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Periodicals

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# Food Protection Trends

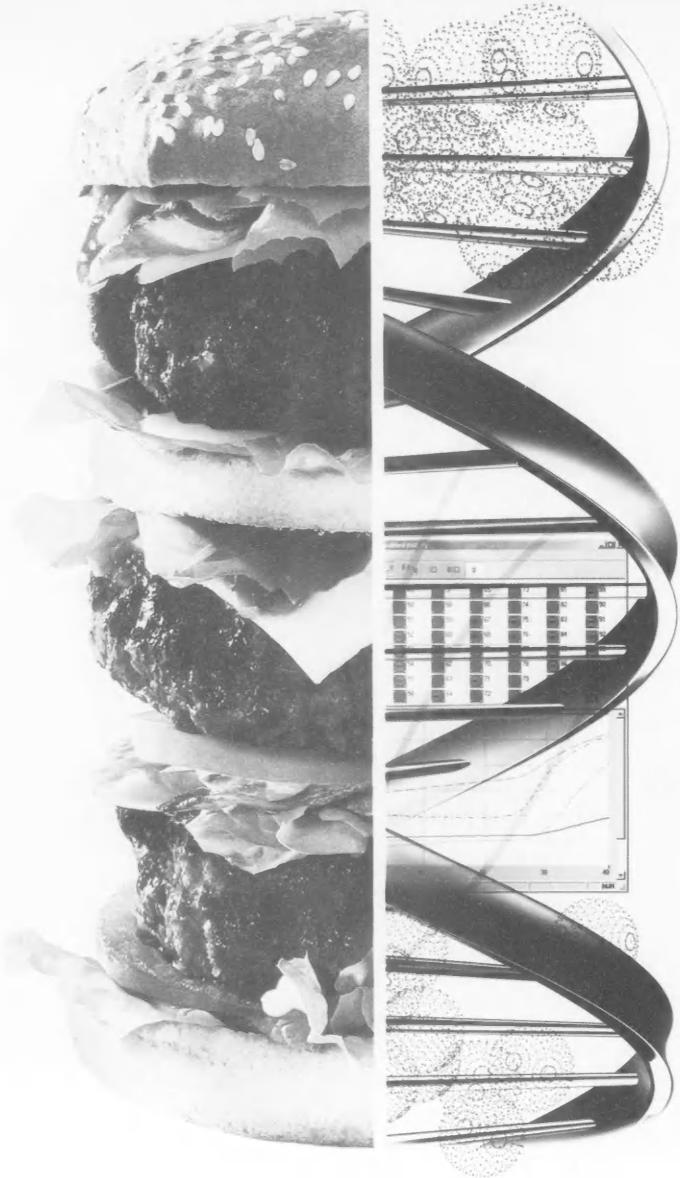
**Science and News** from the International Association for Food Protection



**Use of Linear Models for Thermal Processing  
of Acidified Foods**

**Characterization of Multidrug-resistant  
*Salmonella enterica* Typhimurium Isolated  
from Feedlot Cattle**

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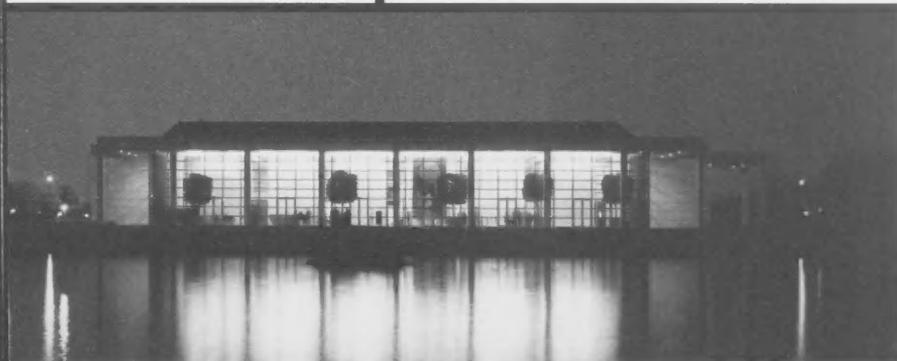
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### FPT JOURNAL STAFF

**David W. Tharp, CAE:** Executive Director  
E-mail: [dtharp@foodprotection.org](mailto:dtharp@foodprotection.org)

**Lisa K. Hovey, CAE:** Managing Editor  
E-mail: [lhovey@foodprotection.org](mailto:lhovey@foodprotection.org)

**Donna A. Bahun:** Production Editor  
E-mail: [dbahun@foodprotection.org](mailto:dbahun@foodprotection.org)

**Pam J. Wanninger:** Proofreader

### INTERNATIONAL ASSOCIATION FOR FOOD PROTECTION STAFF

**David W. Tharp, CAE:** Executive Director  
E-mail: [dtharp@foodprotection.org](mailto:dtharp@foodprotection.org)

**Lisa K. Hovey, CAE:** Assistant Director  
E-mail: [lhovey@foodprotection.org](mailto:lhovey@foodprotection.org)

**Donna A. Bahun:** Design and Layout  
E-mail: [dbahun@foodprotection.org](mailto:dbahun@foodprotection.org)

**Farrah L. Bengel:** Accounting Assistant  
E-mail: [fbengel@foodprotection.org](mailto:fbengel@foodprotection.org)

**Julie A. Cattanach:** Membership Services  
E-mail: [jcattanach@foodprotection.org](mailto:jcattanach@foodprotection.org)

**Donna Gronstal:** Senior Accountant  
E-mail: [dgronstal@foodprotection.org](mailto:dgronstal@foodprotection.org)

**Terri M. Haffner:** Program Coordinator  
E-mail: [thaffner@foodprotection.org](mailto:thaffner@foodprotection.org)

**Karla K. Jordan:** Order Processing  
E-mail: [kjordan@foodprotection.org](mailto:kjordan@foodprotection.org)

**Didi Loynachan:** JFP Editorial Assistant  
E-mail: [dloynachan@foodprotection.org](mailto:dloynachan@foodprotection.org)

**Susan A. Smith:** Association Services  
E-mail: [ssmith@foodprotection.org](mailto:ssmith@foodprotection.org)

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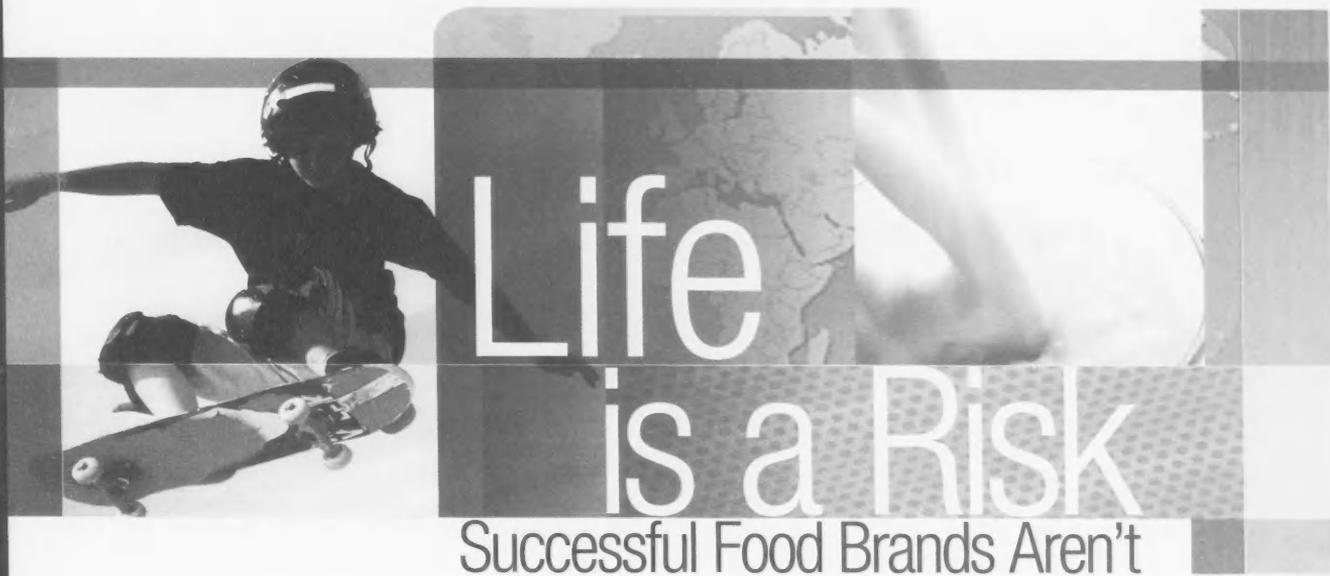
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### SCIENTIFIC EDITOR

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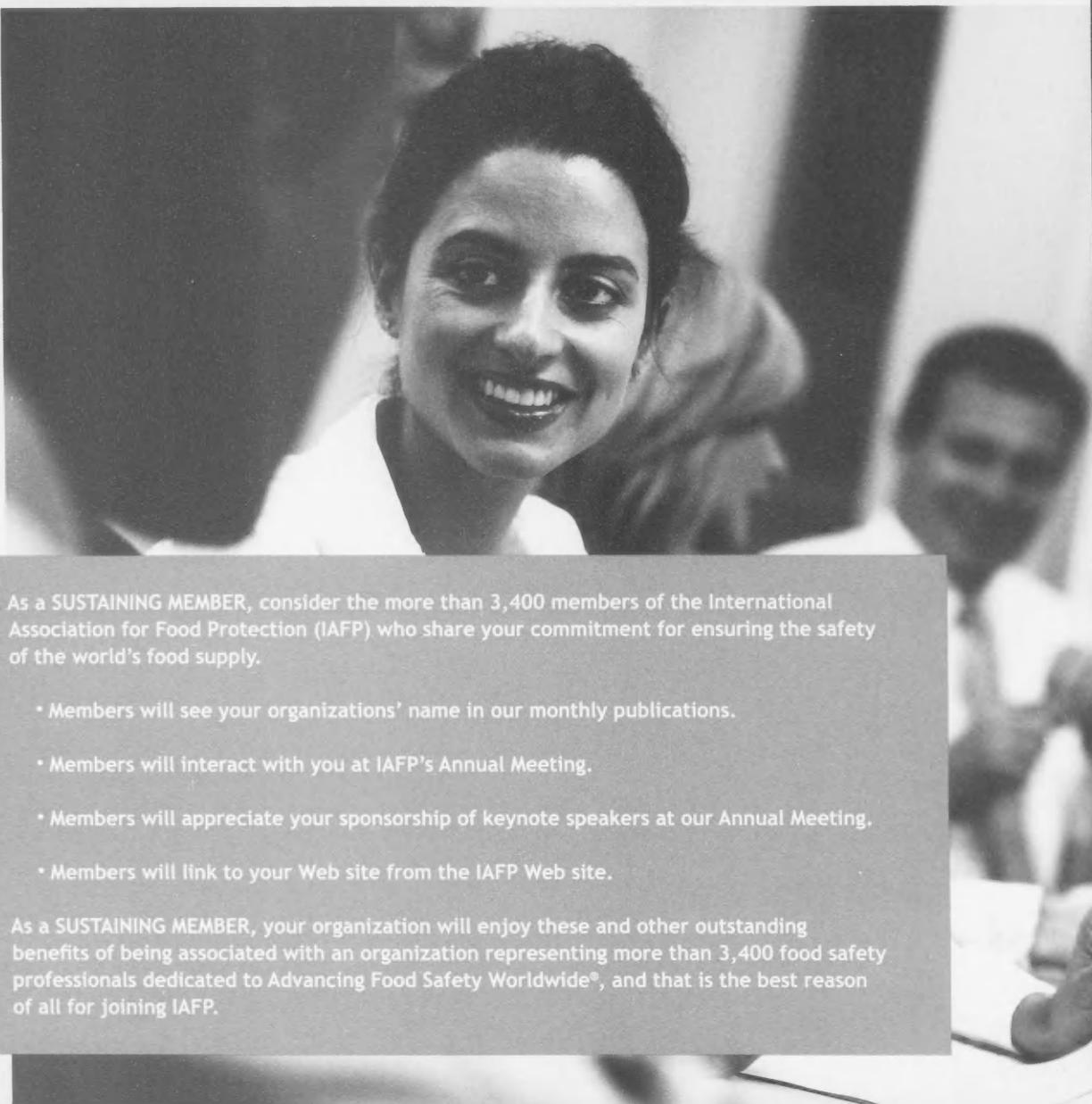


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Group**, Lake Forest Park, WA; www.  
iehinc.com

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Association**, Washington, D.C.;  
www.idfa.org

**Iowa State University Food  
Microbiology Group**, Ames, IA;  
www.iastate.edu

**The Kroger Co.**, Cincinnati, OH;  
www.kroger.com

**Lester Schwab Katz & Dwyer, LLP**;  
Short Hills, NJ; www.lskdnylaw.com

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www.microbiologics.com

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**Micro-Smedt**, Herentals, Belgium;  
www.micro-smedt.be

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Fort Atkinson, WI; www.enasco.com

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Inc.**, Dublin, CA; www.thenfl.com

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WI; www.nelsonjameson.com

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www.neogen.com

**NSF International**, Ann Arbor, MI;  
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Washington, D.C.; www.unitedfresh.org

**Walmart**, Bentonville, AR; www.  
walmart.com

**Walt Disney World Company**,  
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## "VICKIE'S VIEW" FROM YOUR PRESIDENT

**G**reetings to All! Spring has certainly sprung here in Illinois! In fact, I am sitting outside as I write this column, enjoying the first 70+ degree day we have had since September. The arrival of spring brings a lot of changes, new things and new events. My family and I recently attended a spring festival at the boys' school. One of the organized events was "The Cake Walk." The premise of the game is the same as musical chairs; there is a circle of spots, with one spot less than the number of walkers. When the music starts, the children walk around in a circle; when the music stops everyone stops, hopefully on a spot. The child without a spot to stand on is out of the game. The game continues until there is one child left, the winner of a sugary sweet cake! As you can imagine, with a prize like that on the line all of the children were desperate to be the last standing. As the game neared the end there was a lot of fast walking, pushing, a little shoving and the like going on. In the end, neither of my boys won a cake but walked away with a few bruises to show for their efforts! As I watched this event it reminded me a lot of the IAFP Silent Auction held each year at the Annual Meeting. More than once I've walked away empty handed with only bruises to show for my efforts! There really is nothing "silent" about the event and it is more like a sporting event than an auction. I truly look forward to the Silent Auction every year, the items and the mad rush as the clock winds down. The last 15 seconds are analogous to only one spot being left in the cake walk event!

For IAFP the arrival of spring brings about an abundance of new news! The IAFP staff recently said tearful goodbyes to two coworkers; Lani McDonald and Tamara Ford. Both Lani and Tamara have left IAFP for moves out-of-state to pursue other opportunities. At the same time, the staff has welcomed two new people to the



By **VICKIE LEWANDOWSKI**  
PRESIDENT

***"Your participation  
and support of  
the Foundation  
will enable IAFP  
to continue to  
achieve its Mission"***

IAFP office; Susan Smith and Terri Haffner. Susan is replacing Lani and is already hard at work supporting the affiliate needs. Terri has moved into Tamara's position and has jumped in right where Tamara left off in organizing the European Symposium happening June 2010 in Dublin as well as working non-stop on the Annual Meeting to be held August 2010 in Anaheim. We wish Tamara and Lani the best and enthusiastically welcome Susan and Terri!

With spring comes the Secretary election results. Don Schaffner is our new incoming Secretary; please extend

your congratulations to him! At this time we also extend a huge thank you to Maria Teresa Destro for her commitment to our Association as exemplified by her willingness to be a candidate in the election. I would also like to thank all of our committed members who took the time to participate in the election by voting! Spring also reveals the result of the efforts of many of our members' hard work, those who took the time to coordinate award nominations, those who wrote letters of support for a nominee and those who served as jurors, on award committees. I am pleased to be able to report that this year we had a nomination for every award! Thanks to all of you who recognized your colleagues. The award winners will be announced soon.

Each spring we also have the honor of awarding Student Travel Scholarships. Please join us in congratulating these scholarship recipients:

- Abel Atukwase, Makerere University, Uganda
- Mary Pia Cuervo, Texas A&M, USA
- Vania Ferreira, Portuguese Catholic University, Portugal
- Clyde Manuel, Colorado State University, USA
- Csaba Nemeth, University of Budapest, Hungary
- Anh Linh Nguyen, University of New South Wales, Australia
- Iryna Sybirtseva, North Carolina State University, USA
- Duygu Tosun, Ege University, Turkey

The Student Travel Scholarships are funded from the IAFP Foundation. The Foundation also supports the Ivan Parkin Lecture, the John H. Silliker Lecture, Annual Meeting speaker travel support, the Developing Scientist Competition and shipment of *JFP* and *FPT* journals to developing countries through FAO. The Foundation is

currently funded through contributions from corporations and individuals.

A large portion of the support is provided from the Sustaining Membership of IAFP. The Sustaining Membership Program is a unique way for organizations to partner with the Association. There are three levels of Sustaining Membership: Gold (\$5,000/year), Silver (\$2,500/year) and Sustaining (\$750/year). We currently have 18 Gold memberships, 12 Silver memberships and 75 Sustaining memberships. Sustaining Members receive all the benefits of Association Membership plus discounts on advertising and exhibit space, depending on their level of support. Members can designate an individual or individuals, depending on level, from within their organization to receive all the benefits of IAFP membership. For more information, please go to the IAFP Web site at <http://www.foodprotection.org/membership/types-of-membership/sustaining/>.

