics as a project engineer for Milwaukee operations. Later, as an engineer and product manager, he was instrumental in the design of many Autotrol® products available today. He also served as director of technology.

Bolton earned his bachelor's degree in mechanical engineering from the Milwaukee School of Engineering, and he holds an MBA from Keller Graduate School of Management.

Ecolab Names New Marketing Team Members

Ecolab's Food & Beverage division has expanded its marketing team.

Richard Higby has been named Senior Marketing Manager, Meat and Poultry Division. Higby joined Ecolab with the company's acquisition of Vulcan Chemical Technologies' Food & Beverage segment in November.

Kimberly Underwood has joined Ecolab as Senior Marketing Manager, Dairy Division.

Prior to joining Ecolab, Underwood held several senior marketing positions at Nalco Chemical Company during her 13-year tenure there.

New Technical Service Representative at Alfa Laval Flow Inc.

Steve Garrett, of Kenosha, WI, has accepted a position with Alfa Laval Flow Inc. as Technical Service Representative.

Garrett, formerly returns-good coordinator, will provide customers with technical assistance on all products for Alfa Laval Flow Inc. Garrett has been working with the company for nearly five years, part of which was spent in valve assembly.

Vacancies on IAFIS BOD Filled

The International Association of Food Industry Suppliers (IAFIS) has announced that Ivan Larsh, President of Waukesha Cherry-Burrell, and Fred Beer, President of The Deam Company, have accepted positions on the IAFIS Board of Directors.

IAFIS President Charlie Bray announced on February 4th, "Both of these individuals welcome the opportunity to serve and look forward to making their contributions to our new strategic objectives."

The two recent openings on the IAFIS Board of Directors, which were due to the incumbents making industry job changes, were At-Large Director and Packaging Commodity Director positions. Mr. Larsh, who will serve in an At-Large capacity, and Mr. Beer, who will serve in a Packaging Commodity capacity, will complete the unexpired terms in April of 2000, and have the opportunity for re-election to the board.

BISSC Celebrates 50th Anniversary, Elects New Officers

The Baking Industry Sanitation Standards Committee (BISSC), celebrated a milestone in its history of providing 50 years of service to the baking industry (1949 to 1999) at its annual membership meeting in Chicago on February 26, 1999.

Also at its February meeting, the BISSC Board of Directors reelected Sigismondo De Tora and Bill E. Davis as Chairman and Vice Chairman, respectively. Bonnie Sweetman continues both as Secretary-Treasurer and also in providing management and headquarters services to the organization.

Dan Osiedacz Promoted at Fristam Pumps

Fristam Pumps, Inc. is pleased to announce the promotion of Dan Osiedacz to the position of Positive Displacement Pump Product Manager.

In his new assignment Dan will supervise the positive displacement assembly department, provide in-house technical support, and monitor quality, efficiency, schedules, delivery and performance. Additionally he will participate in product development and improvement, coordinate sales orders and monitor inventories.

Dan has a bachelor of science degree from the University of Wisconsin in agricultural engineering/power & machinery and has been with Fristam for over two years.

The Excellence in Science Award for 1998 Presented to Ewen Todd

Dr. Ewen Todd has been presented with the 1998 Excellence in Science Award, which recognizes him as a renowned food microbiologist who has served the Canadian public for more than 30 years. He is being honored for his long-term, sustained contributions to science in the interest of health protection in a variety of different areas. His dedication to duty, and his concern and commitment to assuring the safety of our food supply, lead us to pay tribute.

Dr. Todd earned his bachelor of science (Honors) degree from the University of Glasgow in 1963, and his doctor of philosophy from the same university in 1968. He joined the Food and Drug Directorate in the same year. His original interest in the taxonomy of staphylococci and micrococci stood him in good stead for his attention to detail during his prestigious career with Health Canada, Health Protection Branch (HPB). Some of the steps along the way include Section Head, Methodology/Contaminated Food Section (1971 to present); Chairman, Food Disease Reporting Centre (1976 to present) and Co-Chairman, Botulism Reference Centre (1976 to present).

In his early years, he contributed to the health hazards of barbecued chickens, cheese contamination with *Staphylococcus aureus* and *Salmonella*, the relationship between *S. aureus* thermonuclease and enterotoxin production in cheese, the significance of temperature for microbial growth in foods, the microbiology of frozen cream pies, canned food methodology and post process leakage, and outbreaks of botulism in northern Inuit communities. More recently, he developed methods to detect *E. coli* O157, other verotoxigenic *E. coli* and *Salmonella* in food using antibody and DNA probe techniques with hydrophobic grid membrane filters (HGMF) in collaboration with Dr. Anthony Sharpe in the Bureau. Internationally, Dr. Todd's work is widely recognized. He has contributed to the surveillance of foodborne disease in Canada and other countries, which has led to invitations by the World Health Organization (WHO) and the Pan-American Health Organization (PAHO) to assist them on wide-ranging topics, including emerging pathogens, prevention and control of enterohaemorrhagic *E. coli* infections, and ciguatera control.

In 1997, he advised officials in Cambodia and China on water- and foodborne disease surveillance systems and suggested control measures on behalf of the WHO. He has broken new ground in developing surveillance of food- and waterborne disease in relation to economic impacts. He is a member of a group assembled by the Harvard Medical School which is considering the potential impact of climate change on disease events in the marine environment. He has reported on the illnesses in Canada caused by the seafood toxins, paralytic shellfish poison, diarrhetic shellfish poison, domoic acid, ciguatera, scombroid poison and tetramine, and worked with chemists and inspectors to derive dose responses from outbreaks caused by these agents, and he has estimated their economic impact in Canada.

He is currently developing risk assessments with teams of experts for foodborne pathogens such as *E. coli* O157 in hamburgers, *Salmonella* Enteritidis in eggs and *Vibrio vulnificus* in oysters. His interest has not only been in research but throughout his career has worked with the former HPB regional staff, national and provincial groups like the Canadian Restaurant and Foodservices Association to produce course material, videos and pamphlets on food safety education, and input into federal/provincial/territoral food safety and inspection committees. It is rare to find a scientist who has been recognized for his expertise in so many diverse areas.

Research Leads to Beef Safety Improvements

Congress and the Administration should increase their emphasis on funding aggressive scientific advancements to eliminate *E. coli* O157:H7, according to the National Cattlemen's Beef Association (NCBA). NCBA Chief Executive Officer Charles P. Schroeder told staff members of the House and Senate Agriculture and Appropriations Committees that the beef industry is committed to implementing a $40 million research plan developed by all segments of the industry to further pathogen reduction.

"Beef producers alone have spent more than $6 million since 1994 on *E. coli* O157:H7 research through their national and state checkoff programs. Together with additional millions invested by the packer, retail and foodservice sectors, we have made significant advancements," Schroeder said.

"However, if we are to stay aggressive and move further in overcoming this pathogen, federal funding and public/private partnerships are critical over the next five years to accelerate interventions."

Dr. Gary C. Smith, Professor of Animal Science at Colorado State

University, said that despite costs, the industry has been eager to adopt procedures that improve the safety of the products they sell. "It is estimated that more than 80 percent of the research projects that producers have funded have directly and immediately led to implementation of procedures that increase beef safety," Smith said. "The progress that has occurred in improving beef safety not only includes implementation of research finding, but it also has involved commitment by those in the beef industry to make changes in equipment used, technology implemented and labor forces deployed when such changes could enhance beef safety. There is no question, however, that it's an industry-wide effort often initiated by research funded by beef producers and their checkoff dollars."

For example, Smith said that checkoff-funded research provided the data that resulted in the USDA's approval of High Temperature Vacuuming/Steam Pasteurization, technologies currently being used in plants that harvest more than 90 percent of the fed cattle in the United States. It is estimated that it costs $1.6 million for a steam pasteurization unit and up to 25 people are needed on the processing floor alone to make sure the safe food procedures run smoothly.

Other intervention technologies resulting from producer-funded research include hot water and hot water/organic acid rinses, both of which are recommended interventions in USDA's HACCP meat inspection program. Smith added that despite the costs, packing plants have been eager to adopt procedures that improve safety, just as beef producers have been eager to see that such procedures exist and are used.

"The industry has embraced the concept of using 'multiple hurdle microbiological intervention technologies,' knowing that effects of using such procedures are additive. The more hurdles bacteria encounter, the less likely they are to survive as beef enters the food chain," Smith said. "And making bacteria jump multiple hurdles on the packing plant floor has been successful. It is estimated that 99.9 percent of the bacteria on carcasses is removed or destroyed when multiple hurdle microbiological intervention technology is employed."

Schroeder told the group that if further advancements are to be made, it will take a team effort among the industry, government and academia to maximize beef safety.

Dietary Supplements Now Labeled with More Information

Starting March 23, 1999, consumers will see more complete information on labels of dietary supplement products, including an information panel titled "Supplement Facts," a clear identity statement, and a complete list of ingredients.