Support from individuals is also crucial to the Foundation. Contributions, big or small, make a positive impact on the Fund and subsequently an impact on the programs it supports. One of the easiest and most fun ways to make an individual contribution is by donating an item to the Silent Auction. That's right, proceeds from the "brutal" event I referred to earlier goes to the IAFP Foundation.

You can contribute to the IAFP Foundations' Silent Auction today by contacting Donna Gronstal via E-mail ([dgronstal@foodprotection.org](mailto:dgronstal@foodprotection.org)) or phone (+1 515.276.3344 or +1 800.369.6337). The items in past auctions have ranged from t-shirts to jewelry to an antique microscope, with a lot of wine and food in between! Following is a sample of items donated last year:

- 3M Food Safety Gift Box
- "Taste of Chicago" Gift Certificates
- "Experience Atlanta" Gift Basket
- Rosemary's Garden Bath & Body Products
- 2010 Annual Meeting Registration
- Jimmy Buffet Autographed Album
- Cultured Freshwater Pearl Necklace w/Sapphire and Silver Clasp
- JFP On-A-Stick (Back Issues)
- Y'all Come Eat - Signed by Paula Deen
- Author Signed Scientific Text Books
- 10 lb Nestle Crunch Bar

Be sure to stop by the Silent Auction at the Anaheim meeting and let the bidding begin!

Of course there are some who share the philosophy of Steven Spielberg (American Film director and producer), "Why pay a dollar for a bookmark? Why not use the dollar for a bookmark?" Why buy an item for the Silent Auction to support the Foundation?

Why not donate that money directly instead? Go for it! You can easily make an individual general donation. In addition to making a general donation, IAFP is pleased to now be able to offer our supporters the ability to make a donation as a Tribute or a Memorial Donation instead! If the donation is a Tribute or Memorial, there is an option to send a card. For more information, contact David Tharp via E-mail ([dtharp@foodprotection.org](mailto:dtharp@foodprotection.org)) or phone (+1 515.276.3344 or +1 800.369.6337).

In addition to the Silent Auction, each year at the Annual Meeting there is also a special fundraising event for the Foundation. This year we will be incorporating the Foundation fundraising event with the golf outing. We are looking for sponsorship in the form of money and or prizes for this event. This is a great opportunity for a company or organization. There are 18 holes available to sponsor, various contests (closest to the pin, longest putt, longest drive, etc.). This is IAFP's first time holding this event as a fundraiser and we need your help to make this a fun and successful event. Any and all ideas are welcomed. Please reach out to me or the IAFP staff with your ideas. Your participation and support of the Foundation will enable IAFP to continue to achieve its Mission; to provide food safety professionals worldwide with a forum to exchange information on protecting the food supply. As always, you can reach me directly by E-mail at [VLewandowski@kraft.com](mailto:VLewandowski@kraft.com).

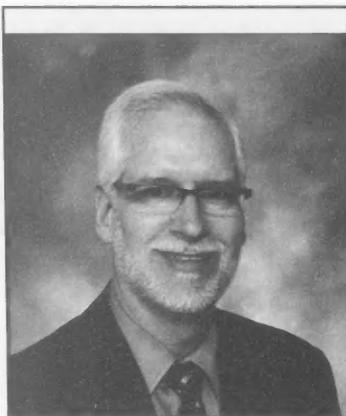
## “COMMENTARY” FROM THE EXECUTIVE DIRECTOR

Many times I am asked how IAFP decides on our meeting locations, whether it be Annual Meeting, our European Symposium or the International Symposium. It might be good to review our procedures to familiarize you with our selection process.

For the IAFP Annual Meeting, we are normally working on site selection four to five years in advance of the actual meeting taking place. We have found that this ensures our ability to find locations that match well with the needs of our meetings and attendees. For instance, at the current time we are working to finalize contracts for IAFP 2014 and have begun the city selections for IAFP 2015.

We begin the selection process with a Board review of where we have been (prior meeting locations) and where we will be meeting in the upcoming years. By looking at those locations, we can then assess if there is an area of the country that we have not recently held a meeting or do not have plans to hold a meeting in for a number of years. Our “unwritten rule” is to not return to the same city or state for a 10-year period. We also avoid returning to the same facilities within a city where we have previously met. By adhering to these “guidelines,” we feel our Annual Meeting attendees are able to experience new cities and exciting properties each and every year.

Once a review of our past and near future locations is completed, we can then properly look to the future. In an Executive Board discussion, regions of the country are discussed and advantages of each are addressed. The Board ends their discussion with a short list of cities to be considered. It should also



By **DAVID W. THARP, CAE**  
EXECUTIVE DIRECTOR

***“We feel our  
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be stated that IAFP avoids holding successive meetings in the same geographic region. For instance, we do not want to hold a meeting in Orlando followed by a meeting in Atlanta. It is our preference to move it around the country to allow for variety and ease of access for Members around North America and the world.

At the point where the Board develops a list of cities, IAFP staff then conducts a search of facilities in those cities and arrives at viable options for the Board to consider. After this Board discussion and arriving at a more defined direction, staff continues to focus in on a specific city or facility to arrive at contractual agreements. It is a long process, but one that has proven to provide a good variety of facilities in many interesting cities around North America. We are fortunate to be of a size where we have many options for facilities to accommodate our Annual Meeting needs. Although we have outgrown most single facility properties, we have found many new opportunities that offer new areas to explore!

For our European Symposium, we rely on the organizing committee to give us direction on where to establish our meeting site. In years past, we held this symposium during the fourth quarter of the year and that was somewhat limiting on acceptable locations. This year, we moved the symposium to June and will hold the event in Dublin. In the future, we hope to be able to establish at least a two-year list of future locations but at present, we are still planning one-year at a time in Europe.

We have seen an increased interest in the European Symposium and have worked to spread the news about IAFP's efforts in Europe. If you have colleagues in Europe who could participate we hope you will encourage their active involvement in IAFP's European Symposium. This can help to further their contact list within Europe and beyond.

To conclude, let me review our International Symposium and

how it is developed. Currently, we are working on the Third International Symposium on Food Safety to be held September 21–24 in Bogota, Colombia. This International Symposia and our past symposia held in Seoul, Korea and Campinas, Brazil have been fully organized with the direct assistance of our Affiliate organizations in these countries. They establish the program, the facilities, location and contract for all services. We have found this to be the best process to follow since they know the local business practices and customs.

Both the Campinas and Seoul Symposia were very successful and helped to bring IAFP's spirit of providing food safety professionals worldwide with a forum to exchange information on protecting the food supply to those countries. We look forward to the unique opportunities presented by the upcoming Bogota Symposium and hope to see many new and current IAFP Members this September!

To date, our efforts with the International Symposia have been organized around the goal of holding

a symposium in Latin America every other year, then holding the alternating year in another region of the world. We anticipate being able to grow our international participation around the globe by becoming more and more visible in areas where IAFP Affiliate organizations reside.

Should you have any questions about IAFP's meeting structure, feel free to contact me through the IAFP office. We look forward to the opportunity to welcome you to one or more of IAFP's meetings in the future!

# *Announcing*

*IAFP's New Professional Development Groups  
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International Association for  
**Food Protection.**

# Use of Linear Models for Thermal Processing of Acidified Foods

FREDERICK BREIDT,<sup>1</sup> K. P. SANDEEP<sup>2</sup> and FLETCHER M. ARRITT\*<sup>2</sup>

<sup>1</sup>USDA/ARS, 322 Schaub Hall, North Carolina State University, Raleigh, NC 27603-7624, USA;

<sup>2</sup>Dept. of Food, Bioprocessing, and Nutrition Sciences, 129 Schaub Hall, North Carolina State University, Raleigh, NC 27695-7624, USA

## ABSTRACT

Acidified vegetable products with a pH above 3.3 must be heat processed to assure the destruction of *Escherichia coli* O157:H7, *Salmonella enterica*, *Listeria monocytogenes*, and other pathogenic bacteria that might be present in the product. Recently, the Food and Drug Administration has required that linear models for heat process data be used with electronic process filing forms. Existing recommendations for heat processing acidified vegetables are based on non-linear (Weibull and exponential decay) models. We report here the parameters for a linear model that meets or exceeds the established heat processing conditions needed to assure safety.

## INTRODUCTION

Acid and acidified foods are partially defined in the Code of Federal Regulations as foods having a final equilibrium pH at or below 4.6 (21 CFR part 114), with a water activity of 0.85 or greater. Fermented and refrigerated products are excluded from this regulation. The pH 4.6 value was based on data show-

ing that spores of *Clostridium botulinum* will not germinate and produce neurotoxin at or below pH 4.6 (6). Acid foods include, among other things, fermented vegetables such as cucumber pickles or sauerkraut, which naturally have a pH below 4.6. Acidified foods achieve pH 4.6 or lower by the addition of an acidulant (typically acetic acid) or acid food

ingredients. Acidified foods include most fresh pack cucumber pickle and pepper products.

Fermented cucumber pickles are primarily sold to customers who purchase hamburger dill pickle slices on a wholesale basis. Fermented pickles are excluded from regulation in 21 CFR part 114 because a variety of antimicrobial metabolites (such as organic acids, peroxides, antimicrobial peptides) that eliminate vegetative pathogens are produced during fermentation (5). The retail market, however, is dominated by acidified shelf stable pickled vegetables (fresh pack products), including cucumber pickles, peppers and other vegetables. Acetic acid is commonly used as the primary acidulant in these products. The pH of acidified cucumber pickles is typically between 3.4 and 4.1. At this pH, the survival of acid resistant bacterial pathogens (*Escherichia coli* O157:H7, *Salmonella enterica*, and *Listeria monocytogenes*) that may be present on fresh vegetables is a concern. While these pathogens do not grow in acidified vegetables, they may survive long enough to cause disease (2).

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\*Author for correspondence: Phone: 919.513.0176; Fax: 919.515.7124

E-mail: fletcher\_arritt@ncsu.edu

**TABLE 1. D values from TDT data**

Temp (°C)	R <sup>2</sup>	D value <sup>a</sup>
50	0.96	17.65 (0.91)
52	0.94	12.58 (0.68)
54	0.86	7.34 (0.70)
56	0.90	4.31 (0.45)
58	0.98	1.37 (0.034)
60	0.97	0.58 (0.023)

<sup>a</sup>One log reduction time (min.); standard error for each value is shown in parentheses.

**TABLE 2. Z and F Values**

Model <sup>a</sup>	Z value (°F)	F <sub>160</sub> <sup>b</sup>
Exp. Decay (5SE)	19.50	1.20
Exp. Decay	15.70	0.34
Five D Model	11.98	0.08
One D Model	11.98	0.02

<sup>a</sup>Models as described in the text: Exp. Decay (5SE), exponential decay model with five times the standard error added; Exp. Decay, exponential decay model; Five D Model, linear model based on a five log reduction; One D Model, linear model based on a one log reduction.

<sup>b</sup>F<sub>160</sub>: Time in minutes (F value) needed to achieve the predicted reduction in cell numbers at a reference temperature of 160°F.

The infectious dose for *E. coli* O157:H7 may be as low as one to ten cells. For this reason, acidified vegetables must be processed to assure a five log reduction in acid resistant pathogenic bacteria.

The details of the processes that are needed to assure safety of acidified vegetables are included in process filings, which manufacturers file with the Food and Drug Administration (FDA). There are two kinds of processes that have been shown to assure a five log reduction in acid resistant pathogens. The acid present in some products may be sufficient to assure a five log reduction in numbers of acid resistant pathogens. For this reason, products with acetic acid as the primary acidulant and a pH below 3.3 do not require a heat process, but do require a temperature dependent holding time to

assure safety (3). *E. coli* O157:H7 has been found to be the most acid resistant pathogen of concern for these products (3). To achieve a five log reduction at 77°F (25°C), a holding time of 48 hours is needed. However, at 50°F (10°C), a holding time of six days is required for a five log reduction. Interestingly, *L. monocytogenes*, a psychrotrophic organism, which can grow at refrigeration temperatures at neutral pH, does not survive as well as *E. coli* O157:H7 under similar cold and acidic conditions (3).

For products with a pH above 3.3, heat processes needed to assure a five log reduction in vegetative bacterial pathogens in acidified vegetable products have been published (4). The processing conditions were determined using a Weibull

model, because, in some cases, non-linear kinetics were observed for the thermal destruction of the *E. coli* O157:H7, *Salmonella*, and *Listeria* strains used in the study. For required process filing forms, FDA has recently requested that a linear model be used for the thermal destruction of vegetative pathogens. The use of linear model parameters (Z and F-values, reference temperature, and a least sterilizing value) allows a comparison of processes for both low acid canned food processes and acidified foods.

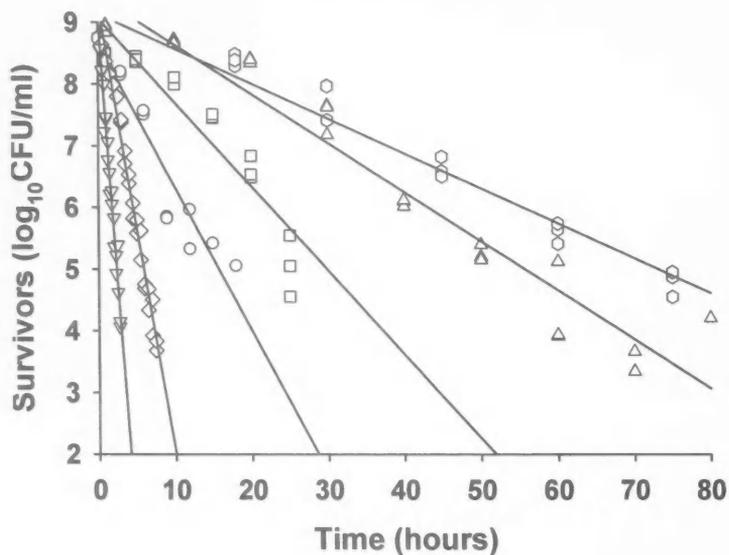
There are some differences, however, between the methods for processing low acid canned foods and acidified pickled vegetable products. In heat processed acidified foods, spores are not inactivated. Pathogenic spore outgrowth is prevented by maintaining the pH at or below 4.6. The objective in heat processing acidified foods is to eliminate vegetative cells of microbial pathogens and spoilage microorganisms capable of surviving in the product. A five log reduction in *E. coli* O157:H7 cell numbers is sufficient for assuring safety of acidified foods, similar to the juice HACCP regulations (21 CFR part 120). Another difference between low acid canned foods and acidified foods is that most acidified foods are heat processed in multi-stage pasteurizers that have several different temperatures, unlike a sealed retort with a fixed temperature. Most processors remove jars from pasteurizer segments and manually determine the internal temperature to confirm that the appropriate center temperature for a given process has been achieved. The time-temperature conditions needed for a five log reduction in bacterial pathogens occur within an internal segment of the pasteurizer, after the containers have been pre-heated.

To meet published safe processing conditions (4) and allow electronic filling of acidified food processes, a new linear model is needed. We describe a linear model that meets or exceeds the published times and temperatures required for achieving a five log reduction of *E. coli* O157:H7 and other vegetative pathogens that may be present in acidified vegetable products.

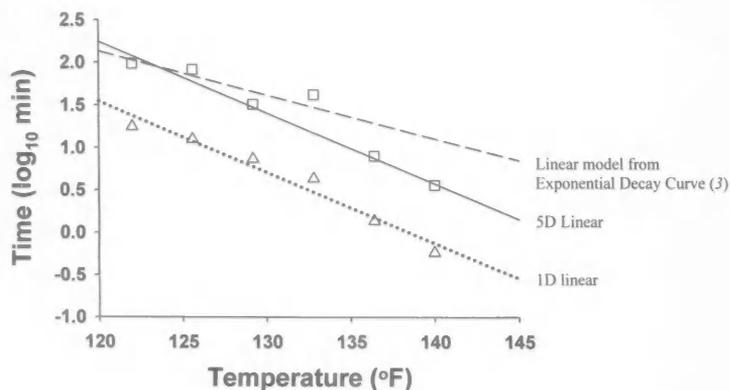
## MATERIALS AND METHODS

Modeling of microbial heat kill data was based on the F-value method

**FIGURE 1.** D values for existing TDT data. Temperatures for each data set are shown on the graph in °C. Data for three replicates at the indicated times for 50°C (122°F, octagons), 52°C (126°F, triangles), 54°C (129°F, squares), 56°C (133°F, circles), 58°F (136°F, diamonds), and 60°C (140°F, inverted triangles) are shown. Regression lines for each data set are shown next to the corresponding temperature number.



**FIGURE 2.** Processing times based on three different models. The triangles represent the  $\log_{10}$  of the D values determined for the linear model as described in the text. The squares represent the published Weibull five log reduction data with five times the standard error added. The regression lines are as follows: dotted line, from the one log reduction values (triangles); solid black line, five log reduction times; dashed black line, exponential decay model with five times the standard error added.



(1), and the D and Z values were determined by two approaches. The first approach was to develop a linear model based on the published five log reduction times that were originally determined by a non-linear (Weibull) model (4). A log-linear transformation of the published five log reduction times (generated by use of the Weibull model) was plotted against temperature. Linear regression was then carried out to determine a Z value from the slope of the regression line. In the second approach, the existing thermal death time (TDT) raw data (4) was re-examined using a linear model instead of a Weibull model. Linear regression of  $\log_{10}$  surviving cells vs. time, and  $\log_{10}$  D values vs. temperature, to determine D and Z values (respectively), was carried out. All regression calculations were performed with SigmaPlot software (Version 10.0, Systat Software, Inc, Chicago IL). For both methods, 160°F was chosen as a reference temperature.

## RESULTS

The D values for a temperature range of 50°C (122°F) to 60°C (140°F) were generated by use of a linear model with the existing TDT data (Fig. 1). Based on these D values (Table 1), a Z value of 11.98°F was determined for *E. coli* O157:H7. For a reference temperature of 160°F, a processing time of 0.016 min. was determined for the linear model (Fig. 2). The five log reduction line from these data has the same slope and Z value, but the processing time at the reference temperature of 160°F was 0.08 min (Table 2). The  $R^2$  value for the log-linear regression to determine the Z value was 0.96 (Fig. 2).

Previously, Breidt et al. (4) used a Weibull model and an exponential decay function to predict five log reduction times. The predicted values from an exponential decay model were used to determine safe processing times for temperatures between 160°F and 180°F (4). Recommendations for safe processing times for industry included the addition of five times the standard error to the predicted processing times. From these data, a linear model was used to fit the predicted values from the exponential decay model by taking the  $\log_{10}$  of the predicted

**TABLE 3. Recommended heat processing time/temperature combinations for a 5-log reduction in bacterial pathogens for acidified products with a pH of 4.1 or below**

Temp (°F)	Time (min.)	Temp (°F)	Time (min.)
140	12.7	161	1.1
141	11.3	162	0.9
142	10.1	163	0.8
143	8.9	164	0.7
144	7.9	165	0.7
145	7.1	166	0.6
146	6.3	167	0.5
147	5.6	168	0.5
148	4.9	169	0.4
149	4.4	170	0.4
150	3.9	171	0.3
151	3.5	172	0.3
152	3.1	173	0.3
153	2.7	174	0.2
154	2.4	175	0.2
155	2.2	176	0.2
156	1.9	177	0.2
157	1.7	178	0.1
158	1.5	179	0.1
159	1.4	180	0.1
160	1.2	181	0.1

curve (Fig. 2). The Z values determined for each model are shown in Table 2. The recommended time-temperature processing conditions from the log-linear transform of the exponential decay data are shown in Table 3. The Z value for these data was 19.5°F with an F value of 1.2 min. at a reference temperature of 160°F.

## DISCUSSION

Recently, FDA has returned process filings because of a lack of a Z, F and least sterilizing value as well as a reference temperature on the filing forms. Linear kinetic parameters were desired for comparison with other ther-

mal processes for a wide variety of food products. The original data used to generate the published five log reduction times for *Salmonella*, *Listeria*, and *E. coli* O157:H7 included non-linear heat killing curves. Fitting the non-linear curves with a linear model resulted in significant under-processing, compared to the published five log reduction times.

An alternate approach, using a linear approximation of the existing five log reduction values generated from a non-linear (Weibull) model, resulted in a model that would assure safety, based on the published data. This model has an F value of 1.2 min., a Z value of 19.5°F, and a reference temperature of 160°F (Table 2). These conservative

processing time-temperature conditions (Table 3) are well below the times and temperatures used for many commercial processes for shelf stable acidified foods. For example, a processing temperature of 165°F (74°C) for 15 min. was recommended by Monroe et al. (7) for fresh-pack dill pickles for microbial stability and quality factors, including the inactivation of softening enzymes. Typical industry practices therefore have a large margin of safety. The linear model described here predicts the minimum times and temperatures needed for safety, in terms of the destruction of *E. coli* O157:H7, *Salmonella*, and *Listeria*, and can be used with either FDA electronic or paper filing forms.

## ACKNOWLEDGMENTS

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## Congratulations...

In March 2010, the International Association for Food Protection participated at the 2010 Food Safety Education Conference in Atlanta, Georgia. While exhibiting, we offered a free drawing for a one-year membership with our association. We are pleased to announce the following winner of the drawing:

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Canton, Georgia

# Characterization of Multidrug-resistant *Salmonella enterica* subsp. *enterica* Serovar Typhimurium var. Copenhagen and Typhimurium Isolated from Feedlot Cattle

EBOT S. TABE,<sup>1</sup> JAMES OLOYA,<sup>2</sup> DAWN K. DOETKOTT<sup>1</sup> and MARGARET L. KHAITSA<sup>1\*</sup>

<sup>1</sup>Dept. of Veterinary and Microbiological Sciences, North Dakota State University, 1523 Centennial Blvd., Fargo, ND 58105–5406, USA; <sup>2</sup>Dept. of Epidemiology and Biostatistics, University of Georgia, 235B Paul D. Coverdell Center, Athens, GA 30602–0001, USA

## ABSTRACT

The objective of this study was to characterize *Salmonella enterica* subsp. *enterica* Serovars Typhimurium and Typhimurium var. Copenhagen isolated from naturally infected feedlot cattle ( $n = 138$ ) in North Dakota for antimicrobial resistance (AMR), presence of integrons and genotypic relatedness by use of PFGE assays. A panel of 15 selected antimicrobials and the Sensititre automated antimicrobial susceptibility test system (TREK Diagnostic Systems, Westlake, OH) were used. Class 1 and 2 integrons were targeted by PCR, using primers specific for the *int1* and *int2* genes. Pulsed field gel electrophoresis (PFGE) assays were performed by the *E. coli* Reference Center, Pennsylvania State University, University Park, PA. All 58 *Salmonella* isolates tested were resistant to  $\geq 1$  of the antimicrobials, with 56/58 (96.6%) showing multidrug resistance (resistant to  $\geq 2$  antimicrobials). Twenty-nine (26 of which were *Salmonella* serovars Typhimurium var. Copenhagen) were positive for class 1 integron; two also tested positive for integron 2. The 58 *Salmonella* isolates were grouped into 9 distinguishable PFGE profiles, with the most prevalent genotype accounting for 46.6% (27/58) of the isolates. The predominant resistance phenotype (94.8%, 55/58) was Amox/Cla-Amp-Chl-Str-Sul-Tet. In addition, these data indicate that *Salmonella enterica* subsp. *enterica* Serovars Typhimurium and Typhimurium var. Copenhagen *Salmonella* isolated from naturally infected feedlot cattle in North Dakota showed widespread AMR, with or without presence of class 1 integron.

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\*Author for correspondence: Phone: 701.231.5946; Fax: 701.231.7514  
E-mail: Margaret.Khaitsa@ndsu.edu

## INTRODUCTION

Foodborne diseases caused by nontyphoid *Salmonella* represent an important public health problem and an economic burden in many parts of the world today (11, 18, 27). In the United States (US), *Salmonella* is the second most common identifiable cause of illness, and the leading cause of hospitalizations and deaths, due to foodborne bacterial infection (17). Most people who suffer from *Salmonella* infections present with temporary gastroenteritis that usually does not require treatment. However, when infection becomes invasive, antimicrobial treatment is mandatory (29). Traditionally, ampicillin, chloramphenicol, and trimethoprim-sulfamethoxazole have been used to treat such severe cases. However, the increasing number of antimicrobial-resistant *Salmonella* strains has led to a decrease in the efficacy of these treatments (2). Additionally, the frequency of isolation of *Salmonella* strains resistant to one or more antimicrobial agents has risen in the US (7), and elsewhere in the world (1). Fluoroquinolones and broad-spectrum cephalosporins have been employed most recently as the preferred drugs for treatment of adults and children, respectively, due to the low likelihood of resistance to them (2, 4). However, the usefulness of these drugs may be diminishing, as *Salmonella* strains producing  $\beta$ -lactamases conferring resistance to broad-spectrum cephalosporins have been isolated from clinical patients (6, 29); some of these microorganisms have been acquired from cattle (8). The situation is reported to be more complex and difficult in developing countries in which there is a widespread misuse of antimicrobials in both human and veterinary medicine practices (21). This uncontrolled exposure to combinations or several classes of antimicrobials has led to the emergence of multidrug-resistant (MDR) strains that may pass from food animals to humans (7).

The spread of antibiotic resistance among bacteria has been associated with mobile genetic elements such as plasmids, transposons (30) and integrons (19). Notably, MDR has been frequently linked with microbial genomic elements known as integrons, which have the ability to distribute genes encoding resistance to a number of antimicrobial drugs (19). Integrons can capture genes, notably those encoding antimicrobial resistance,

by a site-specific recombination system and have been located in both chromosomal and extra chromosomal DNA (3, 12). The main classes of integrons are found in the family *Enterobacteriaceae*, with class 1 integrons being the most extensively studied. Class 1 integrons are characterized by the presence of two conserved segments, the 5'-conserved segment (5'-CS) and 3'-conserved segment (3'-CS) (3), and are defined by an *intI* gene encoding integrase, a recombinant site *attI*, and a strong promoter. Previous studies (30, 31) on integrons and associated antimicrobial resistance genes in *Salmonella* revealed a predominance of gene cassettes that confer resistance to aminoglycosides and trimethoprim. The investigation of multidrug-resistance in foodborne pathogens in general and *Salmonella* in particular is essential for a more complete understanding of the epidemiology of emerging multidrug resistance in *Salmonella* serovars (31). The implication of therapeutic failure in public health due to multidrug resistance is particularly important, given that *Salmonella* is the leading cause of foodborne infection in the US (17).

This study reports on the association between the presence of integrons (Class 1 and 2) and MDR in *Salmonella* serovars isolated from naturally infected feedlot cattle housed at the North Dakota State University (NDSU) cattle feedlot research facility.

## MATERIAL AND METHODS

### Sample collection

Fecal samples were collected from each steer in accordance with the guidelines established by the Institute for Animal Care and Use Committee (IACUC), following a previously described protocol (13). Briefly, each steer was restrained in a hydraulic chute, and about 20 g of feces was collected from the rectum. A new set of sterile polythene sleeve gloves was used for collection from each steer. The feces were put into sterile plastic cups that were placed on ice to be transported to the laboratory at NDSU for processing. In addition, a sterile dry cotton swab was used to culture the dorsal mucosa of the rectoanal junction (RAJ). Each RAJ mucosal swab was placed into a 15 ml culture tube containing 3 ml of Trypticase Soy Broth (Difco™ Becton Dick-

inson & Company MD, USA) supplemented with cefixime and potassium tellurite (Dynal Biotech ASA, Oslo, Norway). Both the fecal samples and swabs were placed in iced-pack coolers before being transported to the laboratory. The sampling procedure was repeated every three weeks for the entire finishing period (March – June, 2007) and has been described in detail elsewhere (26).

### Isolation of *Salmonella*

Fecal samples were cultured by use of conventional culture methods optimized for the detection of *Salmonella* (14). Briefly, a sterile swab was loaded with fecal sample, which was pre-enriched in buffered peptone water (Difco™ Becton Dickinson & Company, MD) at 37°C overnight; this was followed by immunomagnetic bead separation specific for *Salmonella* species (Dynabeads® anti-*Salmonella*, Dynal Biotech, Inc., Lake Success, NY) according to the manufacturer's instructions. After the final wash, the beads were transferred to 10 ml of Rappaport Vassiliadis R10 (RV) broth (Becton Dickinson, Sparks, MD) and incubated (with constant gentle shaking) at 42°C for 24 h. Following incubation, the RV cultures were streaked onto modified brilliant green agar (mBGA) (Becton Dickinson) and mannitol lysine crystal violet brilliant green agar (MLCB) (Oxoid LTD, Basingstoke, UK). Colonies with typical *Salmonella* characteristics were stabbed and also inoculated on the surface of 10 ml triple sugar iron agar slants (Becton Dickinson), and biochemical results were read after 24 hours incubation.

### Serotyping and antimicrobial susceptibility testing

Serotyping of *Salmonella* isolates was performed at the National Veterinary Laboratory Services (NVSL) at Ames, Iowa, following standard methods. The antimicrobial susceptibility test of *Salmonella* isolates was determined on a panel of 15 selected antimicrobials by use of the Sensititre automated antimicrobial susceptibility test system (TREK Diagnostic Systems, Westlake, OH) according to the manufacturer's instructions. The MIC breakpoint levels and concentrations of each antimicrobial were based on those specified by the

**TABLE 1. Number (%) of *Salmonella* isolates resistant/susceptible to various antimicrobial agents tested. (Results for Cefotiofur were not interpretable)**

Antibiotics	Susceptible Isolates (%)	Intermediate Isolates (%)	Resistant Isolates (%)
Amikacin (0.5–64)	58 (100.0)	-	-
Amoxicillin/clavulanic acid (1/0.5–32/16)	2 (3.5)	1 (1.7)	55 (94.8)
Ampicillin (2–32)	2 (5.3)	-	56 (94.7)
Cefoxitin (0.5–32)	58 (100.0)	-	-
Ceftriaxone (0.25–64)	58 (100.0)	-	-
Cefotiofur (0.5–8)	NI	NI	NI
Chloramphenicol (2–32)	-	2 (5.3)	56 (94.7)
Ciprofloxacin (0.015–4)	58 (100.0)	-	-
Gentamycin (0.25–16)	58 (100.0)	-	-
Kanamycin (6–64)	58 (100.0)	-	-
Nalidixic acid (0.5–32)	58 (100.0)	-	-
Streptomycin (32–64)	NI	NI	56 (94.7)
Sulfizoxazole (16–512)	2 (5.3)	-	56 (94.7)
Tetracycline (4–32)	2 (5.3)	-	56 (94.7)
Trimethoprim-sulfamethoxazole (4–76)	58 (100.0)	-	-

National Committee for Clinical Laboratory Standards (20). The 15 different antimicrobials used were amikacin (0.5–64 µg ml<sup>-1</sup>), amoxicillin/clavulanic acid (1/0.5–32/16 µg ml<sup>-1</sup>), ampicillin (2–32 µg ml<sup>-1</sup>), cefoxitin (0.5–32 µg ml<sup>-1</sup>), cefotiofur (0.12–8 µg ml<sup>-1</sup>), ceftriaxone (0.25–64 µg ml<sup>-1</sup>), chloramphenicol (2–32 µg ml<sup>-1</sup>), ciprofloxacin (0.015–4 µg ml<sup>-1</sup>), gentamycin (0.25–16 µg ml<sup>-1</sup>), kanamycin (6–64 µg ml<sup>-1</sup>), nalidixic acid (0.5–32 µg ml<sup>-1</sup>), streptomycin (32–64 µg ml<sup>-1</sup>), sulfizoxazole (16–512 µg ml<sup>-1</sup>), tetracycline (4–32 µg ml<sup>-1</sup>) and trimethoprim-sulfamethoxazole (0.12/ 2.4– 4/76 µg ml<sup>-1</sup>).

#### Pulsed field gel electrophoresis (PFGE)

The *Salmonella* isolates recovered from this study were sent to the *E. coli* Reference Centre, Pennsylvania State University, University Park, PA. PFGE assays were performed on 58 *Salmonella* serotypes to investigate

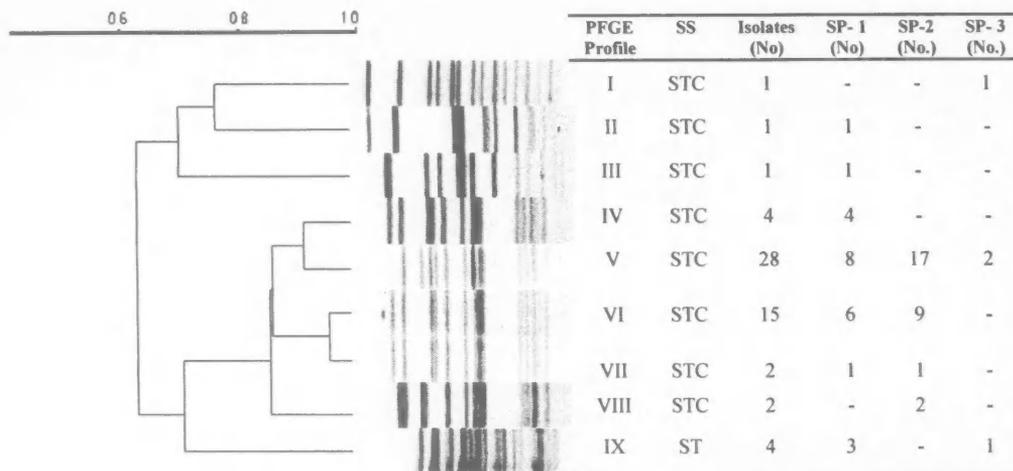
their genotypic relatedness. The sample preparation, restriction digestion, electrophoresis, and gel staining for PFGE were accomplished following the CDC-referenced standard method. Restriction endonuclease *Xba*I (Roche Diagnostics Corporation, Indianapolis, IN) was used for restriction digestion of cDNA. The size standard used for all gels was *Xba*I-digested DNA from *Salmonella* Braenderup strain H9812 (American Type Culture Collection catalog no. BAA-664), i.e., the universal size standard used by all PulseNet laboratories. Fingerprints were analyzed by use of BioNumerics software version 3.5 (Applied Maths, Austin, Texas). Strain relatedness was done based on previously recommended criteria (10), using “different bands” algorithm for clustering and the unweighted pair group for arithmetic means (UPGMA) tree-building approach with optimization of 1 and 0.5% position tolerance. Visual inspection of the patterns was performed as the final step of analysis.