The "Supplement Facts" panel will provide information such as the quantity of specific nutrients in vitamin and mineral products, and the part of the plant used in herbal products. It will be similar in format to the "Nutrition Facts" panel that appears on most processed foods.

"Today's action represents yet another step in FDA's continuing work to carry out the provisions of the new dietary supplement law. With this innovative label, consumers will have the information they need to make informed choices across the entire spectrum of dietary supplements," said Jane E. Henney, MD, FDA Commissioner.

Specifically, the "Supplement Facts" panel will show the following: the manufacturer's suggested serving size; information on nutrients when they are present in significant levels, such as vitamins A and C, calcium, iron and sodium, and the percent Daily Value where a reference has been established similar to nutrients listed in the "Nutrition Facts" panel on food labels; and all other dietary ingredients present in the product, including botanicals and amino acids those for which no Daily Value has been established.

Herbal products will be identified by the common or usual name and the part of the plant used to make the supplement (such as root, stem or leaf). If the common or usual name is not listed in Herbs of Commerce, published by the American Herbal Products Association, the Latin binomial name such as Tercoma mollis.HBK or Cecropia obstusifolia Bert. will be listed.

All ingredients in the product will be declared in the ingredient statement or within the "Supplement Facts" panel.

A statement of identity will appear on the front panel of the product label. The statement must use the terms "dietary supplement" or a term identifying the contents of the product, such as "Vitamin C supplement" or "Herbal supplement."

The new labeling rule implements some of the major provisions of the Dietary Supplement Health and Education Act of 1994. The rule was published September 23, 1997, with an effective date of March 23, 1999, giving industry 18 months to comply. Products labeled prior to March 23 can continue to be sold until stocks are depleted. Some companies have already introduced products with the new labels.

"FDA is pleased that industry has responded so positively to this new labeling provision. We've

already seen the labels on many products and expect that consumers will be well served as use of the "Supplement Facts" panels expands to all dietary supplement labels," said Joseph Levitt, Director of FDA's Center for Food Safety and Applied Nutrition.

FDA plans to survey dietary supplement products on the market to check for compliance with the new labeling rules. Also, through a variety of means, FDA will provide consumers with information on how to use the new "Supplement Facts" panels.

Mass Treatment of Humans Who Drank Unpasteurized Milk from Rabid Cows

Rabies is a viral zoonosis that is usually transmitted by the bite of an infected mammal. However, in Massachusetts, two incidents have been reported since 1996 of potential mass exposures to rabies through drinking unpasteurized milk. This report presents the investigations of these two incidents.

Incident 1: On November 12, 1998, the Virology Laboratory of the Massachusetts Department of Public Health (VLMDPH) diagnosed rabies in a 6-year-old Holstein dairy cow from a farm in Worcester County. Further analysis of the cow's brain tissue with monoclonal antibodies revealed the cow was infected with a variant of the rabies virus associated with raccoons in the eastern United States.

The cow had loss of appetite beginning November 4 and hypersalivation beginning November 6. An intestinal obstruction was suspected initially as the cause of illness. However, the cow became ataxic and aggressive and died on November 8.

The cow had been milked 12 times during the week before death. Milk from the cow had been pooled with milk collected from other cows, and an unpasteurized portion was distributed for human consumption. Public health investigations identified 66 persons who drank unpasteurized milk collected from this dairy during October 23-November 8. All 66 received rabies postexposure prophylaxis (PEP). In addition, five persons received PEP because of exposure to the cow's saliva during the 15 days preceding her death. Neither milk nor mammary tissue from the rabid cow was available for examination for the presence of rabies virus.

Incident 2: On November 12, 1996, the VLMDPH diagnosed rabies in a 14-year-old Jersey dairy cow from a different farm in Worcester County. Analysis with monoclonal antibodies revealed the cow was infected with a variant of the rabies virus associated with raccoons in the eastern United States.

The cow developed tenesmus and depression on November 6 and was euthanized on November 10. The cow had been milked during October 26 to November 2. An investigation identified 14 persons who drank unpasteurized milk collected from this cow during this period. All 14 persons received rabies PEP. In addition, four persons received PEP because of exposure to the rabid cow's saliva during the 15 days preceding her death.

Management of mass human exposures to rabid animals requires public health officials to balance knowledge of rabies epidemiology, risk for transmission, and pathogenesis with the perceived risk for death among exposed persons. Because of the nearly 100% case-fatality ratio of human rabies and the virtually complete effectiveness of PEP, many mass exposure incidents prompt administration of rabies immune globulin and vaccine, even if the circumstances do not meet the criteria for exposure (1 to 3).

During 1990 to 1996, CDC received reports of 22 incidents of mass human exposures to rabid or presumed-rabid animals in the United States, resulting in 1908 persons receiving PEP (median: 33 persons per incident). In Massachusetts during 1991 to 1995, the median cost for PEP was $2376 per person, including physician and facility charges. Prolific administration of PEP in response to these incidents strains the availability of rabies biologics, especially human rabies immune globulin, which has a short shelf-life and tightly controlled distribution by the manufacturers.

An average of 150 rabid cattle have been reported to CDC in the United States each year since 1990. In addition to concerns about rabies transmission from animals to humans through bites, rabid livestock raise the potential for foodborne transmission. The National Association of State Public Health Veterinarians recommends against consuming tissues and milk from rabid animals. However, because rabies virus is inactivated by temperatures below those used for cooking and pasteurization, eating cooked meat or drinking pasteurized milk from a rabid animal is not an indication for PEP.

Rabies virus can be transmitted by direct contact with infected material, such as saliva from an animal infected with rabies, and mucous membranes, including the oral and gastric mucosae. In addition to saliva and neural tissue, rabies virus also has been detected in the kidney, prostate, pancreas, and other tissues and body fluids. However, saliva and neural tissue are the primary proven vehicles for rabies virus in naturally occurring cases. Anecdotal reports exist of rabies transmission by ingestion of milk from rabid animals (e.g., from a rabid sheep to a nursing lamb).

In these reports, the more conventional routes (e.g., bite or mucous membrane exposure) could not be completely excluded.

Transmission of rabies virus in unpasteurized milk is theoretically possible. The risk could be defined better if samples of milk and mammary tissue were collected from rabid livestock and assayed for the presence, viability, and infectivity of rabies virus. Regardless of the amount of viable rabies virus that may be shed in cows' milk, the theoretical risk for transmission of rabies from this route can be eliminated if all dairy products are pasteurized before consumption.

President's Council on Food Safety: Assessment of the NAS Report Ensuring Safe Food from Production to Consumption

Americans have one of the world's safest food supplies. This is largely a result of sustained regulatory and education programs along the farm to table continuum as well as surveillance and research efforts. The federal food safety system, comprised of multiple agencies, is authorized by a diverse set of statutes and is supported by numerous key partnerships with state, local, and tribal governments. Together these agencies have created a system that has given US consumers confidence in the safety of their food purchases.

As good as the nation's food safety system is, there is room for improvement. Illnesses and deaths due to contaminated food, while preventable, continue to cause considerable human suffering and economic loss. That is why, at the very beginning of his first term, President Clinton set a course to strengthen the nation's food safety system. Under the President's leadership, surveillance and research have dramatically increased, programs are better coordinated, and regulations are more prevention-oriented and science-based. But this is only the beginning. The Council on Food Safety, with the help of the public, will continue to identify problems and promote solutions.

The Council welcomes the findings and recommendations provided by the National Academy of Sciences in its August 1998 report Ensuring Safe Food from Production to Consumption. This report lays out a clear rationale for a national food safety plan, one that is based on science and risk assessment.

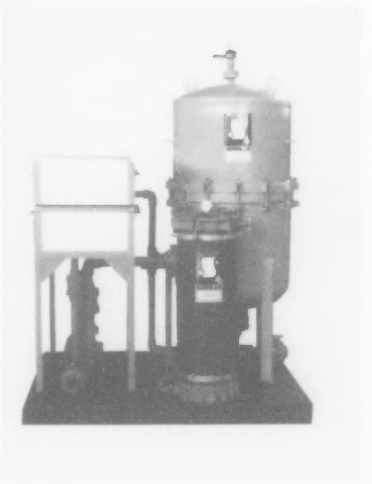
The Council supports NAS recommendation I, which states that the food safety system should be based on science. In its assessment of the NAS report, the Council provides numerous examples in which this is already the case and examples of areas that need to be strengthened.

The Council supports NAS recommendation IIa, which calls for federal statutes to be based on scientifically supportable assessments of risk to public health. In this regard, the Council will conduct a thorough review of existing statutes and determine what can be accomplished with existing regulatory flexibility and what improvements will require statutory changes.

The Council supports NAS recommendation IIb, which calls for the production of a comprehensive national food safety plan. In fact, the development of such a plan is already underway and is one of the primary functions of the Council as specified in Executive Order 13100. One component of the plan will be exploring methods to assess the comparative health risks to the nation's food supply.