#### PCR amplification of class 1 and 2 integrons

The bacterial DNA template preparation and the PCR conditions for the detection of class 1 and class 2 integrons were undertaken as previously described (18). The screening for the presence of class 1 and class 2 integrons was carried out using PCR with primers specific for the *int1* (13) and *int2* (10). Amplifications were performed in 10 µL of 5× Taq PCR Master Mix (Promega, Madison, WI, USA), µl dntp 2pmol/L each primer, and 2 µg template DNA. Amplification specifications were as follows: 5 min at 94°C followed by 35 cycles of 1 min at 94°C, 1 min at 55°C, and 30 s at 72°C. PCR products were analyzed by gel electrophoresis with 2% agarose gels. Both negative and positive controls were used in the PCR reactions. In addition, a standard DNA ladder (Promega, Madison, WI, USA) was used on the gels.

**FIGURE 1.** Dendrogram generated from the *Xba*I patterns of the 58 *Salmonella* isolates using UPGMA clustering analysis with the BioNumerics software. A positive tolerance of 1.5% was chosen.

### Percent similarity



SS= *Salmonella* Serovar; SP= Sampling points; STC= *Salmonella* Typhimurium serovar Copenhagen; ST= *Salmonella* Typhimurium.

## RESULTS

### *Salmonella* serotypes and antimicrobial susceptibility testing

A total of 54 of 58 (93.1%) of the *Salmonella* species belonged to the serotype Typhimurium vars Copenhagen. The rest (4/58, 6.9%) were *Salmonella* Typhimurium. AMR testing showed that all isolates were resistant to more than one of the antibiotics (Table 1). All but two of the isolates (ID 26 and 30) were resistant to more than two of the antibiotics tested, with 96.6% (56 of 58) of the isolates being MDR. All isolates tested were susceptible to amikacin, cefoxitin, ceftriaxone, ciprofloxacin, gentamycin, nalidixic acid, and trimethoprim-sulfamethoxazole. Almost all of the isolates recovered from this study had a similar antimicrobial resistance pattern.

### Presence of integrons

Regardless of sampling points (1, 2, or 3), 29 were positive for class I integron (280 bp product) while only two of the

isolates showed a 233-bp PCR product by use of primers *int*L2, suggesting the presence of class 2 integron. Both of the two isolates also carried the class 1 integron.

### PFGE analysis

The PFGE analysis identified 9 distinguishable *Salmonella* genotypes. Of the 9 PFGE profiles, STC and ST accounted for 94.8% (55 of 58) and 5.2% (3 of 58) of the isolates, respectively (Fig. 1). Type IV, V, VII, VIII, and IX derived from cattle at two sampling periods showed 100% similarity. Type X (1 isolate from sampling 2), which is the most distant strain, showed only 73% similarity in PFGE banding patterns. Genotype V was the most prevalent (28/58, 48.3%) of the isolates, followed by types VI (15/58, 25.9%), IV and IX (both 3/58, 5.2%). Additionally, genotypes I, II, II, and X each represented 1.7% (1 of 58) of the genotypes (Fig. 1). Isolates 49 and 65, which were positive for both *Int* 1 and 2, belonged to genotypes I and IV,

respectively. The relationship between molecular types, integron carriage and resistance phenotypes of the *Salmonella* Typhimurium serovars Copenhagen is shown in Table 2.

## DISCUSSION

In this study, all but two of the *Salmonella* isolates were resistant to more than two of the antimicrobials tested, with 96.6% of the isolates showing multidrug resistance. The widespread AMR of *Salmonella* isolated from cattle in North Dakota has been reported before (23), with most animal strains showing more multidrug resistance than human *Salmonella* isolates show, possibly due to a difference in antimicrobial selection pressure exerted on the microorganisms in the two populations.

The emergence and dissemination of MDR among *Salmonella* isolates from healthy cattle have potential adverse implications to public health. Since the first description of class I integron by

**TABLE 2.** Relationship between molecular types, integron carriage and resistance phenotypes of the *Salmonella* Typhimurium serovar Copenhagen and *Salmonella* Typhimurium. **STC** = *Salmonella* Typhimurium serovar Copenhagen; **ST** = *Salmonella* Typhimurium

PFGE genotype	No. of isolates	Serovars	Int 1 No. (%)	Int 2 No. (%)	Resistance phenotypes
I	1	STC	1 (100)	-	Amox/Cla-Amp-Chl-Str-Sul-Tet
II	1	STC	1 (100)	-	Amox/Cla-Amp-Chl-Str-Sul-Tet
III	1	STC	1 (100)	-	Amox/Cla-Amp-Chl-Str-Sul-Tet
IV	4	STC	3 (75)	1 (33)	Amox/Cla-Amp-Chl-Str-Sul-Tet
V	26	STC	11 (42.3)	-	Amox/Cla-Amp-Chl-Str-Sul-Tet
V	1	STC	-	-	Susceptible
V	1	STC	-	-	Amp-Chl-Str-Sul-Tet
VI	14	STC	6 (42.9)	-	Amox/Cla-Amp-Chl-Str-Sul-Tet
VI	1	STC	-	-	Susceptible
VII	2	STC	2 (100)	-	Amox/Cla-Amp-Chl-Str-Sul-Tet
VIII	2	STC	2 (100)	1 (50)	Amox/Cla-Amp-Chl-Str-Sul-Tet
IX	4	STC	2 (50)	-	Amox/Cla-Amp-Chl-Str-Sul-Tet
<b>Total</b>	<b>58</b>	<b>29</b>	<b>(50)</b>	<b>2 (3.4)</b>	

Stokes and Hall (25), integron-mediated resistance has been reported in clinical isolates of various organisms, including *K. pneumoniae*, *K. oxytoca*, *Pseudomonas aeruginosa*, *E. coli*, *C. freundii* and *V. cholerae* (23, 24). It has been reported (5) that classes 1 and 2 are most common in resistant bacteria, and the mobility of these integrons was undoubtedly important in facilitating their spread into many different bacterial species.

In this study, although the prevalence of class 1 and 2 integrons were 50% (29/58) and 3.5% (2/58), respectively, more than 90% of the isolates were multidrug resistant. The commonest resistance phenotype was Amox/Cla-Amp-Chl-Str-Sul-Tet (94.8%, n = 55/58). The observed lower frequency of class 2 than class 1 integrons in this study cannot be fully explained, but reasons could vary from lower exposure to selective pressure of antibiotics among the isolates (31). Additionally, two isolates positive for class 1 integrons also had class 2 integrons. These isolates

belonged to genotypes I and IV (Table 1 and 2) and showed only about 67% genomic similarity (Fig. 1). They were recovered from different sampling points (points one and two, respectively).

It is important to note that all 29 isolates with class 1 integrons were susceptible to amikacin, cefoxitin, ceftriaxone, ciprofloxacin, gentamycin, kanamycin, nalidixic acid, and trimethoprim-sulfamethoxazole (not shown on table). Reasons for this are not known but could vary from lack of exposure to possibly presence of non-functional integrons, as reported in a previous study (15). Classes 1 and 2 integrons were not detected in 29 isolates (n = 29) and yet 93% (27/29) of these were MDR. Similarities in the drug resistance phenotypes between integron positive and negative isolates indicate that AMR may or may not be integron related. This observation is similar to what has been reported in a previous study in which class 1 integron was not always involved in the resistance of *E. coli* isolates to antimicrobial agents

(15). However, integrons have been often associated with broad antibiotic resistance, even if they do not encode multiple drug resistant determinants (30). This was also evident in our study, as not all integron bearing strains expressed resistance to antibiotics. Predominance of resistance phenotype Amox/Cla-Amp-Chl-Str-Sul-Tet across different PFGE profiles and integron carriage is strongly suggestive of influence of farm or microbial environment. Isolation of *S. Typhimurium* vars Copenhagen as the major *Salmonella* serovar (95% of the isolates) supports previous reports of the predominance of genotypes of some serotypes circulating among the steers. Clonality (both PFGE and antimicrobial resistance profiles) of *S. Typhimurium* vars Copenhagen was reported in a study that characterized *Salmonella* isolates from feedlot cattle (14), humans, and ready-to-eat-turkey produce (22). This strongly suggests the existence of well-established strains or similarities in antimicrobial usage in the farm environments. Therefore, sur-

veillance of AMR and their determinants in bacteria isolated from food animals and their products is critical to stem the risk they present to humans.

Variations in MDR profiles and integron carriage in *Salmonella* isolated from healthy feedlot steers in this study further support previous reports that MDR may or may not be integron related (17, 27). Additionally, different genotypes were observed to share similar antimicrobial resistance profiles, a strong suggestion of the influence of common environmental (farm) exposure. This phenomenon, which has been observed before by other studies (8), calls for inclusion of farm environments and their antimicrobial drug usage in future studies.

## CONCLUSION

This study highlighted the genotypic and phenotypic variations in *Salmonella* isolated in healthy feedlot steers. A common farm environment seemed to influence observed similarities in the resistance profiles of the different genotypes isolated. Although the AMR observed in the majority of *Salmonella* isolates was not matched with presence of integrons, an indication that AMR in *Salmonella* may be explained by determinants or mechanisms other than integrons warrants further research.

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## In Memory

*Stanley E. Gilliland*  
Stillwater, Oklahoma

We extend our deepest sympathy to the family of Dr. Stanley Gilliland who recently passed away. IAFP will always have sincere gratitude for his contribution to the Association and the profession. Dr. Gilliland had been a member of IAFP since 1999.

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# Don Schaffner Elected as Secretary



The International Association for Food Protection welcomes Dr. Donald W. Schaffner to the Executive Board as Secretary. Dr. Schaffner will take office at the conclusion of the Awards Banquet at IAFP 2010, in Anaheim, California. By accepting this position, Dr. Schaffner has made a five-year commitment to the Association and will begin his term as President in 2014.

Dr. Schaffner is Extension Specialist in Food Science and Professor at Rutgers University. He also serves as the Director of the Center for Advanced Food Technology. His research interests include quantitative microbial risk assessment and predictive food microbiology.

Dr. Schaffner has authored more than 100 peer-reviewed publications, book chapters and abstracts. He has been the recipient of more than \$5 million in grants and contracts, largely in the form of competitive national grants. Dr. Schaffner has educated thousands of Food Industry professionals through numerous short courses and workshops in the United States and more than a dozen countries around the world.

Dr. Schaffner was awarded the IAFP Elmer Marth Educator Award in 2009 for outstanding service to the public and IAFP in the area of food safety and food protection education. He also received the Sustained Research and Impact Award in 2008 from the Rutgers School of Environmental and Biological Sciences and NJ Agricultural Experiment Station in recognition of research and scholarship that has provided significant contributions to his profession, and contributions that have had direct measurable impact on the communities he serves.

Dr. Schaffner has served on a variety of national and international expert committees. He served on the U.S. National Academy of Sciences Standing Committee on Use of Public Health Data in FSIS Food Safety Programs and the Committee to Review the Use of Scientific Criteria and Performance Standards for Safe Food. He chaired two expert workshops on microbial risk assessment for the World Health Organization (WHO) and Food and Agriculture Organization (FAO) of the United Nations. Expert reports offering guidelines for Microbial Exposure Assessment and Risk Characterization arising from those two workshops were recently published by FAO/WHO. He also served on a number of Institute of Food Technologists (IFT) expert panels working on projects for FDA including: development and implementation of a risk-ranking framework to evaluate potential high threat microbiological agents, toxins, and chemicals in food; evaluation and definition of potentially hazardous foods; and quantification of the destruction kinetic of alternative processing technologies. Dr. Schaffner also served two terms on the US National Advisory Committee on Microbial Criteria for Foods (NACMCF), co-authoring documents on Parameters for Determining Inoculated Pack/Challenge Study Protocols and Consumer Guidelines for the Safe Cooking of Poultry Products.

Dr. Schaffner is active in several scientific associations including IAFP, IFT, Society for Risk Analysis (SRA), American Society for Microbiology (ASM), and Conference for Food Protection (CFP). Dr. Schaffner is an Editor for the *ASM Journal, Applied and Environmental Microbiology*, and serves on CFP, Council III - Science and Technology.

His recent service to IAFP includes membership on the *Journal of Food Protection* Editorial Board, IAFP Foundation Committee, Program Committee, Organizing Committee for IAFP's Second European Symposium on Food Safety, GMA Food Safety Award Jury and Nominating Committee. He currently serves as Vice Chairman for the IAFP Membership Committee.

Dr. Schaffner holds a B.S. in Food Science from Cornell University and a M.S. and Ph.D. in Food Science and Technology from the University of Georgia.





## *Fifth Dubai International Food Safety Conference*



**T**he Fifth Dubai International Food Safety Conference (DIFSC) took place over the dates of February 21 to 24 at the Dubai Convention and Exhibition Centre. Alongside of Gulfood Expo, DIFSC attracted more than 1,200 attendees from 53 countries with a large increased participation from researchers and university personnel. IAFP is proud to be involved in supporting this food safety

conference and it was nice to see so many IAFP Members participating by speaking or through poster presentations. It was truly in IAFP's spirit of sharing information on protecting the food supply with food safety professionals "worldwide".

DIFSC provides delegates with a good understanding of the current food safety issues, food safety management techniques and the best practices followed in the food industry. The Conference offers an excellent opportunity for industry professionals to meet with experts from around the world while acting as a platform to resolve food safety issues in the region. Direct interaction with presenters provides attendees and students the proper conditions to learn about food safety.

At the Opening Session, IAFP Executive Director David Tharp presented infor-





mation about how the Dubai Municipality and IAFP have worked together to further the food safety message in Dubai, the United Arab Emirates and the Gulf States region. Vickie Lewandowski, IAFP President, focused her plenary presentation on how IAFP's international activities have grown over the past five years. Both presentations provided IAFP great exposure to the many attendees. A good number of the audience members came forward afterwards to express interest in becoming actively involved with IAFP. Growth in Membership from countries in the region

can be seen as a direct result of IAFP's active participation with DIFSC.

We look forward to continuing work with DIFSC organizers from the Dubai Municipality for program development of future conferences. This cooperative effort provides an excellent occasion for IAFP to communicate directly with food safety professionals in the region while helping to identify leading food authorities for inclusion on the program. Our ongoing working arrangement with the Dubai International Food Safety Conference provides IAFP with opportunities we cannot achieve alone.



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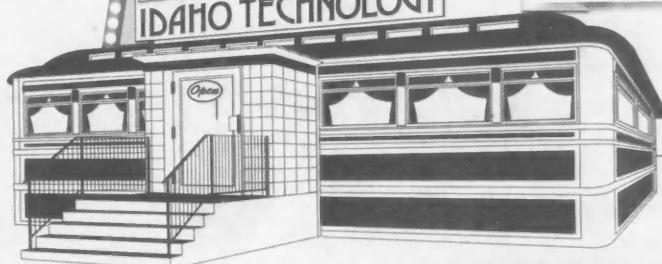
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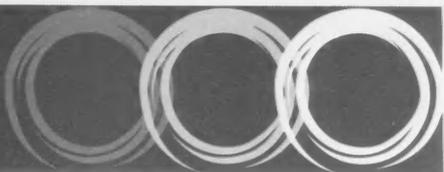
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# WHAT'S HAPPENING IN FOOD SAFETY



## 3-A SSI Announces New Information on 3-A Symbol Holders

**3**-A Sanitary Standards, Inc. (3-A SSI) announces new public information on current 3-A Symbol holders to assist regulatory sanitarians, processors, equipment fabricators, and other interested parties. Along with a list of authorized 3-A Symbol licensees for 2010, 3-A SSI posted the first licensee information on a new Probationary List.

"The public data on 3-A Symbol licensees is more valuable today than ever for inspection authorities, equipment fabricators and users," according to 3-A SSI Executive Director Tim Rugh. "Recognition and demand for the 3-A Symbol have grown in step with the need to know that equipment conforms to the appropriate 3-A Sanitary Standards, and the 3-A Symbol conveys this assurance," he said.

New this year, a Probationary List was recently added to disclose information on any licensee that is responsible for a finding of non-conformance, including the company name and the specific type and model of equipment. According to Tim Rugh, "The Probationary List is not intended to penalize the licensee, but to help inform all concerned parties that the licensee is addressing specific issues it has acknowledged require correction." The licensee remains in this status until a plan for corrective action is completed and verified by third party inspection.

The value of the 3-A Symbol in the marketplace was enhanced by the Third Party Verification (TPV) inspection requirement instituted in 2003 as a requirement for 3-A Symbol authorization. The TPV

requirement moved 3-A Symbol authorization away from an era of self-certification. Between 2003 and the end of 2007, approximately 520 TPV inspections were completed for equipment fabricated in the United States and 22 other countries around the world, according to 3-A SSI. The inspections must be renewed every five years to maintain a 3-A Symbol authorization, whenever equipment non-conformance is found, or if there is a significant change in materials or manufacturing processes.

Since 1956, the 3-A Symbol has been used to identify equipment that meets 3-A Sanitary Standards for design and fabrication. Voluntary use of the 3-A Symbol on dairy and food equipment assures processors that equipment meets sanitary standards, provides accepted criteria to equipment manufacturers for sanitary design, and establishes guidelines for uniform evaluation and compliance by sanitarians.

The public information on 3-A Symbol licensees is important public information because it shows all equipment that conforms to 3-A Sanitary Standards for dairy and food processing equipment and meets provisions of the 3-A Symbol program. Maintained on the 3-A SSI Web site at [http://www.3-a.org/symbol/holders\\_list.html](http://www.3-a.org/symbol/holders_list.html), the lists include current and discontinued licensees and the new Probationary List. The discontinued symbol holders list shows the reason for discontinuation, such as the equipment is no longer in production, the equipment was consolidated in another 3-A Symbol authorization resulting from a change in company ownership, or the failure of the holder to maintain the authorization in accordance with the terms and conditions for use of the 3-A Symbol.

## FDA Calls on Food Companies to Correct Labeling Violations; FDA Commissioner Issues an Open Letter to the Industry

**T**he U.S. Food and Drug Administration has notified 17 food manufacturers that the labeling for 22 of their food products violates the Federal Food, Drug, and Cosmetic Act.

The action follows an October 2009 statement by Commissioner of Food and Drugs Margaret Hamburg, M.D., encouraging companies to review their labeling to ensure that they were in compliance with FDA regulations, and were truthful and not misleading.

In an open letter to the industry dated March 3, 2010, Dr. Hamburg underscored the importance of providing nutrition information that consumers could rely on.

"Today, ready access to reliable information about the calorie and nutrient content of food is even more important, given the prevalence of obesity and diet-related diseases in the United States," Dr. Hamburg said in the letter. She also expressed her hope that the warning letters would clarify the FDA's expectations for food manufacturers as they review their current labeling.

The violations cited in the warning letters include unauthorized health claims, unauthorized nutrient content claims, and the unauthorized use of terms such as "healthy," and others that have strict, regulatory definitions.

Companies that received warning letters have 15 business days to inform the FDA of the steps they will take to correct their labeling.

Dr. Hamburg has made nutrition labeling a priority for the FDA. The warning letters are the agency's most recent action to help improve consumers' ability to make nutri-



tious choices. The FDA soon will propose guidance regarding calorie and nutrient labeling on the front of food packages and plans to work collaboratively with the food industry to design and implement innovative approaches to front-of-package labeling that can help consumers choose healthy diets.

### **Auburn's Food Science Program Moves to Department of Poultry Science**

In a strategic move to consolidate food safety efforts at Auburn University, a proposal is in process to transfer the university's food science program from the College of Human Sciences back into the College of Agriculture, its original academic home.

Pending required approvals, the food science program will become a formal part of the Department of Poultry Science. Three current food science faculty members will join the department, and the food science teaching program will become an option within the poultry science curriculum.

"Given that the Alabama poultry industry represents a modern global food industry, moving the food science program will allow the department and the College of Agriculture to better serve the poultry industry's needs," said Don Conner, head of the poultry science department.

"We will continue to have strong efforts devoted to live production, and adding strength in the food science discipline will uniquely position our department to truly address critical issues from the farm to the fork," he added.

Auburn University is developing a comprehensive Food Safety Initiative to address critical food safety issues facing our state and nation, and the Department of Poultry Science will play a key role in this university-wide initiative.

### **USDA and FDA Coordinating Efforts to Ensure Safety of Produce**

The US Department of Agriculture (USDA) and the Food and Drug Administration are working together to achieve the goals of enhancing the safety and quality of fresh produce in ways that take into account the wide diversity of farming operations. We are committed to leveraging the expertise of our partner agencies and working together to ensure that our current produce safety and quality activities are complementary and consistent. While USDA's Agricultural Marketing Service (AMS) is in the midst of evaluating a proposed marketing agreement for the leafy green industry, the FDA is currently developing a proposed produce safety regulation. It is our expectation that these products will take into account the diverse nature of farming operations and that any marketing agreement would conform to any regulations that may be promulgated by FDA.

The success of these efforts depends on the feedback and comments we receive from growers and other produce safety stakeholders. AMS will continue to review the comments that have been submitted to USDA on the proposed marketing agreement. To further inform its planned rulemaking, the FDA is announcing the establishment of a docket to receive information about current practices and conditions for the production and packing of fresh produce and practical approaches to improving produce safety. The FDA will work with AMS to have the testimony from the AMS hearings placed in the FDA docket for consideration by the FDA. The FDA encourages all interested persons to submit information they believe will inform the development of safety standards for fresh produce at the farm and packing house, as well as strategies and cooperative efforts to ensure compliance with those standards.

### **Enviro Tech Chemical Services Awarded FDA Food Contact Notification 944 for New Bromine-based Antimicrobial Developed for Meat and Poultry Industry**

Enviro Tech Chemical Services, Inc., a company in bromine chemistry, was awarded FDA Food Contact Notification (FCN) 944 for a newly developed bromine-based, liquid antimicrobial that the company will market as "HB2." FCN 944 allows for the use of HB2 in the meat and poultry industry, giving food processors a powerful preventive weapon in the battle against foodborne illnesses spread by outbreaks of *Listeria*, *Salmonella*, *E. coli* O157:H7, *Campylobacter*, and other bacterial and spoilage-causing microorganisms.

HB2's patent pending technology offers antimicrobial benefits comparable to chlorine-based products, but with significant advantages, including increased stability at the higher pH levels encountered in most food processing applications. While HB2 may be used in higher concentrations than chlorine, enhancing its efficacy, its toxicology profile is more benign than chlorine-based antimicrobials.

"In the field of bromine-based antimicrobials, HB2 is unsurpassed in terms of efficacy, cost effectiveness, ease of use, and worker safety," said Jonathan Howarth, Ph.D., Enviro Tech's vice president of technology.

Bromine-based antimicrobials have proven efficacious in combating pathogen-causing bacteria. As the regulatory environment and public scrutiny requires heightened vigilance in preventing outbreaks of foodborne illnesses, HB2 should help meat and poultry processors in their efforts to adhere to the highest standards for food safety.



### Dr. James Dickson Named NAMP Top Educator

The North American Meat Processors Association has honored Dr. James Dickson, a meat science professor at Iowa State University, with the Harry L. Rudnick Educator of the Year Award.

NAMP bestows the award annually on an industry leader who demonstrates a commitment to the highest standards in meat and/or food science education.

Dr. Dickson currently serves as a professor in ISU's Department of Animal Science, is professor in charge of the ISU component of the Food Safety Consortium and holds a courtesy appointment the University's Department of Food Science and Human Nutrition.

Dr. Dickson's research focuses on controlling bacteria in foods of animal origin to protect public health.

NAMP established the Rudnick award in 1969, named for the organization's first executive vice president who served as its attorney and EVP for 20 years until his retirement.

### Dr. Peter Snyder Jr. Receives the 2010 Foodservice Consultants Society International Trendsetter Award

Dr. Peter Snyder was awarded the 2010 FCSI Americas Trendsetter Award. The award is presented to an individual who best exemplifies innovation, creativity and unique and lasting contributions to the foodservice industry and is presented biannually.

Dr. Peter Snyder Jr., founder and president of Hospitality Institute of Technology & Management, was recognized for his lifetime commitment to food safety education. For over 50 years, Dr. Snyder has provided food technology and management education to the hospitality industry

and government personnel. After retiring from the U.S. Army as food service R&D coordinator at the rank of lieutenant colonel, he began helping food companies implement HACCP-based Total Quality Management programs. Dr. Snyder is known by colleagues as a professional who persistently sticks to science with a depth of knowledge relating to his craft and HACCP with its prerequisites that is unmatched.

### President Obama, Secretary Vilsack Announce Intent to Nominate Dr. Elisabeth Hagen as USDA Under Secretary for Food Safety

President Obama has announced his intent to nominate Dr. Elisabeth Hagen as the U.S. Department of Agriculture's Under Secretary for Food Safety. Hagen will serve with Agriculture Secretary Tom Vilsack.

"There is no more fundamental function of government than protecting consumers from harm, which is why food safety is one of USDA's top priorities," said Vilsack. "We can and must do a better job of ensuring the safety of meat and poultry products regulated by USDA, and Dr. Hagen brings the background, skills, and vision to lead USDA's efforts to make sure that Americans have access to a safe and healthy food supply."

The Food Safety mission of USDA includes the Food Safety and Inspection Service (FSIS), which is the public health agency in the U.S. Department of Agriculture responsible for ensuring that the nation's commercial supply of meat, poultry, and egg products is safe, wholesome, and correctly labeled and packaged. When the President announced the creation of the Food Safety Working Group last March, he said, "In recent years, we've seen a number of problems with the

food making its way to our kitchen tables... That is a hazard to public health. It is unacceptable." President Obama charged Secretary Vilsack and Health and Human Services (HHS) Secretary Kathleen Sebelius, the co-chairs of the Food Safety Working Group, with working to upgrade our food safety laws for the 21st century; foster coordination throughout government; and ensure that we enforce these laws to keep the American people safe. As part of this effort, Secretary Vilsack has instituted a top-to-bottom review of USDA's food safety regulations.

Dr. Elisabeth Hagen is currently the USDA's Chief Medical Officer, serving as an advisor to USDA mission areas on a wide range of human health issues. Prior to her current post, she was a senior executive at FSIS, where she played a key role in developing and executing the agency's scientific and public health agendas. She has been instrumental in building relationships and fostering coordination with food safety and public health partners at the federal, state, and local level.

Before joining the federal government in 2006, Hagen taught and practiced medicine in both the private and academic sectors, most recently in Washington, D.C. She holds an M.D. from Harvard Medical School, and a B.S. from Saint Joseph's University. Dr. Hagen completed her specialty medical training at the University of Texas Southwestern and the University of Pennsylvania, and is board certified in infectious disease. She is married and lives with her husband and two young children in northern Virginia.

### The Global Food Safety Initiative Announces New Board Chairman

The Global Food Safety Initiative (GFSI), managed by The Consumer Goods Forum, announced during the closing session of the Global Food Safety



Conference in Washington, D.C., the appointment of Jürgen Matern, vice president, Strategic Quality Management at Metro AG to succeed JP Suarez, Walmart as its Board Chairman. Matern took over the leadership of GFSI immediately.

Commenting on the appointment, outgoing Chairman JP Suarez said, "The GFSI Board is delighted that Jürgen has agreed to take over this role, which occurs at an important time for GFSI. The initiative has gained tremendous momentum over the last few years in many parts of the world. GFSI still has a key role to play in effectively managing the adoption of GFSI recognized schemes by building awareness among key stakeholders in the food industry to demonstrate the efficiencies associated with having a set of globally accepted food safety schemes."

Jürgen Matern added, "There are many more challenges ahead, and we look forward to building on our existing work in global markets and across the entire supply chain, to continuing to build relationships between the private and public sector, and to expanding awareness of GFSI and measuring its global impact."

Jürgen Matern will become the fifth Chairman of the Global Food Safety Initiative.

Having completed a Food Technology Engineering degree, Jürgen was responsible for Research and Development/Quality Assurance at Quaker Oats and Royal Canin in Germany from 1981 to 1989. In 1990, he joined Metro Germany to set up Quality Assurance for the food business in Germany. In the following years, he developed quality assurance in Metro to an international department with almost 500 engineers and specialists in 32 countries, covering the whole food and non-food business and assur-

ing fulfillment of legal and company requirements in the stores.

### Key Technology Appoints Teri Johnson to Inter-Continental Sales Manager

Key Technology announces the appointment of Teri Johnson to the new position of inter-continental sales manager for the Australia/New Zealand, Asia Pacific, and Latin American regions. Ms. Johnson is responsible for leading Key's sales and aftermarket activities in these areas to bring the company's automated inspection, specialized conveying, product preparation systems, and world-class service to the market.

"Key Technology has a long history of providing process automation systems to food processors and industrial customers. We need to constantly work to understand the changing dynamics of our diverse markets," said John Boutsikaris, senior vice president of global sales and aftermarket. "Teri is ideally suited to take the lead in this important arena. Given the depth of her experience with our products and the industries we serve, she is a terrific resource for our customers and a valuable asset to our team."

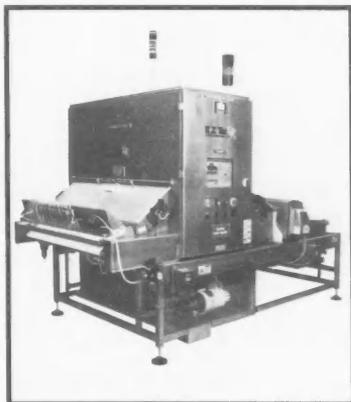
Ms. Johnson has been with Key for 25 years. Most recently, she was the Fresh-Cut Industry manager responsible for supporting Key's activities in this strategic industry around the world. Previously, she held a number of positions at Key including product marketing manager responsible for Key's Smart Shaker® vibratory conveyors, systems engineer, sales engineering manager, service manager, VP/GM Automated Inspection Systems, and sales and marketing support director. She holds a bachelor's degree in agricultural engineering from Oregon State University, and has completed the California Institute of Technology's Program for technology marketing.

### Strategic Diagnostics Inc. Becomes SDIX

Strategic Diagnostics Inc., a provider of biotechnology-based products and services for a broad range of life science, biotechnology, diagnostic, and food safety applications, has announced it will be doing business as SDIX (Strategic Diagnostics Inc. d/b/a SDIX).

The new SDIX name and logo are designed to better reflect the company's evolution from its historical beginnings as an industrial diagnostics products and antibody production company to the company it is today, a biotechnology company, with all of its core capabilities and expanded expertise in developing and delivering a full suite of innovative immuno-solutions. The new name also aligns the company name with its Web site address and NASDAQ listing, making the company easier to find and connect to. Commenting on the announcement, Mr. Fran DiNuzzo, president and CEO of SDIX said, "Over the last twenty years, Strategic Diagnostics Inc. has grown by delivering value and innovation to our customers. Over the past several years, the company has emerged as an innovative supplier of immuno-solutions to new customers in the Life Science market. As such, the company has evolved beyond its name and brand. Today, our company is much more than the original Strategic Diagnostics name or SDI logo represented. We are transforming SDI into a biotechnology company with a key focus on growth in the Life Science and Food Safety markets. We intend for SDIX and our updated logo to symbolize our commitment to be experts at creating advantage for our customers and partners using quality, innovative, and effective immuno-solutions."

# INDUSTRY PRODUCTS



Eriez

## Eriez® Introduces Extra Wide Combination Dual-Beam Multi-Zone X-Ray and Metal Detector System

Eriez® has introduced an extra wide combination E-Z Tec® Dual-Beam Multi-Zone X-Ray and Metal Detector System. This state-of-the-art device offers optimal detection and precise rejection of virtually any foreign object for packaged or bulk flow applications.

“Working together, the X-Ray will provide Eriez customers with unsurpassed foreign objects detection for ferrous, nonferrous, stainless steel and non-metals such as stone, glass, bone and some plastics. Additionally, the metal detector will provide for the best possible detection for aluminum—which is the most difficult metal for the X-Ray machine to detect,” explains Ray Spurgeon, Eriez product manager—Inspection Systems. “Now, processors can use both technologies to improve their food safety,” he says.

An additional benefit of the dual beam X-Ray System is it offers zone detection as packaged or raw product moves through the unit, according to Spurgeon. Rather than rejecting an entire row of product, the X-Ray unit will pinpoint a single product with a foreign object for precise rejection, thus allowing non-contaminated product to proceed. “This will save our customers thousands of dollars in re-work and labor,” says Spurgeon.

Moreover, Eriez X-Ray Systems operate using very low beam energy because of the company’s unique beam architecture. This design places Eriez’ X-Ray source very close to the belt/product and thus, the lowest energy. “Conversely, other manufacturers’ systems require more energy, as the x-ray sources need to be higher up from the belt/product. This can cause burn through of the foreign object,” says Spurgeon.

The dual beam technology also provides coverage for a conveyor belt more than 40 inches wide. Traditional X-Ray systems have accommodated belts up to 24 inches, according to Spurgeon. The sheer size of the dual beam coverage is unique to the industry as well as the use of individual zones with dedicated rejects for each.

The Eriez E-Z Tec DSP Metal Detector complements the dual beam X-Ray system by detecting ferrous, nonferrous, stainless steel and aluminum objects in package and raw product. The standard three-coil aperture arrangement sends a signal to the unit’s control for digital processing.

According to Spurgeon, the E-Z Tec X-Ray system and E-Z Tec DSP Metal Detector can be monitored and controlled remotely by using Eriez E-Z Link™ software.

Eriez  
888.300.ERIEZ (3743)  
Erie, PA  
www.eriez.com

## DuPont Qualicon Releases New BAX® System Test for *E. coli* O157:H7

Beef processors, service labs and other food industries can now use a new test from DuPont Qualicon to quickly and accurately check beef and produce for contamination with *E. coli* O157:H7. Developed in collaboration with the USDA Agricultural Research Service, this BAX® System assay uses real-time polymerase chain reaction (PCR) technology to quickly detect all known *E. coli* O157:H7, even atypical strains that can be missed by some other tests.

*E. coli* O157:H7 is a foodborne pathogen that can cause serious, sometimes fatal, illness at very low infectious doses—as few as 10 organisms. The BAX® System real-time assay was validated on industry standard sizes of ground beef, beef trim, lettuce and spinach that were spiked at 1–2 cells per portion, and it was found to perform as well or better than the reference culture methods.

According to Dr. Frank Burns, senior scientist at DuPont Qualicon, *E. coli* O157:H7 is a highly complex and variable organism that can be challenging to detect at low

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# INDUSTRY PRODUCTS

levels. "This new BAX® System assay is an extremely accurate and robust molecular method. Its rapid reaction time allows for quick test completion, which is essential for customers who hold perishable products while waiting for test results before shipping."

Food processing companies around the world rely on the BAX® system to detect pathogens or other organisms in raw ingredients, finished products and environmental samples. The automated system uses leading-edge technology, including polymerase chain reaction (PCR) assays, tableted reagents and optimized media to detect *Salmonella*, *Listeria* species, *Listeria monocytogenes*, *E. coli* O157:H7, *Enterobacter sakazakii*, *Campylobacter*, *Staphylococcus aureus*, *Vibrio*, and yeast and mold. With certifications and regulatory approvals in the Americas, Asia and Europe, the BAX® system is recognized globally as one of the most advanced pathogen testing system available to food companies. For more information on the new *E. coli* O157:H7 test, please visit [www.realtime-ecoli.com](http://www.realtime-ecoli.com).