The Council supports the goal of NAS recommendation IIIa. Here, the NAS calls for a new statute that establishes a unified framework for food safety programs with a single official with control over all federal food safety resources. The report acknowledges that there may be many organizational approaches to achieving the goal of a "single voice" for federal food safety activities. The Council will conduct an assessment of structural models and other mechanisms that could strengthen the federal food safety system through better coordination, planning, and resource allocation, keeping in mind that the primary goal is food safety and public health.

The Council supports NAS recommendation IIIb. This recommendation argues that agencies should have the legal authority and other tools needed to work more effectively with our partners in state, tribal, and local governments. Federal food safety agencies already have many of the tools identified by the NAS and have used them to establish extensive partnerships with state, tribal, and local governments. However, some tools are missing and much more needs to be done to better coordinate the federal government's interactions with other levels of government. The Council agrees that the roles of state, tribal, and local governments in the food safety system are critical and that their efforts deserve the formal recognition that partnership in a national food safety system conveys.



Serfilco, Ltd.

Serfilco Introduces Ready-to-Use Disc Filtration Systems

These new ready-to-use disc filtration systems have been specially configured for the filtering needs of platers. They offer high flow rates (up to 19,000 GPH) and high solids loading areas (60 to 105 square feet), with a choice of pumps for solution compatibility and disc filter media density to better achieve the requirements of the plating application.

Each model comes complete with a motor starter with overload protection, pump protector to shut the pump in case of flow interruption, davit cover lift to facilitate maintenance, slurry tank for pump priming and for precoating the filter discs with filter aid and/or carbon, pressure gauge and all the valving necessary to make the plater's job easier. For those applications which require it, an optional carbon purification chamber is available for organic removal.

Serfilco, Ltd., Northbrook, IL

Reader Service No. 263

Introducing a Next-Day *Salmonella* Test by BioControl Systems

BioControl Systems Inc., developer and manufacturer of rapid food safety diagnostic tests, recently launched an innovative new *Salmonella* test – Assurance Gold *Salmonella* EIA.

Assurance Gold *Salmonella* EIA gives highly accurate next day results, a significant improvement over the minimum three to seven days required by standard cultural methods. It is also faster than other rapid tests on the market. The streamlined enrichment protocol provides next day results for processed foods, considerably less than the two days required by almost all other rapid methods.

Assurance Gold *Salmonella* EIA also allows for visual or instrumental read-out of test results. Visual results can be obtained by simply comparing the presence of a blue color in samples to the Color Standard card provided. If a numerical result is preferred, the test results can be read with a standard microplate reader to obtain the exact optical density (OD).

Testing for *Salmonella* has become faster and more convenient with the Assurance Gold EIA while maintaining specificity and sensitivity. Assurance Gold EIA uses a proprietary antibody system, which detects both motile and non-motile *Salmonella* while minimizing cross-reactivity. The unique enrichment protocol utilized by Assurance Gold *Salmonella* EIA allows for greater sensitivity without sacrificing speed.

In its fourteenth year of operations BioControl Systems Inc. is a market leader in rapid diagnostic test kits for the detection of foodborne pathogens including *Listeria monocytogenes* and *E. coli* O157:H7. Assurance Gold *Salmonella* EIA enhances BioControl's current line of *Salmonella* tests which include the 1-2 test, the VIP for *Salmonella,* and Assurance *Salmonella* EIA.

BioControl, Bellevue, WA

Reader Service No. 264

Non-Metallic Magnetic Drive Pumps from Pacer Pumps

Series X non-metallic seal-less centrifugal pumps providing corrosion resistance, total solution and vapor containment. They can handle strong acids, bases, plating, photographic chemicals and pure water solutions. Materials of construction include Polypropylene, PVDF, and ETFE thermoplas-

tics. Compact pump and motor design with powerful magnets and low friction for energy efficiency. The Series X offers a product range from 1 to 29 GPM, max TDH to 62 ft and handling high specific gravity liquids. Pumps come with hose barb or NPT connections.

Pacer Pumps, Lancaster, PA

Reader Service No. 265

Listeria Testing: Rapid Results with Culture Confirmation from Dynal

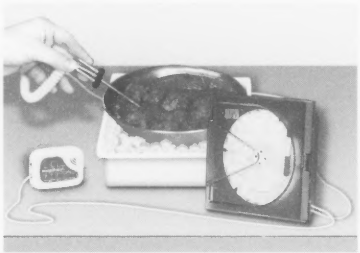
Dynabeads® anti-Listeria is designed for rapid, immunomagnetic selective enrichment (IMS) of *Listeria* directly from pre-enrichment broths. The rapid and simple protocol (less than 30 minutes) saves 24 hours of valuable testing time compared to standard culture methods because Dynabeads® anti-Listeria simply replaces the use of Fraser selective enrichment broths. Isolated *Listeria* colonies (or negative results) are achieved in 48 hours from receipt of sample.

Dynabeads® anti-Listeria are uniform, superparamagnetic microspheres (2.8 microns in diameter) with affinity purified antibodies on their surface. When incubated with a sample, Dynabeads® will bind their target bacterium forming a bacterium: magnetic bead complex. This complex is separated from the heterogeneous sample by performing the test in a magnetic test tube rack (Dynal MPC®-M). The isolated and concentrated bacterium:bead complex can then be cultured on any selective culture medium (e.g., Oxford, Palcam).

Dynabeads® IMS method is a rapid culture technique. Colony acquisition means rapid results with culture confirmation. This highly sensitive system will detect as few as 100 organisms/ml of pre-enriched sample. Complete detection is achieved for the genus *Listeria*. The concentration and purification of the sample by immunomagnetic separation (IMS) improves bacterial isolation and thus is useful for cultural confirmation of other presumptive methods. The protocol is simple and reagents are shelf stable. The versatility provided by this methodology will allow testing of many different sample types while enhancing the efficiency of existing manual and automated detection methods.

Dynal, Inc., Lake Success, NY

Reader Service No. 266



All QA Products, Inc.

Time-Temperature Food "Cool-Down" Recorder for HACCP in Food Safety

Just-cooked foods cooling in refrigerators can take days to cool. Thus, hot food must not be placed in refrigerators without pre-cooling. Temperatures between 140°F and 40°F cause any re-introduced bacteria to grow quickly This bacteria often causes sickness. Cool-down time and temperature is important to know to ensure food safety

It is essential to know each HACCP recipe's expected cool-down time. For food to be refrigerated, test measurements should be made and records kept. Chefs and inspectors need to be aware of this data. An example of temperature cool-down measurement is placing hot cooked food in a 4" deep pan that is placed on a bed of crushed ice and then covered for a certain amount of time. At that time, a temperature measurement should be taken and a recording is preferred to document the cool-down performance.

Two easy temperature recording methods are shown in the illustration. The model on the right is a round-chart recording thermometer, with a remote thermocouple probe's sensing tip located at the last location to be coded, the center of the food. The recorded trace provides documentation of the time and temperature data of the cool-down period. This economical round-chart model #AQA1367-01 is usable with any Type K thermocouple probe.

In addition to the food cool-down temperature recording, the same equipment can also be used to test and record the operation of other food heating and cooling equipment to find refrigeration short-cycling and other equipment malfunctions.

All QA Products, Inc., Gainesville, FL

Reader Service No. 267

QA Life Sciences Introduces 24-Hour *Listeria* Enumeration Method

QA Life Sciences is pleased to announce that it has completed an AOAC pre-collaborative study of its newest ISO-GRID method, a 24-hour *Listeria* enumeration method. This procedure produces in 24 hours a presumptive count for *Listeria* with a confirmation for either total *Listeria* or *L. monocytogenes* in a further 24 hours. This test is the fastest known commercial procedure for the detection, enumeration and confirmation of this organism.

This *Listeria* method has taken four years to develop, culminating in the creation of LM-137, a new selective culture medium for

Listeria. At a cost per test of just $1.95 (disposables), this affordable method is ideal for (a) quick and reliable measuring of improvements in plant sanitation procedures and (b) shelf-life challenge studies to establish product safety.

QA Life Sciences' new *Listeria* protocol is highly versatile, capable of detecting and enumerating either *Listeria* spp. or *L. monocytogenes*. In addition, the method has demonstrated its superior performance over a wide range of food products and environmental samples.

This *Listeria* method has now been proposed for a formal AOAC sponsored collaborative study, which is expected to take place during 1999.

QA Life Sciences, Inc., San Diego, CA

Reader Service No. 268

Gene-Trak® *Listeria* Assay, Gene-Trak® *Listeria* DLP Assay, and Gene-Trak® *Listeria monocytogenes* Assay

Gene-Trak Systems offers three highly specific and sensitive assays for the detection of *Listeria* in dairy, meat, seafood, and environmental samples. The Gene-Trak® *Listeria* Assay, Gene-Trak® *Listeria* DLP Assay, and Gene-Trak *Listeria monocytogenes* Assay use DNA probe-based technology to minimize false results and save time involved in laborious confirmation work.