**DuPont Qualicon**  
800.863.6842  
Wilmington, DE  
[www.dupont.com](http://www.dupont.com)

## Charm Sciences Introduces New Rapid One Step Assay for Streptomycin in Milk

Charm Sciences, Inc. announces the Charm® Streptomycin Test, a new Rapid One Step Assay (ROSA) for the detection of streptomycin in raw milk.

Charm Streptomycin Test uses patented ROSA technology—combining fast, accurate detection

with ease of use. It follows the same simple procedure and uses the same equipment as other ROSA lateral flow milk tests – add milk to the test strip, incubate and read on the ROSA Pearl Reader.

With a minimum detection level of 75 ppb, the Charm Streptomycin Test helps users meet regulatory requirements around the world: EU/ CODEX/Australian/New Zealand MRL (200 ppb), US Tolerance (0 ppb), Canadian MRL (125 ppb), and the new Russian Milk Federation import requirement of 500 ppb. Streptomycin is a member of the aminoglycoside family and can inhibit the growth of yogurt and cheese cultures.

Charm Streptomycin Test joins the Charm family of ROSA milk tests – the leading residue diagnostic tests employed by the dairy industry worldwide. Other ROSA milk tests include beta-lactam tests for the North American dairy market, MRL beta-lactam tests for international markets, as well as tests for tetracyclines, sulfa drugs, enrofloxacin, chloramphenicol, and aflatoxin M1. Combination beta-lactam/tetracycline kits are also available. All ROSA tests follow a similar test procedure and uses the same equipment, making testing efficient and cost effective. The ROSA Pearl Reader stores results electronically for record keeping and analysis.

**Charm Sciences, Inc.**  
978.687.9200  
Lawrence, MA  
[www.charm.com](http://www.charm.com)

## Biochrom Anthos 2010 Microplate Reader

When running routine microplate absorbance assays a robust, easy-to-use microplate reader is needed.

The Biochrom Anthos 2010 Microplate Reader is simply designed to meet researchers' needs for a quality instrument at a moderate price.

Four filters are supplied as standard that cover the wavelengths for most common absorbance assays with a colorimetric endpoint, e.g., ELISA, BCA, Bradford, and Lowry assays and additional filters are available.

A choice of software packages enables the user to connect to a PC and run both endpoint and kinetic assays with ease. Results can be printed directly or exported to a spreadsheet for further analysis.

**Biochrom Ltd.**  
+44 (0) 1223 427811  
Cambridge, United Kingdom  
[www.biochrom.co.uk](http://www.biochrom.co.uk)



Gainco

## Gainco Now Representing Fortress Technology in the Sale and Service of Metal Detectors to the U.S. Poultry Processing Industry

Gainco, Inc., introduces that it is now representing Fortress Technology in the sale of Fortress metal detection equipment to poultry and meat processors in the United States. The agreement between Gainco and Canadian-based Fortress Technology enables both

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# INDUSTRY PRODUCTS

companies to supply top-quality equipment and systems that represent the state-of-the-art in processing and data capture.

According to Joe Cowman, general manager of Gainco, Inc., the relationship with Fortress Technology was forged after a systematic review of metal detection equipment and systems produced by a variety of manufacturers. "As part of our evaluation, we commissioned an outside research firm to conduct a customer satisfaction survey with a cross-section of poultry and meat processors. More than a dozen metal detection equipment manufacturers were evaluated, and the results clearly showed that Fortress Technology is among the most highly rated in terms of the design quality and performance of its metal detectors in the harsh processing environment."

One of the most popular items being represented by Gainco is the Fortress Phantom metal detector. This highly rated model is equipped with the latest-generation digital equipment processing technology, and delivers the processing power needed to ensure superior detection accuracy, along with high-speed productivity and easy operability.

Fortress Phantom metal detectors are powered by a high-speed digital signal processor that gives these units the greatest processing power available in the market today. The equipment's special *UltraSense* capability enables the smallest metal contaminants to be detected at the highest sensitivity levels.

Moreover, Fortress Phantom metal detectors make life easy for production line operators. An "intuitive" interface means there

are no complicated menu systems or terminology to learn, while dedicated shortcut keys allow for instant activation of the most common functions. A multi-unit control capability allows for the operation and monitoring of numerous detector units – all from a single control panel.

The exceptional engineering of Fortress Phantom metal detectors provides other productivity-enhancing benefits, such as *AutoTest* automated system testing that reduces the inconsistencies associated with manual testing that so often lead to higher costs for poultry processors. In addition, an auto-balance feature enables the system to automatically adjust to changes in the production environment, thereby eliminating the need for manual balancing.

Fortress Phantom metal detectors are available in a choice of aperture sizes for integration with conveyor belt operations, or for standalone operation. Units are offered with an IP69k-certified, extra-rugged casing for complete waterproof protection as well as protection against harsh washdown chemicals and other daily rigors on the production floor.

Fortress Phantom metal detectors allow for PC-to-PC communication via special software designed to capture event logging, thereby making these units a critical control point in HACCP programs. Powered by an SQL database, the system can store an extensive volume of information for long periods of time, and on-demand reports can be generated easily and downloaded or exported in Excel® format. Flash RAM memory technology prevents any inadvertent loss of information.

In addition to representing Fortress Technology products, Gainco's field service technicians are factory-trained in the installation and servicing of the equipment.

**Gainco, Inc.**  
800.467.2828  
Atlanta, GA  
[www.gainco.com](http://www.gainco.com)

## **Hoefer, Inc. Has Introduced a Full Line of Single Channel Variable Volume Pipettes**

The new Hoefer Variable Volume Pipettes are designed for the demanding liquid handling applications found in research laboratories.

Six sizes are available from 0.5 µl for PCR protocols to 5 ml volumes for large sample dilutions.

The ergonomic design with low plunger force helps to reduce the risk of repetitive stress injuries. The Hoefer Variable Volume Pipettes have a tapered cone design which enables them to use pipette tips from a wide variety of manufacturers. The Hoefer Pipettes are fully autoclavable to eliminate cross contamination. All Hoefer pipettes come with a shelf bracket, calibration tool, and calibration certificate.

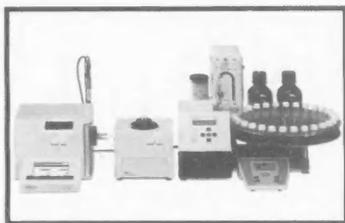
These Pipettes are available in six sizes including 0.5–10 µl, 2–20 µl, 10–100 µl, 20–200 µl, 100–1000 µl and 1–5 ml.

A large display window makes it easy to select the correct volume. Volume adjustment is made by turning the plunger button, eliminating the risk of accidental volume changes during pipetting.

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# INDUSTRY PRODUCTS



Mettler Toledo

## Mettler Toledo's New Era of Density and Refractive Index Meters for the Food and Beverage Industry

Mettler Toledo is delighted to announce the new LiquiPhysics™ Excellence instruments for density and refractive index determinations within the food and beverage industry.

The new LiquiPhysics™ Excellence density and refractometers are simple to operate and can be automated to determine pH and color simultaneously; making them the ideal tools for handling the high sample throughput requirements of the food and beverage industry.

The One Click™ user interface allows quick, simple and direct access to all routine tasks and provides clear user information utilizing shortcut buttons to start routine tasks immediately. Every operator has a personalized home screen, shortcuts and operation language. A unique product/method concept fulfills even the most demanding requirements without having to alter any settings. Measurement results are automatically converted into user-defined units such as Brix or alcohol concentrations, while sophisticated barcode functions conveniently input sample data and automatically ensure the right measurement method is always chosen.

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multiple parameters. Powerful sampling and automation units can completely automate measurement procedures and greatly reduce or even eliminate time-consuming cleaning procedures. A smooth and seamless LIMS/SAP integration with LabX™ PC software organizes comprehensive sample lists containing all the relevant data to entirely automate quality control.

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**Mettler Toledo**

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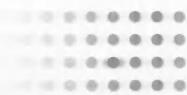
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# Preliminary Program

## SUNDAY, AUGUST 1

Opening Session – 6:00 p.m.

**Ivan Parkin Lecture** – Michael R. Taylor, Deputy Commissioner for Foods, U.S. Food and Drug Administration, Washington, D.C.

## MONDAY, AUGUST 2

Poster Session

- Antimicrobials
- Seafood
- Risk Assessment
- Novel Laboratory Methods
- Beverages and Water
- Sanitation
- Epidemiology
- Communication
- Outreach and Education
- Dairy and Other Food Commodities

Morning

Symposia

- Data Deluge, Interacting Players, and Complex Networks in Food Sciences
- Global Water Storages: Their Impact on Water Safety and Quality
- Microbiological Environmental Testing and Validation: Leading Edge Issues for Low-moisture Foods
- Human Pathogens Associated with Edible Plants
- Government, Academic, and Industry Collaborations to Advance the Development and Use of Microbiological Risk Assessments
- Converging Industry Initiatives on Traceability
- Ripple or Tsunami? Riding the Regulatory Wave to Safer Bottled Water and Water Beverages

Roundtable

- Research Needs a Roundtable: Retail and Foodservice Food Safety

Technical Session

- Applied Laboratory and Novel Laboratory Methods

Afternoon

Symposia

- Buy Local? Addressing the Safety Issues Behind Green Food Trends
- Less Recognized and Presumptive Pathogens: What Now, What Next?
- What's Been Keeping You Up at Night? – Selected Unanswered Food Safety Questions
- 'Ingredient' is a Ten-letter Word for Financial Disaster
- Good Agricultural Practices and the Small Scale Producer: What's Really Going on Out There?
- Flour Food Safety: The Changing Landscape – *E. coli* O157:H7

Technical Sessions

- Pathogens, Sanitation and Seafood
- Antimicrobials and Microbial Food Spoilage

## TUESDAY, AUGUST 3

Poster Session

- Applied Laboratory Methods
- Microbial Food Spoilage
- Non-microbial Food Safety
- General Microbiology
- Pathogens
- Food Toxicology

Morning

Symposia

- Risk-based Design of Thermally Processed Foods – A Look into the Future

- European Concept on Hygiene Monitoring in the Food Supply Chain – 'Farm-to-Fork' Concept in Practice
- National Institute of Food and Agriculture Showcase
- The *Salmonella* Smorgasbord: The Problem with Too Many Choices
- Food Packaging Technology: Opportunities and Challenges That Enhance Food Safety
- Non-O157:H7 *E. coli*: An Increasing International Concern
- Global Product Safety Harmonization: Exploring the Comparative Differences of International Policies

Technical Sessions

- Produce
- Meat and Poultry

Afternoon

Symposia

- Surveillance for Foodborne Disease: Challenging Phases
- Way before the Fork: Impact of Pre-harvest Management Programs and Supply Chain Influences on the Control of Shiga Toxin-producing *E. coli* Contamination in Beef
- Food and Food Environment Test Considerations in View of Changing Regulations
- Human Noroviruses: Attribution, Transmission, and Control
- Advances in Detection Technologies to Address Food Safety and Food Defense Needs

Technical Sessions

- Produce and Communication Outreach and Education
- Risk Assessment and Epidemiology

## WEDNESDAY, AUGUST 4

Poster Session

- Produce
- Meat and Poultry

Morning

Symposia

- Global Issues and Impact of Gluten Allergy and Celiac Disease
- Foodborne Disease Outbreak Update
- Food Safety in Developing Countries
- Setting the Science-based Agenda for Co-management of Watershed Quality and Produce Safety
- A Practical Approach to Risk Communication: Engaging Stakeholders and the Public
- Maintaining Consumer and Market Continuity during Animal Disease Outbreaks

Afternoon

Symposia

- Bacterial Toxins: A Past or an Emerging Issue for Food and Beverage Safety?
- WHO's Epidemiological Approach to Estimating Foodborne Diseases – WHO FERG
- Tools for Predictive Microbiology and Microbial Risk Assessment
- Issues in Production and Manufacture of Nuts and Nut-containing Products: Nuts to You
- Risk Benefit Analysis of Food Production and Consumption
- New Definitions in Imported Seafood Safety

4:00 p.m. — 4:45 p.m.

**John H. Silliker Lecture** – Robert L. Buchanan, Ph.D., Director and Professor, Center for Food Safety and Security Systems, University of Maryland, College Park, MD

# Ivan Parkin Lecture

MICHAEL R. TAYLOR

Deputy Commissioner for Foods  
U.S. Food and Drug Administration  
Washington, D.C.

At the Opening Session  
Sunday, August 1  
6:00 p.m. - 7:30 p.m.



Mr. Michael R. Taylor was named Deputy Commissioner for Foods at the U.S. Food and Drug Administration (FDA) in January 2010. He is the first individual to hold the position, which was created along with a new Office of Foods in August 2009. Mr. Taylor is leading FDA efforts to develop and carry out a prevention-based strategy for food safety; plan for new food safety legislation; and ensure that food labels contain clear and accurate information on nutrition.

Mr. Taylor joined the FDA in July 2009, as Senior Advisor to the Commissioner of Food and Drugs, with responsibility for overseeing the planning and implementation of food safety reform at FDA.

From June 2000 until joining FDA, Mr. Taylor worked in academic and research settings as a research professor at The George Washington University School of Public Health and Health Services, a professor at the University of Maryland's School of Medicine, and a senior fellow at Resources for the Future.

Mr. Taylor has served in government as Administrator of USDA's Food Safety and Inspection Service (1994–1996), Deputy Commissioner for Policy at the Food and Drug Administration (1991–1994), and FDA Staff Lawyer and Executive Assistant to the FDA Commissioner (1976–1981).

In the private sector, he established and led the food and drug law practice at King & Spalding (1981–1991 and November 1996–September 1998) and was Vice President for Public Policy at Monsanto Company (October 1998–January 2000).

Mr. Taylor has served on several National Academy of Sciences committees studying food-related issues. Until joining the FDA, he was a senior fellow with The Partnership to Cut Hunger and Poverty in Africa and a board member of Resolve, Inc. and the Alliance to End Hunger.

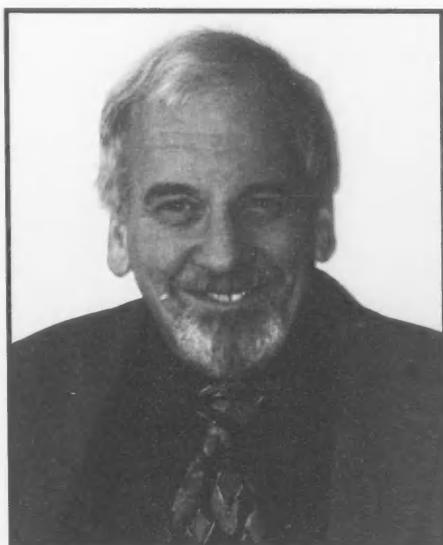
Mr. Taylor received his law degree from the University of Virginia and his B.A. in Political Science from Davidson College.

# John H. Silliker Lecture

ROBERT L. BUCHANAN, PH.D.

Director and Professor, Center for Food Safety and Security Systems  
College of Agriculture and Natural Resources  
University of Maryland  
College Park, Maryland

Wednesday, August 4  
4:00 p.m. - 4:45 p.m.



**D**r. Robert L. Buchanan received his B.S., M.S. M. Phil, and Ph.D. degrees in Food Science from Rutgers University, and post-doctoral training in Mycotoxicology at the University of Georgia. Since then, he has had over 30 years of experience teaching and conducting research in food safety, first in academia, then with the USDA Agricultural Research Service and the Food and Drug Administration.

Dr. Buchanan recently joined the faculty of the University of Maryland as Professor and Director of the new Center for Food Safety and Security Systems. His scientific interests are diverse and include extensive experience in predictive microbiology, quantitative microbial risk assessment, microbial physiology, mycotoxicology, and food safety systems. He has published over 400 manuscripts, book chapters, and abstracts on a wide range of subjects related to food safety, and has given hundreds of invited lectures on five continents.

Additionally, he is one of the co-developers of the widely used USDA Pathogen Modeling Program, and served on the boards of editors of several journals.

Dr. Buchanan holds an ongoing interest in the development of science-based public health policy. He served as the FDA Center for Food Safety and Applied Nutrition's Senior Science Advisor, as the Director of the CFSAN Office of Science, the FDA Lead Scientist for the U.S. Food Safety Initiative, and as Deputy Administrator for Science with the USDA Food Safety and Inspection Service.

Dr. Buchanan served on numerous national and international advisory bodies, including as the U.S. Delegate to the Codex Alimentarius Commission Committee on Food Hygiene and a permanent member of the International Commission on Microbiological Specification for Foods. Dr. Buchanan also served as a member of the National Academy of Science's Institute of Medicine Committee on Emerging Microbial Threats, the National Advisory Committee on Microbiological Criteria for Foods, and numerous international expert consultations for the FAO and WHO. Dr. Buchanan received numerous national and international honors and is a Fellow of both the American Academy for Microbiology and the Institute of Food Technologists.



# Activities

## SATURDAY, JULY 31

### COMMITTEE MEETINGS

2:30 p.m. - 5:00 p.m.

### WELCOME RECEPTION

5:00 p.m. - 6:30 p.m.

*Sponsored by Eurofins Scientific*

## SUNDAY, AUGUST 1

### COMMITTEE MEETINGS

7:00 a.m. - 5:30 p.m.

### STUDENT LUNCHEON (ticket required)

12:00 p.m. - 1:30 p.m.

### EDITORIAL BOARD RECEPTION (by invitation)

4:30 p.m. - 5:30 p.m.

### OPENING SESSION AND IVAN PARKIN LECTURE

6:00 p.m. - 7:30 p.m.

### CHEESE AND WINE RECEPTION

7:30 p.m. - 9:30 p.m.

*Sponsored by Kraft Foods, Inc.*

## MONDAY, AUGUST 2

### COMMITTEE AND PDG CHAIRPERSON

#### BREAKFAST (by invitation)

7:00 a.m. - 9:00 a.m.

### EXHIBIT HALL LUNCH

12:00 p.m. - 1:00 p.m.

*Sponsored by Johnson Diversey*

### EXHIBIT HALL RECEPTION

5:00 p.m. - 6:00 p.m.

*Sponsored by DuPont Qualicon*

## TUESDAY, AUGUST 3

### EXHIBIT HALL LUNCH

12:00 p.m. - 1:00 p.m.

*Sponsored by DNV*

### BUSINESS MEETING

12:15 p.m. - 1:00 p.m.

### EXHIBIT HALL RECEPTION

5:00 p.m. - 6:00 p.m.

*Sponsored by 3M Food Safety*

### PRESIDENT'S RECEPTION (by invitation)

6:00 p.m. - 7:00 p.m.

## WEDNESDAY, AUGUST 4

### JOHN H. SILLIKER LECTURE

4:00 p.m. - 4:45 p.m.

### AWARDS RECEPTION AND BANQUET

6:00 p.m. - 9:30 p.m.

### IAFP JOB FAIR

Sunday, August 1 through Wednesday, August 4

Employers, take advantage of the opportunity to recruit the top food scientists in the world! Post your job announcements and interview candidates.

### TOURS

IAFP has partnered with Southern California Gray Line to offer daily sightseeing tours to all major Southern California attractions. Specialty tours include LA/Hollywood and San Diego/Tijuana city tours, OC beaches, shopping excursions, movie stars' homes and Catalina Island. Book your tours now at [www.graylineanaheim.com](http://www.graylineanaheim.com) with your special IAFP discount coupon available under 'Special Promotions.' Or visit the IAFP Registration Desk once you arrive in Anaheim to arrange your tours.

## FOUNDATION GOLF TOURNAMENT

Saturday, July 31

Tustin Ranch Golf Club

6:30 a.m. - 2:00 p.m.

This championship 18-hole Ted Robinson designed course is unique to Orange County and extremely popular. Experience breathtaking scenery, sparkling lakes and cascading falls at this course. Voted the "Best Orange County Golf Course 2009" by the readers of the *Orange County Register* and 4-Star recipient of *Golf Digest Magazine's* "Places to Play".

*Your registration fee helps to support the IAFP Foundation.*





# General Information

## REGISTER ONLINE

Register online at [www.foodprotection.org](http://www.foodprotection.org).

## REGISTRATION

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

Full Registration includes:

- Program Book
- Welcome Reception
- Ivan Parkin Lecture
- Cheese and Wine Reception
- Technical Sessions
- Poster Presentations
- Symposia
- Roundtables
- Exhibit Hall Admittance
- Exhibit Hall Lunch (Mon. & Tues.)
- Exhibit Hall Reception (Mon. & Tues.)
- John H. Silliker Lecture
- Awards Banquet

## GUEST REGISTRATION

Guest registration includes:

- Welcome Reception
- Ivan Parkin Lecture
- Cheese and Wine Reception
- Exhibit Hall Admittance
- Exhibit Hall Lunch (Mon. & Tues.)
- Exhibit Hall Reception (Mon. & Tues.)

Please note that Guest registration applies to those individuals who are not employed in the food safety arena.

## PRESENTATION HOURS

<b>Sunday, Aug. 1</b>	
Opening Session	6:00 p.m. – 7:30 p.m.
<b>Monday, Aug. 2</b>	
Symposia & Technical Sessions	8:30 a.m. – 5:00 p.m.
<b>Tuesday, Aug. 3</b>	
Symposia & Technical Sessions	8:30 a.m. – 5:00 p.m.
<b>Wednesday, Aug. 4</b>	
Symposia & Technical Sessions	8:30 a.m. – 3:30 p.m.
Closing Session	4:00 p.m. – 4:45 p.m.

## FOUNDATION GOLF TOURNAMENT

<b>Saturday, July 31</b>	
Tustin Ranch Golf Club Benefiting the IAFP Foundation	6:30 a.m. – 2:00 p.m.

## EVENING EVENTS

<b>Sunday, Aug. 1</b>	
Opening Session	6:00 p.m. – 7:30 p.m.
Cheese and Wine Reception	7:30 p.m. – 9:30 p.m.
<i>Sponsored by Kraft Foods</i>	
<b>Monday, Aug. 2</b>	
Exhibit Hall Reception	5:00 p.m. – 6:00 p.m.
<i>Sponsored by DuPont Qualican</i>	
<b>Tuesday, Aug. 3</b>	
Exhibit Hall Reception	5:00 p.m. – 6:00 p.m.
<i>Sponsored by 3M Food Safety</i>	
<b>Wednesday, Aug. 4</b>	
Awards Banquet Reception	6:00 p.m. – 7:00 p.m.
Awards Banquet	7:00 p.m. – 9:30 p.m.

## SPECIAL EVENTS

NFPA Alumni and Friends Reception  
To be determined

## EXHIBIT HOURS

<b>Sunday, Aug. 1</b>	7:30 p.m. – 9:30 p.m.
<b>Monday, Aug. 2</b>	10:00 a.m. – 6:00 p.m.
<b>Tuesday, Aug. 3</b>	10:00 a.m. – 6:00 p.m.

## HOTEL INFORMATION

A special rate of \$149 per night is available at the Hilton Anaheim. Reservations can be made from the IAFP Web site. The Hilton Anaheim is adjacent to the Anaheim Convention Center where the sessions, exhibits and events will be held.

## CANCELLATION POLICY

Registration fees, less a \$50 administration fee and any applicable bank charges, will be refunded for written cancellations received by July 16, 2010. No refunds will be made after July 16, 2010 however, the registration may be transferred to a colleague with written notification. Refunds will be processed after August 9, 2010. Event and extra tickets purchased are nonrefundable.



International Association for  
Food Protection.  
6200 Aurora Avenue, Suite 200W  
Des Moines, IA 50322-2864, USA  
Phone: +1 800.369.6337 • +1 515.276.3344  
Fax: +1 515.276.8655  
E-mail: [info@foodprotection.org](mailto:info@foodprotection.org)  
Web site: [www.foodprotection.org](http://www.foodprotection.org)



# Exhibitors

Companies Scheduled to Exhibit as of April 5, 2010

Indicates IAFP Sustaining Members

3-A Sanitary Standards 703.790.0295	www.3-a.org
3M Food Safety 651.737.8286	www.3m.com/microbiology
A2LA-The American Association for Laboratory Accreditation 301.644.3248	www.a2la.org
Advanced Analytical Technologies Inc. 515.296.6600	www.aati-us.com
Advanced Instruments, Inc. 781.320.9000	www.aicompanies.com
AEMTEK 510.979.1979	www.aemtek.com
AES Chemunex 609.235.9272	www.aeschemunex.com
AIB International 785.537.4750	www.aibonline.org
Alchemy Systems 512.637.5100	www.alchemysystems.com
Alpha Biosciences, Inc. 410.467.9983	www.alphabiosciences.com
American Proficiency Institute 800.333.0958	www.api-pt.com
Applied Biosystems 650.638.5715	www.appliedbiosystems.com
ASI Food Safety Consultants 800.477.0778	www.asifood.com
ASM Press 800.546.2416	http://estore.asm.org/
ATCC 703.365.2700	www.atcc.org
BD Diagnostics 410.316.4000	www.bd.com/ds
Bio-Rad Laboratories 800.876.3425	www.bio-rad.com
BioControl 425.603.1123	www.biocontrolsys.com
BioLumix, Inc. 734.984.3100	www.mybiolumix.com
bioMérieux 314.731.8658	www.biomerieux-usa.com
Biotest Microbiology Corporation 973.625.1300	www.biotestusa.com
BSK Associates-Food and Dairy Laboratories 559.277.6960	www.bskassociates.com
Certified Laboratories 516.576.1400	www.800certlab.com
Charm Sciences 978.687.9200	www.charm.com
Chestnut Labs 417.829.3772	www.chestnutlabs.com
ClorDiSys Solutions, Inc. 908.236.4100	www.clordisys.com
Covance Laboratories, Inc. 608.395.3652	www.covance.com
CRC Press-Taylor & Francis Group LLC 561.998.2507	www.crcpress.com
Decagon Devices 509.332.2756	www.decagon.com
Deibel Laboratories 608.241.1177	www.deibelabs.com
DNV 281.396.1770	www.dnvcert.com
DuPont Qualicon 302.695.5244	www.qualicon.com
Ecolab Inc. 651.293.2233	www.ecolab.com
EMD Chemicals, Inc. 800.222.0342	www.emdchemicals.com
Eurofins Scientific 504.251.0098	www.eurofinsus.com
Exponent 888.656.3976	www.exponent.com
Fisher Scientific 412.490.8300	www.fishersci.com
Food Quality Magazine-A Wiley-Blackwell Publication 515.292.0140	www.wiley.com/go/food
Food Safety Magazine 818.842.2829	www.foodsafetymagazine.com
Food Safety Net Services 210.308.0675	www.food-safetynet.com
Gosselin 33.328.4193.03	www.plastiques-gosselin.fr
Hanna Instruments 401.765.7500	www.hannainst.com
Hardy Diagnostics 805.346.2766	www.hardydiagnostics.com
HiMedia Laboratories Pvt. Ltd. 91.22.40951919	www.himedialabs.com
Hygiena 805.388.8841	www.hygiena.net
Idaho Technology, Inc. 801.736.6354	www.idahotech.com
IEH Laboratories and Consulting Group 206.522.5432	www.iehinc.com
International Association for Food Protection 800.369.6337	www.foodprotection.org
International Association for Food Protection Student PDG 800.369.6337	www.foodprotection.org

International Food Hygiene 44.0.1377.241724	www.positiveaction.co.uk	Pall GeneSystems 33.299.055.790	www.pall.com/genedisc
Interscience Laboratories Inc. 781.792.2133	www.intersciencelab.com	Q Laboratories, Inc. 513.471.1300	www.qlaboratories.com
Log 5 Corporation 240.544.2050	www.log5.com	QMI-SAI Global 416.401.8700	www.qmi-saiglobal.com
Matrix MicroScience, Inc. 303.277.9613	www.matrixmsci.com	Quality Assurance & Food Safety Magazine 330.523.5400	www.qualityassurancemag.com
Medical Wire / ABSP 919.724.4010	www.mwe-usa.com	R&F Laboratories 630.969.5300	www.rf-labs.com
Michelson Laboratories, Inc. 562.928.0553	www.michelsonlab.com	Remel 913.895.4240	www.remel.com
Michigan State University Online Master of Science in Food Safety 517.884.2078	www.online.foodsafety.msu.edu	Rochester Midland Corporation, Food Safety Division 585.336.2200	www.rochestermidland.com
Microbial-Vac Systems 801.523.3962	www.m-vac.com	Romer Labs 636.583.8600	www.romerlabs.com
MicroBioLogics 320.253.1640	www.microbiologics.com	rtech laboratories 800.328.9687	www.rtechlabs.com
Microbiology International 301.662.6835	www.800ezmicro.com	Safe Quality Food Institute 202.220.0635	www.sqfi.com
MO BIO Laboratories 760.929.9911	www.mobio.com	SDIX 800.544.8881	www.sdix.com
MOCON Inc. 763.493.7231	www.mocon.com	SGS 973.575.5252	www.foodsafety.sgs.com
Nasco Whirl-Pak 800.558.9595	www.enasco.com/whirlpak	Siemens Industry Inc. 847.941.6470	www.usa.siemens.com/buildingtechnologies
The National Food Lab 925.551.4205	www.thenfl.com	Silliker, Inc. 708.957.7878	www.silliker.com
The National Institute for Hometown Security 606.451.3440	www.thenihs.org	Society for Applied Microbiology 44.0.1234.761752	www.sfam.org.uk
Nelson-Jameson Inc. 715.387.1151	www.nelsonjameson.com	Springer 212.460.1500	www.springer.com
Neogen Corporation 517.372.9200	www.neogen.com	Stericycle Expert RECALL 312.275.7588	www.expertrecall.com
Neutec Group, Inc. 516.870.0877	www.neutecgroup.com	University of Wisconsin-Madison Food Research Institute 608.263.7777	www.fri-wisc.edu
Northwest Analytical Inc. 503.224.7727	www.nwasoft.com	Vista Enterprises Incorporated 925.755.0511	www.vistaenterprisesinc.com
NSF International 734.827.7768	www.nsf.org	Weber Scientific 609.584.7677	www.weberscientific.com
Orkin Commercial Services 404.888.2794	www.orkincommercial.com	Wiley-Blackwell 515.292.0140	www.wiley.com/go/food

## EXHIBIT HOURS

**Sunday, August 1**  
7:30 p.m. - 9:30 p.m.

**Monday, August 2**  
10:00 a.m. - 6:00 p.m.

**Tuesday, August 3**  
10:00 a.m. - 6:00 p.m.

Hours subject to change.  
See final program  
for actual hours

## SPECIAL EXHIBIT HALL EVENTS

### CHEESE AND WINE RECEPTION

**Sunday, August 1** 7:30 p.m. - 9:30 p.m.  
*Sponsored by Kraft Foods*

### EXHIBIT HALL BREAKS

**Monday, August 2** 10:00 a.m. Pastries and Coffee  
*Sponsored by Deibel Laboratories*

3:00 p.m. Coffee Break  
*Sponsored by Idaho Technology, Inc.*

**Tuesday, August 3** 10:00 a.m. Pastries and Coffee  
*Sponsored by Springer*

3:00 p.m. Coffee Break  
*Sponsored by Covance*

### EXHIBIT HALL LUNCH

**Monday, August 2** 12:00 p.m. - 1:00 p.m.  
*Sponsored by JohnsonDiversey*

**Tuesday, August 3** 12:00 p.m. - 1:00 p.m.  
*Sponsored by DNV*

### EXHIBIT HALL RECEPTIONS

**Monday, August 2** 5:00 p.m. - 6:00 p.m.  
*Sponsored by DuPont Qualican*

**Tuesday, August 3** 5:00 p.m. - 6:00 p.m.  
*Sponsored by 3M Food Safety*



# Workshops

IAFP Workshops will be held at or depart from the Hilton Anaheim

<b>WORKSHOP 1</b> Characterization and Identification of Spoilage-causing Fungi: A Hands-on Workshop <b>Friday and Saturday</b> <b>July 30–July 31</b> <b>8:00 a.m. - 5:00 p.m.</b>	<b>WORKSHOP 2</b> Microbial Challenge Testing for Foods <b>Friday and Saturday</b> <b>July 30–July 31</b> <b>8:00 a.m. - 5:00 p.m.</b>
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**REGISTRATION** — (Payment must be received by July 16, 2010 to avoid late registration rates.)  
 Cancellations received by July 16 will be refunded, less a \$50.00 administrative fee. No refunds will be made after this date.

	<u>Early Rate</u>	<u>Late Rate</u>		<u>Early Rate</u>	<u>Late Rate</u>
Member	\$615.00	\$690.00	Member	\$480.00	\$555.00
Non-Member	\$715.00	\$790.00	Non-Member	\$580.00	\$655.00

*Student rates available, contact Julie at [jcattanach@foodprotection.org](mailto:jcattanach@foodprotection.org) for more information.*

## Workshop 1 – Characterization and Identification of Spoilage-causing Fungi: A Hands-on Workshop

Friday, July 30 and Saturday, July 31 • 8:00 a.m. – 5:00 p.m.

Laboratory Host:

Dr. Anuradha Prakah, Chapman University

Description:

The purpose of this workshop is to provide a hands-on experience and expertise in a live wet lab setting for isolation and identification of industrial significant yeast and mold. This workshop will lead to better understanding and rapid identification of fungal spoilage issues faced by the food industry. Mitigating the risks of yeasts and mold contamination remains a constant battle within certain segments of the food and beverage industry. Molds and yeasts cause significant food spoilage losses and mycotoxigenic molds pose significant food safety/regulatory hazards. Fungal identification is a scientific challenge requiring both art and technical expertise. There are a limited number of scientists who understand and have developed the art of fungal identification to a sound science. This workshop provides attendees a unique opportunity to interact first-hand with a group of experts, learning the best practices for isolating different fungi as well as the basics of classical identification methods. This workshop will also cover current molecular methods that are used to identify yeast and mold. Fifty percent of the workshop will involve live demonstration and a direct hands-on experience in a laboratory setting.

Note: Workshop participants will meet each day at the Hilton Anaheim and be transported to laboratory facilities at Chapman University.

Topics:

- Cultural Method Identification
- Method Demonstrations
- Case Studies

**Instructors:**

Frank Burns, DuPont Qualicon  
Shawn Johnson, Universal Sanitizers Inc.  
Dave Pincus, bioMérieux  
Emilia Rico, BCN Research Laboratories, Inc.

**Organizers:**

Julie Castro, Pepsico  
Jacquelyn Miles, Dr. Pepper Snapple Group  
Mangesh Palkar, Kraft Foods, Inc.