The Gene-Trak® *Listeria* Assay has AOAC Official First Action Status and is designed to detect *Listeria* spp. in 2.5 hours after a standard enrichment protocol. The Gene-Trak® *Listeria* DLP Assay uses direct labeled probes for detection, and uses a shortened assay protocol. The Gene-Trak® *Listeria monocytogenes* Assay specifically detects *Listeria monocytogenes* and eliminates subjectivity that is often found with traditional methods. Gene-Trak® Assays offer rapid results for faster release of raw materials and finished goods into distribution channels than possible with con-ventional methods.

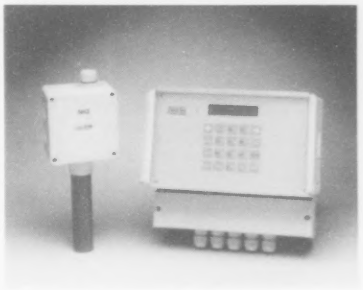
Gene-Trak Systems manufactures and distributes rapid diagnostic tests for the detection of pathogens, toxins and chemical analyses in food. Five additional DNA hybridization assays for *Salmonella* spp., *E. coli*, *Staphylococcus aureus* and *Campylobacter* spp. are also available. Gene-Trak Systems product offerings include a line of immunoassays for pathogen detection, microbiological culture media, and food chemical analysis test kits.

Gene-Trak Systems, Hopkinton, MA

Reader Service No. 269

New Hazardous Gas Monitor from Capital Controls

Capital Controls Company, Inc. is pleased to add the Chloralert® Plus Hazardous Gas Monitor to the Chlortrol product line. Chloralert® Plus is a state-of- the- art device designed to rapidly measure and alarm in the presence of low concentrations of toxic gases.



Copitol Controls Co., Inc.

The microprocessor-based receiver can accept input from up to four independent sensors each designed to accurately determine part per million levels of chlorine, ammonia, sulfur dioxide or ozone.

Design features include:

Long Life Sensor, 2-year life under normal conditions; flexible configuration, up to four combinations of gas sensors with multiple assignable alarm relays; convenient installation-NEMA 4X receiver allows indoor or outdoor installation; simple calibration, menu-driven procedures allow one person to easily calibrate sensors and receiver; comprehensive display, 2-line by 20-character backlit LCD displays short term exposure limits, time weighted averages, calibration data, alarm settings and conditions, and alarm history for each sensor; minimal maintenance, self-diagnostics and sensor failure detection; uninterrupted operation, optional battery backup; and communications, optional 4-20 mAdc, RS232 or RS485

Capital Controls Company, Inc., Colmar, PA

Reader Service No. 270

BusinessExchange

Services/Products

ADVERTISING INDEX

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

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:

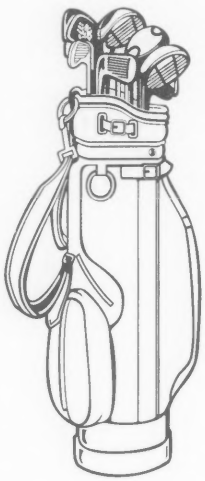
_____

_____

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 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.



IAMFES ANNUAL MEETING GOLF TOURNAMENT AT INKSTER VALLEY GOLF CLUB

Sunday, August 1, 1999

6:00 a.m. – 2:00 p.m.

Bus leaves the hotel at 6:00 a.m.

Come early and enjoy 18 holes of golf!

FORE! Best-Ball Golf Tournament

A swinging good time at the newest golf course in the area — the Inkster Valley Golf Club. 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.

Join your friends and colleagues in a round of golf; call the IAMFES office at 800.369.6337; 515.276.3344; Fax us at 515.276.8655 to request a registration form or see page 371 of this issue of *DFES*.

Companies:

Are you looking for a way to promote your company at the IAMFES Annual Meeting? IAMFES is looking for sponsorship support of this event. If you will consider providing quality prizes (or cash prizes) for the IAMFES Golf Tournament, we would like to hear from you. Call David Tharp at the phone numbers listed above for more details.

FIGHT BAC!™

Now available is a new visual tool that brings the four food safety principles to life by presenting them in a simple, graphically interesting manner. IAMFES encourages its members to become involved. Join this effort and you can help close the gap!

For information on joining the FIGHT BAC!™ campaign, contact: The Partnership for Food Safety Education, Phone: 202.429.8273; Fax: 202.429.4550; Web site: www.fightbac.org.

3-A Sanitary Standards Annual Meeting

May 17-21, 1999

Grand Milwaukee Hotel
Milwaukee, Wisconsin

For further information, contact Philomena Short at 703.761.2600

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
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E-mail: leeann_jaykus@ncsu.edu

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

Lawrence A. Roth
Phone: 780.427.4054 Fax: 780.436.9454
E-mail: lroth@gpu.srv.ualberta.ca

Constitution and Bylaws

Michael H. Brodsky
Phone: 905.889.8092 Fax: 905.889.2276
E-mail: brodskycon@aol.com

Developing Scientist Awards

Ann Marie McNamara
Phone: 202.501.6022 Fax: 202.501.6929
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Education Task Force

Dorothy M. Wrigley
Phone: 507.389.5738 Fax: 507.389.2788
E-mail: dorothy.wrigley@mankato.msus.edu

SUPPORT GROUPS

Affiliate Council

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

Foundation Fund

Harry Haverland
Phone: 513.851.1810

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 Globalization of Foodborne Disease

- Types of Foodborne Outbreaks in Developing Countries – EWEN TODD, Health Canada, Ottawa, Ontario, Canada
- The Prevention of Spread of Foodborne Disease from a WHO Perspective – YASMINE MOTARJEMI, WHO, Geneva, Switzerland
- The Americas – ELLEN MORRISON, FDA, Washington, D.C., USA
- Trade with and within Europe – MICHIEL VAN SCHOTHORST, Nestec Ltd., Vevey, Switzerland
- Japan – HIROSHI TAKAHASHI, National Institute of Infectious Diseases, Tokyo, Japan
- Australia and New Zealand – TRISH DESMARCHELIER, CSIRO, Tingalpa, Queensland, Australia

S2 Fruits and Vegetables: Are They Safe Enough?

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

S3 Mini Workshop for Dairy Plant Employees and Regulators

- Plant Regulatory Inspection – CHARLES PRICE, SR., FDA, Chicago, IL, USA
- Employee G.M.P.'s – GAYLORD SMITH, Mohawk Assoc., Inc., Schenectady, NY, USA
- Standards Pertaining to Product Quality – RUTH FUQUA, Quality Creek Dairies, Inc., Mt. Juliet, TN, USA
- Sanitary Design & Installation of Equipment – DON GRAHAM, Graham Sanitary Design Consulting, Chesterfield, MO, USA

Microbiology of Meat and Poultry — Technical Session

T1 Reduction of *E. coli* O157:H7 Concentrations in Ruminal Contents In Vitro; Bacteriocidal Effect of Sodium Chlorate – ROBIN C. ANDERSON, David J. Nisbet, Sandra A. Buckely, Roger B. Harvey, and Larry H. Stanker, USDA, ARS, College Station, TX, USA

T2 Incidence of *E. coli* O157:H7 in Frozen Beef Patties Produced Over an Eight Hour Shift – W. PAYTON PRUETT, JR., Timothy Biela, Russell S. Flowers, Peter Mrozinski, Charles Lattauada, Bonnie Rose, Ann Marie McNamara, James O. Reagan, David Theno, and William Osborne, Silliker Laboratories Group, Inc., Homewood, IL, USA

T3 Commercial Evaluation of Multiple-Sequential 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

T4 Verification of the Effectiveness of a Second 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

T5 Effectiveness of Potassium Lactate and Lactic 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

T6 Chlorination of Chill Tanks Reduces Salmonellae on Processed Broiler Carcasses – J. STAN BAILEY, N. A. Cox, and N. J. Stern, USDA, Athens, GA, USA

T7 Cross-contamination Model for *Salmonella* in Poultry Chilling Process – HONG YANG, Yanbin Li, and Michael G. Johnson, University of Arkansas, Fayetteville, AR, USA

T8 A Computer Software Application of Assessing the Risk and Severity of *Salmonella* and *Campylobacter* Infections from Poultry Products – THOMAS P. OSCAR, USDA, ARS, Princess Anne, MD, USA

T9 Changes in the Native Microflora, Weight, and pH of the Ceca of Turkeys Subjected to Feed Withdrawal – ARTHUR HINTON, JR., R. Jeff Buhr, and Kimberly D. Ingram, PPMQ, ARS, USDA, Athens, GA, USA

T10 Use of Whey-based Film Containing Antimicrobial 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

T11 Levels of Microbiological Contamination of 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

T12 Extent of Microbiological Contamination 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