**Intended Audience:**

Microbiologists from Industry, Academia and Analytical Labs

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## **Workshop 2 – Microbial Challenge Testing for Foods**

**Friday, July 30 and Saturday, July 31 • 8:00 a.m. – 5:00 p.m.**

**Description:**

The food industry routinely uses challenge testing to determine whether a specific food requires time and temperature control for safety, or is suitably formulated. When laboratory testing is used to support a change in how the product is handled in a food establishment (e.g., refrigerated to unrefrigerated holding, extending shelf life, increasing ambient temperature storage or eliminating the need for date marking), the data are submitted to a state or local regulatory agency or directly to the FDA in the form of a variance application for approval. Food establishments or manufacturers submitting laboratory data to support their proposals must ensure the study is appropriate for the food and pathogen of concern and incorporate the necessary elements into the study to yield a valid design and conclusion. Because of the many questions raised by regulatory and industry professionals about the appropriate use of challenge studies, the National Advisory Committee on Microbiological Criteria for Foods (NACMCF) was asked to provide guidance on the topic of challenge studies and their use. This workshop will present the NACMCF report and instructors will guide the students through use of the material in the report to develop actual challenge study protocols based on NACMCF recommendations.

**Topics:**

- Overview of challenge study design (purpose of study, product description, product assessment, pathogens of concern, sampling intervals, test conditions, other controls, pass/fail criteria).
- Introduction to models and their use (examples of models, applicability of models to different foods, pathogen growth ranges used in modeling programs).
- Purpose of study, product description and assessment (purpose of the study, time/temperature control, lethality, formulation efficacy, product, ingredients, preparation, storage, pH and water activity).
- Pathogens of concern (selection criteria, ecology and epidemiology, use of models and the literature, inactivation study parameters).
- Sampling intervals and test conditions (growth vs. inactivation studies, strain selection, inoculation methods, packaging, sample size and replicates).
- Other controls and pass/fail criteria (surrogates, un-inoculated controls, pass/fail criteria selection and limitations of study).

**Instructors:**

Kathy Glass, University of Wisconsin-Madison  
Linda Harris, University of California-Davis  
Don Schaffner, Rutgers, The State University of New Jersey

**Organizer:**

Don Schaffner, Rutgers, The State University of New Jersey

**Intended Audience:**

Food industry professionals, testing lab personnel and regulators



# Contribute to the Silent Auction!

*Proceeds from the Silent Auction Benefit the IAFP Foundation*



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

- Hand Dipped Premium Chocolate Truffles
- Borden Glass Milk Bottles
- Georgia Gift Basket
- *The Texas Cowboy Kitchen* Cookbook
- Hand Painted Armadillo
- *Down Home with the Neelys* Cookbook
- Margaritaville Frozen Concoction Maker
- New York State Maple Syrup
- Ontario Ice Wine
- *Food Safety Culture* Book
- Tetley Tea Gift Set
- Cultured Pearl and Lemon Quartz Necklace
- Holstein Leather Jacket

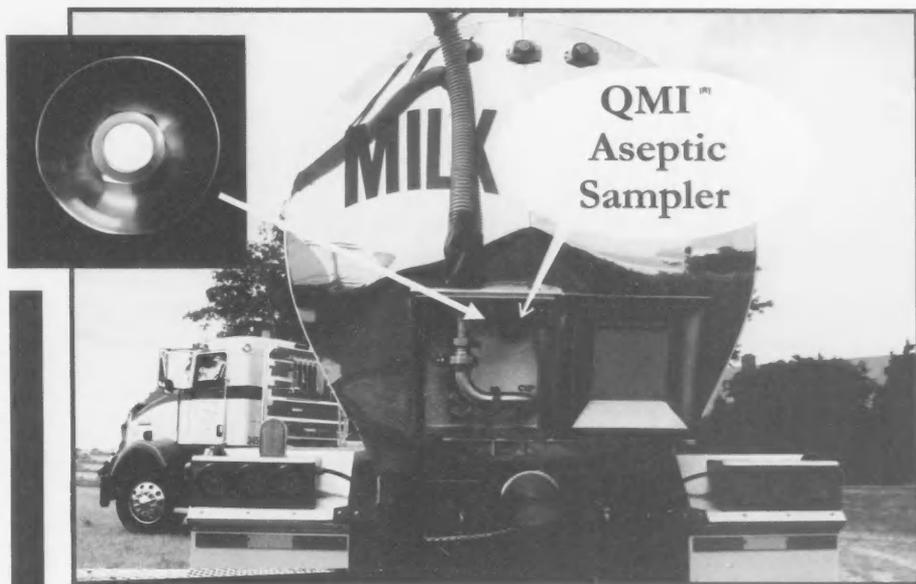
To donate an item go to our Web site at [www.foodprotection.org](http://www.foodprotection.org) and complete the Silent Auction Donation Form or contact Donna Gronstal at [dgronstal@foodprotection.org](mailto:dgronstal@foodprotection.org) +1 515.276.3344; +1 800.369.6337



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**Web Address: [www.qmisystems.com](http://www.qmisystems.com)**

# COMING EVENTS

## JUNE

- **6-9, NEHA Annual Educational Conference**, Albuquerque, NM. For more information, go to <http://www.neha.org>.
- **7-9, Texas Association for Food Protection Annual Meeting**, Omni Austin Hotel-Southpark, Austin, TX. For more information, call Fred Reimers at 210.658.9108.
- **8-10, 2nd International MoniQA Conference**, Krakow, Poland. For more information, go to <http://krakow.moniqa.org>.
- **8-11, 2nd International Symposium on Gluten-free Cereal Products and Beverages**, Tampere, Finland. For more information, go to <http://www.helsinki.fi/gf10>.
- **9-11, IAFP's Sixth European Symposium on Food Safety**, University College Dublin, Dublin, Ireland. For more information, go to [www.foodprotection.org](http://www.foodprotection.org).
- **11-18, Rapid Methods and Automation in Microbiology Workshop**, Kansas State University, Manhattan, KS. For more information, go to <http://www.dce.k-state.edu/conf/rapidmethods>.
- **14-15, Brazil Association for Food Protection Annual Meeting**, Conselho Regional de Quimica, São Paulo, SP, Brazil. For more information, E-mail Maria Teresa Destro at [mtdestro@usp.br](mailto:mtdestro@usp.br) or go to [www.abrappa.org.br](http://www.abrappa.org.br).
- **18-20, Food Processing Suppliers Association Annual Conference**, Chicago, IL. For more information, call 703.761.2600 or go to [www.fpsa.org](http://www.fpsa.org).
- **19-23, AFDO 114th Annual Educational Conference**, Sheraton Waterside Hotel, Norfolk, VA. For more information, contact Leigh Ann Stambaugh at 717.757.2888 or go to [www.afdo.org](http://www.afdo.org).
- **28-July 2, The Molecular Methods in Food Microbiol-**

**ogy Symposium and Workshop**, Fort Collins, CO. For more information, contact Kendra Nightingale at [Kendra.Nightingale@ColoState.edu](mailto:Kendra.Nightingale@ColoState.edu).

## JULY

- **5-8, Society for Applied Microbiology's Summer Conference**, Brighton, UK. For more information, call +44 (0)1234 761752 or go to [www.sfam.org.uk](http://www.sfam.org.uk).
- **14-16, NACCHO Annual Meeting**, Marriott Memphis Downtown, Memphis Cook Convention Center, Memphis, TN. For more information, go to [www.naccho.org](http://www.naccho.org).
- **17-21, IFT 2010 Annual Meeting and Food Expo**, McCormick Place, Chicago, IL. For more information, go to [www.am-fe.ift.org/cms/](http://www.am-fe.ift.org/cms/).
- **18-20, FPSA Process Expo - 2010**, McCormick Place, Chicago, IL. For more information, call 703.761.2600 or go [www.fpsa.org](http://www.fpsa.org).
- **30-31, IAFP Workshops**, Anaheim Convention Center, Anaheim, CA. For more information, go to [www.foodprotection.org](http://www.foodprotection.org).

## AUGUST

- **1-4, IAFP 2010 Annual Meeting**, Anaheim Convention Center, Anaheim, CA. For more information, go to [www.foodprotection.org](http://www.foodprotection.org).
- **18-19, 5th Innovative Foods Conference: Higher Valued Foods (FIESTA 2010)**, Melbourne, Australia. For more information, go to [www.innovativefoods2010.com](http://www.innovativefoods2010.com).
- **25-26, 2010 BioPro Expo**, Cobb Galleria Centre, Atlanta, GA. For more information call 800.332.8686 or go to [www.tappi.org](http://www.tappi.org).
- **30-Sept. 3, FoodMicro 2010**, Copenhagen, Denmark. For more information, go to [www.foodmicro.dk/](http://www.foodmicro.dk/).

## SEPTEMBER

- **13-15, 2010 International Dairy Show**, Dallas Convention Center, Dallas, TX. For more information, go to [www.dairyshow.com](http://www.dairyshow.com)
  - **21-23, New York State Association for Food Protection 87th Annual Meeting**, Syracuse, NY. For more information, contact Janene Lucia at 607.255.2892; E-mail: [jgg@cornell.edu](mailto:jgg@cornell.edu).
  - **21-24, IAFP's Latin American Symposium of Food Safety**, Bogota, Colombia. For more information, go to [www.acta.org.co/Congreso2010.php](http://www.acta.org.co/Congreso2010.php).
  - **22-23, Wisconsin Association for Food Protection Joint Education Conference**, Holiday Inn, Eau Claire, WI. For more information, go to [www.wafp-wi.org](http://www.wafp-wi.org).
  - **22-24, Kansas Environmental Health Association Fall Conference**, Great Wolf Lodge, Kansas City, KS. For more information, go to [www.e-keha.org](http://www.e-keha.org).
  - **22-24, Washington Association for Food Protection Annual Conference**, Campbell's Resort, Lake Chelan, WA. Contact Stephanie Olmsted at 206.660.4594 or go to [www.wafp.org](http://www.wafp.org).
  - **28-29, Arkansas Association for Food Protection Annual Meeting**, Tyson Foods, Springdale, AR. For more information, contact Mike Sostrin at 479.277.8641 or go to <http://arkafp.org>.
- ## OCTOBER
- **5-6, Iowa Association for Food Protection Annual Conference**, Quality Inn & Suites, Ames, IA. For more information, contact Lynn Melchert at 563.599.2394 or E-mail [lynn.melchert@swissvalley.com](mailto:lynn.melchert@swissvalley.com).
  - **13-14, Metropolitan Association for Food Protection Fall Seminar**, Douglass Student Center,

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# COMING EVENTS

Rutgers University, New Brunswick, NJ. For more information, contact Carol Schwar at [cshwar@co.warren.nj.us](mailto:cshwar@co.warren.nj.us) or go to [www.metrofoodprotection.org](http://www.metrofoodprotection.org).

- **17-20, UW-River Falls 30th Food Microbiology Symposium**, University of Wisconsin-River Falls, River Falls, WI. For more information, contact the Food Science Dept. at 715.425.3704 or go to

[www.uwrf.edu/afs-all/institutes/foodmicro](http://www.uwrf.edu/afs-all/institutes/foodmicro).

- **19-21, China International Food Safety and Quality Conference & Expo**, Longemont Hotel, Shanghai, P.R.C. For more information, go to [www.chinafoodsafety.com](http://www.chinafoodsafety.com).
- **26-28, North Dakota Environmental Health Association Annual Conference**, Bismarck, ND. For more information, go to [www.ndeha.org](http://www.ndeha.org).

- **31-Nov. 3, Pack Expo International**, McCormick Place, Chicago, IL. For more information, go to [www.packexpo.com](http://www.packexpo.com).

## NOVEMBER

- **17-20, UW-River Falls 30th Food Microbiology Symposium**, University of Wisconsin-River Falls, River Falls, WI. For more information, contact the Food Science Dept. at 715.425.3704.

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AUGUST 1-4, 2010  
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Milwaukee, Wisconsin

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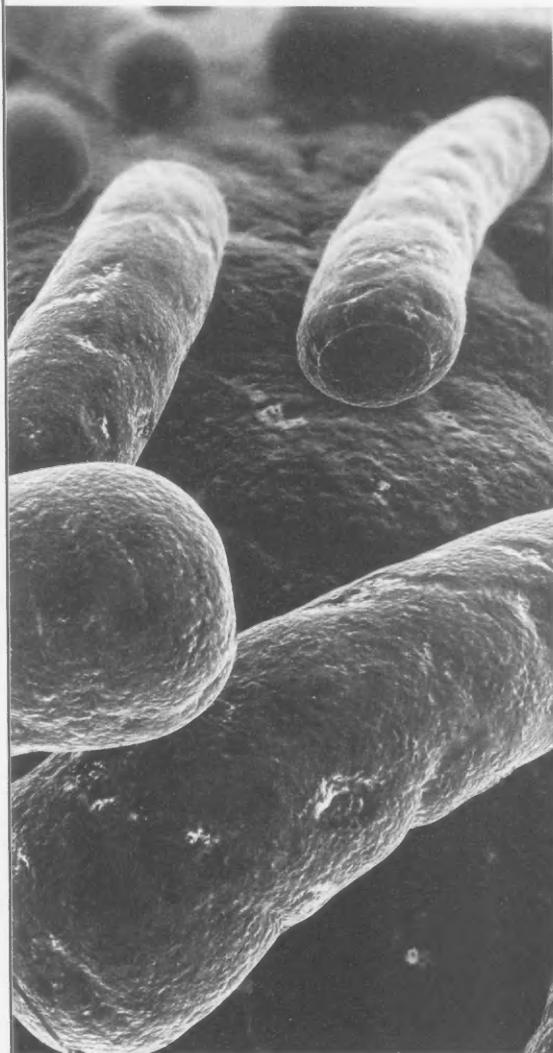
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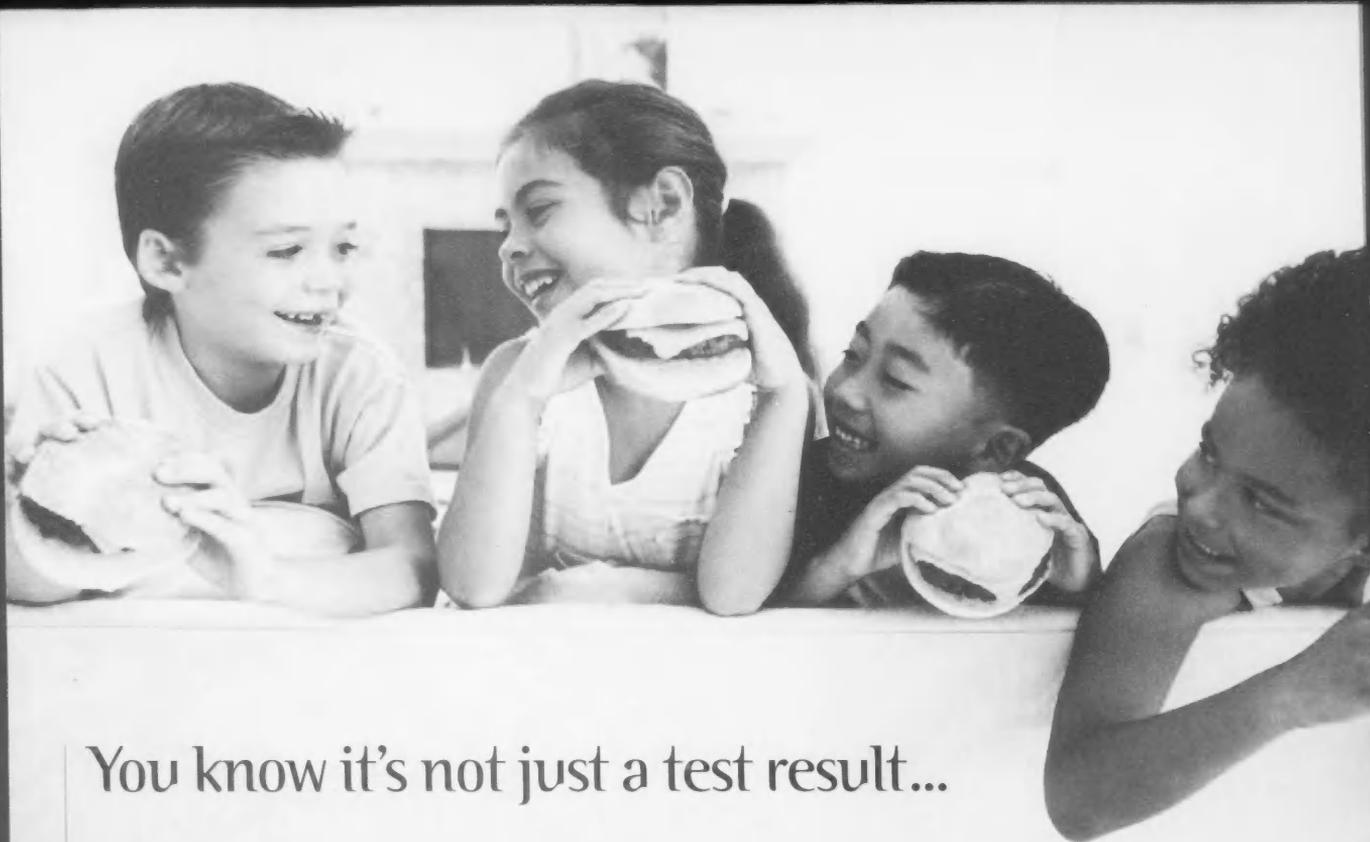
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