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. monocytogenes* – 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, Kara B. Mikkelson-Baldus, Adam C. Borger, W. Mark Barbour, and Paul A. Hall, Kraft Foods, Oscar Mayer Division, Madison, WI, USA

P4 Immunoassay-based Test for Detection of Peanuts in Food Products – MOHAMED M. ABOUZIED, Scott A. Askegard, Paul S. Satoh, Susan L. Hefle, Julie A. Nordlee, and Steve L. Taylor, Neogen Corporation, Lansing, MI, USA

P5 Detection of Egg Contamination in Food Products by Immunoassay-based Test – MOHAMED M. ABOUZIED, Carrie J. Fetzner, Paul S. Satoh, Susan L. Hefle, Elizabeth Jeanniton, and Steve 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, Joshua Deabel, Vidhya Gangar, and Mishael 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 Gregory 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, San 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, Michiko Matsuura, Lisa A. Yagi, and Paul 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, Hugh Trenk, and Paul A. Hall, Kraft Foods, Tarrytown, NY, USA

P20 Isolation of Foodborne *Salmonella* Using Dynabeads® Anti-*Salmonella* and Oxiod 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. Poumerol, Diffchamb S.A., Lyon, France

P26 Cleaning Validation in Food Retail Environments by a New Protein Assay – BRIAN ECKENROTH and Elizabeth 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. Schlesser, and Ali 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, Elisabeth Marquis-Boistier, and Jean-Paul 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, Dianne L. Peters, and Susan S. Sumner, University of Nebraska, Lincoln, NE, USA

MONDAY AFTERNOON — AUGUST 2, 1999

S4 Science-based Criteria for Harmonizing Food Safety Regulations

- Scientific Basis for Setting Performance Standards – JEAN-LOUIS JOURE, European Commission, Brussels, Belgium
- Harmonization of *Listeria* Tolerance Limits – European Experience – PAUL TEUFEL, Federal Research Center for Milk, Kiel, Germany
- Harmonization of Acceptance Criteria for Microbiological Methods – RUSSELL FLOWERS, Silliker Laboratories Group, Chicago, IL, USA
- Equivalence of Inspection Systems for International Trade – CATHERINE CARNEVALE, CFSAN-FDA, Washington, D.C., USA
- Why Microbiological Criteria for Enterohemorrhagic *Escherichia coli* and Not Shiga Toxin-producing *E. coli* in Foods? – MICHAEL DOYLE, University of Georgia, Griffin, GA, USA
- Panel Discussion

S5 Manure and Water: Produce Safety Implications

- Water and Manure Safety Issues for the Next Millennium – DEAN O. CLIVER, University of California-Davis, Davis, CA, USA
- Water Quality and Safety – JOAN ROSE, University of South Florida, St. Petersburg, FL, USA
- Developing Manure Management Controls for Conventional and Organic Farming – TREVOR SUSLOW, University of California-Davis, Davis, CA, USA
- Manure Quality and Safety – GARRY FORNEY, Bull Enterprises, El Centro, CA, USA
- Field Sanitation/Worker Hygiene Issues – FRANCES PABRUA, California Strawberry Commission, Watsonville, CA, USA
- Panel Discussion

S6 Dairy Plant Quality and Safety Programs

- Preventive Maintenance in Dairy Plants – CHRIS NEWCOMER, New-Tech Consulting, Inc., Cincinnati, OH, USA
- Dairy Plant Quality Control – DEAN SUMMERS, Alto Cheese, Wampun, WI, USA
- Implementing a HACCP Program – JEFF MAIATICO, DFA, New Wilmington, PA, USA
- Designing a HACCP Plan – RANDY DOUGHERTY, National Sanitation Foundation, Ann Arbor, MI, USA
- Report from the NCIMS HACCP Committee – CLANDIA COLES, Washington State DPA, Olympia, WA, USA
- Dairy Plant Prerequisites – STEVE SIMS, M.S.B., Washington, D.C., USA

General Food Microbiology — Technical Session

T13 Modeling the Growth Boundary of *Staphylococcus aureus* for Risk Assessment Purposes — CYNTHIA M. STEWART, Martin B. Cole, J. David Legan, Donald Schaffner, Louise Slade, and Mark Vandeven, Nabisco Inc., E. Hanover, NJ, USA

T14 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

T15 Bacteriophage Activity against *E. coli* O157:H7 and *Salmonella* spp. — ANANTA P. DESSAI, L. R. Chery, and S. L. Archie, Tuskegee University, Tuskegee, AL, USA

T16 Effect of Chlorine Treatment on Heat Inactivation of *E. coli* O157:H7 — JAMES P. FOLSOM and Joseph F. Frank, University of Georgia, Athens, GA, USA

T17 Application of Treatments to Reduce Contamination of Pork Variety Meats — HENRY N. ZERBY, K. E. Belk, M. Hardin, W. Lloyd, J. N. Sofos, and G. C. Smith, Colorada State University, Fort Collins, CO, USA

T18 Inactivation of *E. coli* O157:H7 and *L. monocytogenes* on Apples Using Ozone, Chlorine Dioxide, Sodium Hypochlorite and Peracetic Acid — STEPHANIE L. RODGERS, Jerry N. Cash, and Elliot T. Ryser, Michigan State University, East Lansing, MI, USA

T19 Microbial Reduction of Laboratory Inoculated Produce Surfaces by Rinsing and Wiping with Paper Towels and Comparison to 200 PPM Chlorine Dip — BARRY MICHAELS, Vidhya Gangar, Eric Meyers, Heidi Johnson, and Michael S. Curiale, Georgia Pacific Corporation, Palatka, FL, USA

T20 Efficacy of Ultraviolet Light to Eliminate *E. coli* 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

T21 Inhibition of Growth and Aflatoxin Production of *Aspergillus parasiticus* by Korean Soybean Paste (Doen-jang) and Identification of the Active Component — JONG-GYU KIM, Yong-Wook Lee, Pan-Gyi Kim, Woo-Sup Roh, and Hideharu Shintani, Keimyung University, Taegu, Korea

T22 Critical Role of *Pediococcus* sp. Cytoplasmic Membrane in Thermal Resistance — BASSAM A. ANNOUS, USDA, Wyndmoor, PA, USA

T23 Antibiotic Resistance of Gram-negative Enteric 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

T24 Distribution and Role of Integrons in Multi-resistant *Salmonella* — LANCE F. BOLTON, Lynda C. Kelley, and Paula J. Fedorka-Cray, USDA-ARS-PMSRU, Athens, GA, USA

Microbiology of Meat, Poultry, and Produce — Poster Session

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, San Paulo, SP, Brazil

P36 Production of Mortadella: Behavior of *L. monocytogenes* under Commercial Manufacturing and Storage Conditions — MARIA T. DESTRO and L. S. Bersot, FCF/USP, San 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, Mark A. Harrison, Ruth Ann Rose-Morrow, and Robert 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 Glenn 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 Ronald 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, Shanna Lively, and Romeo Toledo, The University of Georgia, Athens, GA, USA

P48 The Occurrence of *Campylobacter* spp. in Swine Carcass Dressing Operations – SAMUEL A. PALUMBO, Jeffrey E. Call, Benne S. Marmer, and Linda 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. Schlesser, 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 – D.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 Donald 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 Joseph F. Frank, University of Georgia, Athens, GA, USA

P54 Sodium Chloride and Sodium Bicarbonate Washing Solution for Removal of Entero-hemorragic *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 – L. 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 Linda J. Harris, University of California, Davis, CA, USA

P57 Recovery of Generic *E. coli* from Juice – DAVID E. TOWNSEND and Shawn 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

T25 Development, Implementation and Analysis 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

T26 Microbial Colonization with Biofilm Formation on Packaging Film and Vegetable Tissue of Ready-to-Use Packaged Spinach – SUSAN ABRAHAM, Heidi Schraft, and Marvin A. Tung, University of Guelph, Guelph, Ontario, Canada

T27 Effect of Microwave Cooking on the Recovery 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

T28 Survey of Production Practices Used by Virginia Apple Cider Processors – JIM R. WRIGHT, S. S. Sumner, C. R. Hackney, and M. D. Pierson, Virginia Tech, Blacksburg, VA, USA

T29 Science, Society, and Cider: A Comparative 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

T30 A Quantitative Risk Assessment for Determining the Efficacy of Various Hand Washing Practices – REBECCA MONTVILLE and Donald Schaffner, Cook College, New Brunswick, NJ, USA

T31 The Dynamics of Surface Cleaning and Sanitization – BARRY MICHAELS, Vidhya Gangar, Ann Roering, and Michael S. Curiale, Georgia Pacific Corporation, Palatka, FL, USA

T32 Occurrence of *L. monocytogenes*, *Salmonella*, *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

T33 Behavior of *E. coli* O157:H7 on Alfalfa Sprouts during the Sprouting Process as Influenced by Treatments with Various Chemicals – PETER J. TAORMINA and L. R. Beuchat, University of Georgia, Griffin, GA, USA

T34 Outbreaks of Viral Gastroenteritis Associated with Imported Raspberries – COLETTE GAULIN, Danielle Ramsay, Pierrette Cardinal, and Marie-Alix D'Halevyn, Public Health Center of Quebec City, Beauport, Canada

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

- Critical Role of Membranes in Bacteriocin, Antibiotic, and Preservative Resistance – THOMAS J. MONTVILLE, Rutgers, The State University of New Jersey, New Brunswick, NJ, USA
- Potential for Emergence of Resistance to Antimicrobials Used in the Food Industry – P. MICHAEL DAVIDSON, University of Tennessee, Knoxville, TN, USA
- Problems and Solutions to Development of Pathogen Resistance to Thermal Processing – ALEJANDRO S. MAZZOTTA, National Food Processors Assn., Washington, D.C., USA
- F-ATPases, Adaptive Acid Tolerance, and Coupled Oxidative Stress Resistance in Lactic-acid Bacteria – ROBERT E. MARQUIS, University of Rochester, Rochester, NY, USA
- Sanitizers/Disinfectants – LYNNE M. SEHULSTER, CDC, Atlanta, GA, USA
- Microbial Resistance and Food Irradiation – ELSA MURANO, Texas A&M University, College Station, TX, USA

S8 Overview of Dairy Plant Regulations

- Overview of Agencies and Jurisdictions – CARY FRYE, IDFA, Washington, D.C., USA
- USDA Responsibilities as It Pertains to Plant Regulations – PHILIP WOLFF, USDA, Washington, D.C., USA
- OSHA and EPA's Role in Plant Regulations – JOHN WOLGEMUTH, J. W. Safety Management and Training, Hummelstown, PA, USA
- 1999 IMS Conference: From a State Perspective – PAUL HOGE, PDA, Harrisburg, PA, USA
- Bureau of Weights and Measures: Role in Plant Regulation – MICHAEL PINAGEL, Michigan Department of Agriculture, Williamston, MI, USA
- Viewpoint: Codex/Inter. Standards – ROB BYRNE, NMPF, Arlington, VA, USA

Microbiological Methods and Miscellaneous – Technical Session

T35 An Epidemiological Study of *Pseudomonas aeruginosa* Strains Associated with Mastitis among Dairy Animals and Human Infections Based on Automated Ribotyping with the Restriction Enzyme *Pvu*II – JAMES L. BRUCE, Ariel L. Rivas, Mary Bodis, Renate Klein, and Kevin Anderson, Qualicon, Inc., Wilmington, DE, USA

T36 Fate of *L. monocytogenes* and *E. coli* O157:H7 in Dairy Foods – FATHY E. EL-GAZZAR and Seham Farrag, University of Assiut, Egypt

T37 Biochemical Comparison of *L. lactis* spp. *Lactis biovar*. diacetylactis WRP297 and WRP298, Phage Resistant Variants, with Original Sensitive Culture Used for Cheese Manufacture – R. PIRABHAKARAN and Rattan Chand, National Dairy Research Institute, Karnal, India

T38 A Comparative Study of a Colorimetric ATP Measurement Test, ATP Bioluminescence and Protein Detection for Hygiene Monitoring – MARK CARTER, Ramin Pirzad, James Baker, Drew Ferguson, Paul Meighan, and Peter Grant, Celsis, Inc., Evanston, IL, USA

T39 An Isolation and Detection System for *L. monocytogenes* Using Fluorogenic and Chromogenic Substrates for Phosphatidylinositol-specific Phospholipase C – LAWRENCE RESTAINO, Elon W. Frampton, Robert M. Irbe, Gunter Schabert, and Hans Spitz, R & F Laboratories, West Chicago, IL, USA

T40 Detection and Tracking of *L. monocytogenes* in Smoked Fish Plants – MARTIN WIEDMANN, Dawn Norton, Meghan McCamey, Ken Gall, and Kathryn J. Boor, Cornell University, Ithaca, NY, USA

T41 Effects of Cryogenic Cooling and Traditional Cooling on *Salmonella* Enteritidis Population in Table Eggs – LAVONDA A. HUGHES, D. E. Conner, P. A. Curtis, and K. M. Keener, Auburn University, Auburn, AL, USA

T42 The Impact of Training on Grocery Store Seafood Employees' Food Safety and Sanitation Knowledge, Practices, and Department Profitability – TORI L. STIVERS and Keith W. Gates, University of Georgia Marine Extension Service, Peachtree City, GA, USA

T43 Microbiological Monitoring of "Bobby" Calf Slaughter and Dressing: The Need for a Stand-alone Program Design – ROGER COOK, Christine Esquerra, Monique Biss, and Steve Hathaway, Ministry of Agriculture & Forestry Regulatory Auth., Wellington, New Zealand

T44 Species and Strain Differentiation of *Pseudomonas* spp. by Ribotyping – KATHRYN J. BOOR, Martin Weidmann, John W. Czakja, Denise Weilmeier, Sean Dineen, and Robert Ralyea, Cornell University, Ithaca, NY, USA

T45 A Single-step Polymerase Chain Reaction for Combined Gene Detection and Epidemiological Typing (COGEDET) of *L. monocytogenes* Strains – JEFFREY M. FARBER, Elaine Daley, and Diane Medeiros, Health Canada, Ottawa, Ontario, Canada

T46 Development of Hybridoma Cell Line for the Production of a Monoclonal Antibody to Pesticide Bromacil – SUNG J. KANG, Jin S. Kang, and Duck H. Chung, Gyengsang National University, Chinju, Gyangnam, Korea

General Food Microbiology – Poster Session

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, Ceyla 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, Boonsong Saeng-On, David A. Golden, and James 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 Acic – ROBERT C. WILLIAMS and David A. Golden, The University of Tennessee, Knoxville, TN, USA

P70 Occurrence of *L. monocytogenes* in Mexican Cheeses – JORGE A. SALTIJERAL O., Claudia E. Solano L., Valente B. Alvarez, Beatriz Garcia F., and Humberto 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, Angelo DePaola, and Douglas 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 Leora 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. Ann Draughon, The University of Tennessee, Knoxville, TN, USA

P75 Inhibition of *E. coli* O157:H7 by Herbal and Spice Essential Oils – MONA ELGAYYAR, F. Ann Draughon, David A. Golden, and John 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 Donald 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. Welti-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 Eugene 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 Joseph 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, Peter G. Poulos, Martin B. Cole, Mark Vandeven, and J. David 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 Oxidantic Toxicity in Mice – JUNG HYEON PARK, Sung J. Kang, and Duck H. Chung, Gyengsand 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, Kathryn Lindberg, and Deborah 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, Dalia Alfi, and Linda Grimm, University of Washington, Seattle, WA, USA

P97 Model for the Implementation of HACCP in the Food Industry of Developing Countries, J. 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

- Molecular Typing of *Listeria monocytogenes* in US Outbreak, MARTIN WIEDMANN, Cornell University, Ithaca, NY, USA
- Epidemiology of *Listeria* Outbreak, PAUL MEAD, CDC, Atlanta, GA, USA
- Industry Perspective of *Listeria* Outbreak, DANE BERNARD, National Food Processors Association, Washington, D.C., USA
- Panel Discussion

IAMFES Business Meeting

WEDNESDAY MORNING — AUGUST 4, 1999

S10 USDA Risk Assessment of *E. coli* O157:H7 in Ground Beef

- 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
- Production Module – ERIC EBEL, USDA/FSIS, Ft. Collins, CO, USA
- Slaughter Concentration Variables – TANYA ROBERTS, USDA/ERS, Washington, D.C., USA
- Slaughter Product Fraction Variables – PETER COWEN, USDA/FSIS/OPHS/ERAD, Washington, D.C., USA
- Slaughter Simulation Model – CLARE NARROD, USDA/FSIS/OPHS/ERAD, Washington, D.C., USA
- Preparation Module – WAYNE SCHLOSSER, USDA/FSIS, Fort Collins, CO, USA
- Public Health Module – PEG COLEMAN, USDA/FSIS/OPHS/ERAD, Washington, D.C., USA
- Risk Communication – PETER COWEN, USDA/FSIS/OPHS/ERAD, Washington, D.C., USA
- Panel Discussion

S11 Animal Waste Management and Its Relationship to Food Safety

- Microbes and Manure: Animal and Human Health Concerns – ALICE N. PELL, Cornell University, Ithaca, NY, USA
- 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
- Persistence of Pathogenic Bacteria in Animal Waste – CAROLYN HOVDE BOHACH, University of Idaho, Moscow, ID, USA
- Persistence of Viruses in Animal Waste – DEAN O. CLIVER, University of California-Davis, Davis, CA, USA
- Presence of Microbial Pathogens in Processed Animal Waste Used as Animal Feed – JAMES S. CULLOR,Veterinary Medicine Teaching and Research Center, Tulare, CA, USA
- Animal and Waste Water Management: Who's Minding the Store? – EMILIO ESTEBAN, CDC, Atlanta, GA, USA

S12 New Emerging Pathogens — *Mycobacterium* spp.

- Overview of *Mycobacterium* spp. and Their Role as Foodborne Pathogens – LUCIC MUTHARIA, University of Guelph, Guelph, Ontario, Canada

- Survival of *M. paratuberculosis* in HTST Milk – MIKE COLLINS, University of Wisconsin, Madison, WI, USA
- *Mycobacterium* spp. as Environmental Pathogens – YVONNE TAYLOR, University of Ottawa, Ottawa, Ontario, Canada
- Crohn's Disease and the Link to Foodborne Pathogens: Fact or Fallacy – To be announced
- Methods to Detect and Identify *Mycobacterium* spp. in Environmental Samples – BOB ARBEIT, VA Hospital, Boston, MA, USA
- Panel Discussion

S13 – HACCP in Retail Operations

- The Maryland Voluntary Retail HACCP Program – LISL WILKINSON, Maryland Hospitality Education Foundation, Baltimore, MD, USA
- Retail HACCP in Florida – CLIFF WARWICK, REHS, Orlando, FL, USA
- HACCP in Hotel Food Service – DONALD B. GRIM, Marriott International, Inc., Washington, D.C., USA
- HACCP in Food Markets – FREDRICK REIMERS, H-E-B Grocery Company, San Antonio, TX, USA
- HACCP in Restaurants – DEE CLINGMAN, Darden Restaurants, Inc., Orlando, FL, USA
- 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?

- Overview and Reflections of HACCP for Meat and Poultry Plants – DANE T. BERNARD, National Food Processors Association, Washington, D.C., USA
- HACCP Implementation Experiences in a Large Plant – PETER BODNARUK, ConAgra Refrigerated Prepared Foods, Downers Grove, IL, USA
- HACCP Implementation Experiences in a Small Plant – HERB TETENS, Marathon Enterprises, Jersey City, NJ, USA
- USDA FSIS Overview of HACCP - Past, Present and Future Challenges – BARBARA MASTERS, USDA/FSIS Technical Service Center, Omaha, NE, USA
- HACCP Model Demonstration Project Experiences - The Future? – ALAN OSER, Hatfield Quality Meats, Inc., Hatfield, PA, USA
- 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

- Prevalence of *Campylobacter* in Human Disease – FRED ANGULO, CDC, Atlanta, GA, USA
- Guillain-Barre Syndrome and Other Chronic Sequellae of Campylobacteriosis – BAN MISHU, Vanderbilt University, Nashville, TN, USA
- Modern Cultural Methodology for the Isolation of *Campylobacter* spp. – J. ERIC LINE, USDA, ARS, Athens, GA, USA
- Subtyping of *Campylobacter* spp. – SCOTT FRITSCHEL, Qualicon®, Inc., Wilmington, DE, USA
- Risk Assessment and Regulatory Significance of *Campylobacter* spp. – ANNA LAMMERDING, Health Canada, Guelph, Ontario, Canada
- 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

- An Overview of Conventional Methods for Detecting Enteric Viruses in Foods – DEAN O. CLIVER, University of California-Davis, Davis, CA, USA
- Limitations in Cell Culture and Molecular Biological Methods for Detecting Infectious Viruses in Foods – GARY P. RICHARDS, USDA, ARS, Dover, DE, USA
- Integrated Cell Culture-PCR Techniques – CHARLES P. GERBA, University of Arizona, Tucson, AZ, USA
- Detection and Control of Viruses in Produce – MARK D. SOBSEY, University of North Carolina, Chapel Hill, NC, USA
- Role of Molecular Epidemiology in Virus Outbreak Investigations – LEE-ANN JAYKUS, North Carolina State University, Raleigh, NC, USA
- Panel Discussion

S17 The Seafood Safety Initiative

- Overview of Seafood Safety Initiative – ROBERT BUCHANAN, FDA, Washington, D.C., USA
- Considerations for Testing of *Listeria* in Seafood – CATHERINE DONNELLY, University of Vermont, Burlington, VT, USA
- Control of Viral and Bacterial Human Pathogens in Seafood – WILLIAM BURKHARDT, US FDA, Dauphin Island, AL, USA
- Food Service Chain Experience – KEITH JACKSON, Darden Restaurants, Orlando, FL, USA
- Levels of *V. vulnificus* and *V. parahaemolyticus* in Retail Seafood – ANGELO DEPAOLA, US FDA, Dauphin Island, AL, USA
- West Coast Working Group on *V. parahaemolyticus* Outbreaks – TIM SAMPLE, US FDA, Seattle, WA, USA

IAMFES ANNUAL MEETING

86th Dearborn • Michigan

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.

GENERAL INFORMATION

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 preceeding 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 *Journal of Food Protection* and *Dairy, Food and Environmental Sanitation* (Student Membership)*	**$140.00** ($70.00)	**165.00** ($95.00)	**$210.00** ($140.00)
Membership with *Dairy, Food and Environmental Sanitation* (Student Membership)*	**$85.00** ($42.50)	**$95.00** ($52.50)	**$110.00** ($67.50)
(Student Membership* with *Journal of Food Protection*)	($42.50)	($57.50)	($87.50)

**Full-time student verification required*

All prices include Shipping & Handling

Prices effective through August 31, 1999

FOR OFFICE USE
First initial Last name
Registration #
DFES

REGISTRATION FORM

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

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: ❒ Mon. ❒ Tues. ❒ 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:		# 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:

❒ VISA ❒ MasterCard ❒

Card # | | | | | | | | | | | | | | | | |

Exp. Date _____

Name on Card _____

Signature _____

EXHIBITORS DO NOT USE THIS FORM

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 ❑ VISA ❑ ❑ MasterCard

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)

Exhibitors
of the IAMFES 86th Annual Meeting

(Companies scheduled to exhibit as of March 31, 1999)

3-A Symbol Council
Phone: 803.783.9258 Fax: 803.783.9265

3M Microbiology Products
Phone: 651.733.0942 Fax: 651.737.7678

ABC Research Corp.
Phone: 352.372.0436 Fax: 352.378.6483

AOAC International
Phone: 301.924.7077 Fax: 301.924.7089

Advanced Analytical Technologies, Inc.
Phone: 515.296.6187 Fax: 515.296.9910

Advanced Instruments, Inc.
Phone: 781.320.9000 Fax: 781.320.8181

American Egg Board
Phone: 847.296.7043 Fax: 847.296.7007

American Proficiency Institute
Phone: 800.333.0958 Fax: 616.941.7287

Applied Research Institute
Phone: 203.270.7692 Fax: 203.426.3299

Aquionics Inc.
Phone: 606.341.0710 Fax: 606.341.0350

Atkins Technical
Phone: 352.378.5555 Fax: 352.335.6736

Audits International
Phone: 847.433.0900 Fax: 847.433.7873

Becton Dickinson Microbiology Systems
Phone: 410.316.4472 Fax: 410.316.4906

BioControl Systems, Inc.
Phone: 425.603.1123 x118 Fax: 425.603.0070

BioPath Inc.
Phone: 516.643.0388 Fax: 561.655.3361

Capitol Vial, Inc.
Phone: 800.772.8871 Fax: 518.853.3409

Celsis Inc.
Phone: 847.467.7870 Fax: 847.467.6602

Chemunex, Inc.
Phone: 732.329.1153 Fax: 732.329.1192

Cogent Technologies Ltd.
Phone: 513.469.6800 Fax: 513.469.6811

DQCI Services, Inc.
Phone: 612.785.0484 Fax: 612.785.0584

DYNAL, Inc.
Phone: 516.326.3270 Fax: 516.326.3298

Decagon Devices, Inc.
Phone: 800.755.2751 Fax: 509.332.5158

Diffchamb AB
Phone: 46.0.31.583270 Fax: 46.0.31.583370

E M Science
Phone: 800.222.0342 Fax: 609.423.6313

Elsevier Science
Phone: 212.633.3758 Fax: 212.633.3112

FDA Center for Food Safety and Applied Nutrition
Phone: 202.205.4220 Fax: 202.401.3532

FoodHandler
Phone: 800.338.4433 Fax: 516.338.5486

FoodLabs, Inc.
Phone: 785.537.1862 Fax: 785.537.0226

Food Quality Magazine
Phone: 215.860.7800 Fax: 215.860.7900

Food Testing & Analysis Magazine
Phone: 818.842.4777 Fax: 818.769.2939

Foss North America, Inc.
Phone: 612.974.9892 Fax: 612.974.9823

GENE-TRAK Systems
Phone: 508.435.7400 Fax: 508.435.0025

Gist-brocades
Phone: 414.255.7955 Fax: 414.255.7732

Glo Germ Company
Phone: 435.259.5931 Fax: 435.259.5930

Great Western Chemical Co.
Phone: 800.547.1400 x317 Fax: 503.227.7377

IDEXX Laboratories, Inc.
Phone: 207.856.0545 Fax: 207.856.0865

International BioProducts
Phone: 425.883.1349 Fax: 425.881.6880

Labplas Inc.
Phone: 450.649.7343 Fax: 450.649.3113

Malthus Diagnostics
Phone: 440.327.2585 Fax: 440.327.7286

Mega-International
Phone: 612.924.0863 Fax: 612.924.0701

Michelson Laboratories
Phone: 562.928.0553 Fax: 562.927.6625

MicroBioLogics, Inc.
Phone: 320.253.1640 Fax: 320.253.6250

Microsys Inc.
Phone: 800.818.8335 Fax: 613.271.1148

NASCO
Phone: 920.563.2446 Fax: 920.563.8296

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

Neogen Corporation
Phone: 517.372.9200 Fax: 517.372.0108

Norback, Ley & Associates LLC
Phone: 608.233.3814 Fax: 608.233.3895

Norton Performance Plastics
Phone: 330.798.6997 Fax: 330.798.6968

Organon Teknika
Phone: 919.620.2377 Fax: 919.620.2615

Oxoid Inc.
Phone: 613.226.1318 Fax: 613.226.3728

Pest West Electronics Limited
Phone: 4419.24.27.7631 Fax: 4419.24.27.4385

Q Laboratories
Phone: 513.471.1300 Fax: 513.471.5600

Qualicon
Phone: 302.695.2356 Fax: 302.695.4106

R-TECH® Laboratories
Phone: 651.481.2668 Fax: 651.481.2002

Raven Biological Laboratories, Inc.
Phone: 402.593.0781 Fax: 402.593.0995

Remel Inc.
Phone: 800.255.6730 Fax: 800.447.5750

Silliker Laboratories
Phone: 708.957.7878 Fax: 708.957.8449

VWR Scientific Products
Phone: 800.932.5000

Warren Analytical Laboratory
Phone: 800.945.6669 Fax: 970.351.6648

Weber Scientific
Phone: 609.584.7677 Fax: 609.584.8388

ZEP Manufacturing Company
Phone: 404.352.1680 Fax: 404.350.2742

The Editors are seeking articles of general interest and applied research with an emphasis on food safety for publication in *Dairy, Food and Environmental Sanitation.*

Submit your articles to:

Donna Bahun
Dairy, Food and Environmental Sanitation
c/o IAMFES, Inc.
6200 Aurora Ave., Suite 200W
Des Moines, Iowa 50322-2863

Please submit three copies of manuscripts along with a fourth copy on 3 1/2" computer disk.

ComingEvents

JUNE

·**3-4, International Prospects for Dairying in the Next WTO Negotiating Round,** Hotel Claridge, Buenos Aires, Argentina. Sponsored jointly by Food & Agriculture Organization of the UN, Pan American Dairy Federation, and International Dairy Federation. For additional information, contact Mr. Ricardo A. James, President Comité Nacional Argentino de la FIL, Medrano 281, 1178 Buenos Aires, Argentine; Phone: 54 1 983 6149; 54 1 983 0587, 54 1 983 1865; Fax: 54 1 958 4056; E-mail: cil@cil.org.ar.

·**7-9, Texas Association of Milk, Food and Environmental Sanitarians,** Austin, TX. For further details, contact Ron Richter at Texas A & M, Phone: 409.845.4409; E-mail: rlr8942@acs.tamu.edu.

·**7-10, New Applications of Membrane Technology in the Dairy Industry,** Palais du Grand Large, Saint-Malo, France. The seminar will attempt to assemble the most recent information on new applications of the membrane processes that would benefit the dairy processing industry worldwide. For further information, contact Prof. J. L. Maubois, Dairy Research Laboratory INRA, 65 Rue de Saint Brieuc, FR-35042 Rennes Cedex, France.

·**14-16, A Basic Concept for Food Protection,** Chapman University, Orange, CA. Managers and supervisors of food processing companies should attend this conference who are responsible for microbiology, quality assurance, quality control, sanitation, and for establishing HACCP programs. For further information, contact The Food Processors Institute, 1350 I St., N.W., Suite 300, Washington, D.C. 20005-3305; Phone: 202.393.0890; Fax: 202.639.5941.

·**14-16, The Food Safety Summit and Expo,** Washington, D.C. The conference serves food processors and manufacturers, as well as the food service and grocery fields, and others who produce, sell, or serve food. For more information, Phone: 800.746.9646.

·**14-16, Food Engineering,** Rutgers University, New Brunswick, NJ. For additional information, contact Keith Wilson, Phone: 732.932.9271; Fax: 732.932.1187; E-mail: ocpe@aesop.rutgers.edu; Web site: www.cook.rutgers.edu/ocpe.

·**21-23, FDA Regulation of New Food Ingredients and Dietary Supplements,** Chicago, IL. This course will enable participants to become familiar with all current FDA laws, regulations, practices and procedures governing the marking of new food ingredients and dietary supplements. For further information, contact Registrar, The Center for Professional Advancement, P.O. Box 1052, East Brunswick, NJ 08816; Phone: 732.613.4500; Fax: 732.238.9113.

·**23-24, Introduction to Microbiological Criteria and Sampling Plans,** Disneyland Pacific Hotel, Anaheim, CA. For additonal information, contact Silliker Laboratories, Education Services Dept., 900 Maple Road, Homewood, IL 60430; Phone: 800.829.7879; 708.957.7878; Fax: 708.957.8405.

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.

·**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 372 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 371 or contact Julie Cattanach 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 additonal information, contact Silliker Laboratories, Education Services Dept., 900 Maple Road, Homewood, IL 60430; Phone: 800.829.7879; 708.957.7878; Fax: 708.957.8405.

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.

· **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 production 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.

· **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.

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

OCTOBER

· **5-7, Principles of Food Microbiology,** Hyatt Regency Oak Brook, Oakbrook, IL. For additonal information, contact Silliker Laboratories, Education Services Dept., 900 Maple Road, Homewood, IL 60430; Phone: 800.829.7879; 708.957.7878; Fax: 708.957.8405.

· **6-7, Associated Illinois Milk, Food & Environmental Sanitarians Annual Meeting** at Pere Marquette Hotel in Peoria, IL. For additional information, contact Lee Dressel at 618.656.6680.

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

· **13-14, Foodtech 99,** National Exhibition Centre, Birmingham. This event will focus on food hygiene, safety and quality. For further information, Phone: 01275 464422; Fax: 01275 46410.

· **25-27, New Mexico Environmental Health Conference,** Albuquerque Convention Center, Albuquerque, NM. For questions contact, Tom Duker, Conference Chairman, NMEHC-99, P.O. Box 27176, Albuquerque, NM 87125-7176; Phone: 505.924.3667; Fax: 505.924.3684; E-mail: tduker@mercury.bernco.gov.

· **28-30, National Food Processors Assn's. 92nd Annual Convention,** Chicago Hilton and Towers in conjunction with the Worldwide Food Expo '99 at Chicago's McCormick Place, Chicago, IL. For further information, contact Al Rickard at 202.639.5995.

· **28-31, Worldwide Food Expo '99,** McCormick Place, Chicago, IL. For more information, please visit www.worldwidefood.com or call the fax-on-demand service at 703.645.9302.

NOVEMBER

· **1-5, Laboratory Methods in Food Microbiology,** Silliker Laboratories' Corporate Research Center, South Holland, IL. For additonal information, contact Silliker Laboratories, Education Services Dept., 900 Maple Road, Homewood, IL 60430; Phone: 800.829.7879; 708.957.7878; Fax: 708.957.8405.

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

International Association of Milk, Food and Environmental Sanitarians, Inc.
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; Web site: www.iamfes.org

SHIP TO: (Please print or type. All areas must be completed in order to process.)

First Name _____ M.I. _____ Last Name _____

Job Title _____ Company _____

Mailing Address _____

(Please specify: ❒ Home ❒ Work)

City _____ State or Province _____

Postal Code/Zip + 4 _____ Country _____

Telephone # _____ Fax # _____

E-mail _____

IAMFES BOOKLETS

Quantity	Description	Member or Gov't. Price	Non-Member Price	TOTAL
	Procedures to Investigate Waterborne Illness—2nd Edition	$8.00	$16.00	
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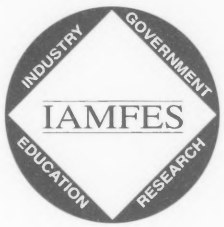

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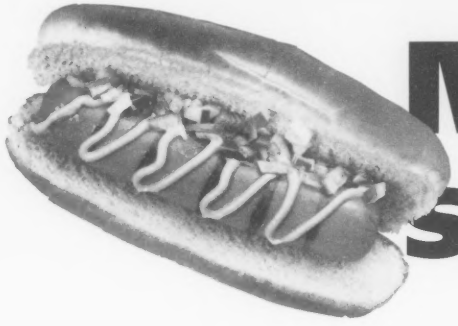

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