Observed Hand Washing Behaviors
Adoption of Interventions to Improve Food Safety at Meat and Poultry Processing Plants
WORLD TECHNOLOGY INGREDIENTS

WTI – A World Leader in Food Safety and Functional Food Ingredients

World Technology Ingredients Company, Inc. (WTI, Inc) is a specialty ingredients company founded in 1978 to provide ingredients and technology to the meat, poultry and seafood industries. Since 1988, World Technology Ingredients has been issued 12 patents in ingredient and food process technology.

WTI manufactures dry and liquid ingredients for use by food manufacturers to enhance finished product performance and inhibit a broad range of bacteria, yeast and molds. All ingredients manufactured and sold by World Technology Ingredients are approved for use in USDA and FDA regulated products. All WTI ingredients are Generally Recognized As Safe (GRAS), nonallergenic and safe for direct contact.

WTI opened its new state of the art production facility in Jefferson, Georgia in December 2005 with additional capacity to do Custom Blending and Contract Packaging. The facility, carefully designed to exceed all Good Manufacturing Practices (GMP’s) requirements received a SUPERIOR rating by the AIB on its very first inspection.

WTI is committed to providing safe, new and innovative technologies for its customers. Through leading edge research and technical initiatives, WTI is able to meet the needs of its customers, both large and small. Our goal is simple – to continuously identify and develop new ingredients/technology which provides our customers the tools to profitably succeed.

WTI Products Portfolio

The World Technology Ingredients products portfolio consists of six different brands of product, each designed to profitably enhance selected performance attributes of a wide variety of foods. The brands are: IONAL, Myosol, MOstatin, Tenderin, Marinal and Flavorin.

IONAL Products

The IONAL brands of antimicrobials consist of three basic product lines: IONAL, IONAL Plus and IONAL LC – all based upon blends of buffered citrates alone or in combination with diacetate or acetate. Since it’s approval as an antimicrobial for meats and poultry in 1995 extensive research has been conducted into the use of buffered citrates to inhibit the growth of microorganisms in/on raw and ready to eat meats and poultry.

IONAL

IONAL is straight buffered sodium or potassium citrate. As the name implies it increases ionic strength. In muscle protein systems this equates to increased marinating/brine retention and yield during processing with less moisture migration and purge in the finished package.

IONAL Plus

IONAL Plus products are buffered citrates with diacetate or acetate. They are used to increase the shelf life of perishable foods, especially raw marinated meats, fish and poultry. Typically incorporation of IONAL Plus into a food system will double the products shelf life.

IONAL LC

IONAL LC products are buffered citrates with diacetate or acetate which have been specifically formulated to inhibit the growth Listeria monocytogenes in/on foods, especially ready-to-eat meats (RTE). In RTE meats, IONAL LC has also been shown an effective means of preventing the outgrowth of Clostridium perfringens spores.

Myosol Products

Myosol brand phosphates are supersaturated tetrapotassium pyrophosphate solutions which are pH optimized to meet your specific needs. Myosol and Myosol Plus are performance enhanced functional ingredients designed to improve product/process yield and meat tenderness. They are readily soluble in cold water and instantaneously reactive in meat systems.

MOstatin Products

MOstatins are all natural, consumer friendly, clean label ingredients designed to inhibit the growth of microorganisms in/on food. MO for microorganism; statin for stasis or no growth. MOstatins have been successfully validated as an all natural CCP for Listeria for RTE meats, soups and salads.

MOstatin LV

MOstatin LV is an all natural blend of lemon juice concentrate and vinegar designed to enhance the organoleptic properties of foods while inhibiting a broad spectrum of bacteria, yeast and molds. MOstatin LV increases the water holding capacity of muscle protein systems. At low concentrations MOstatin LV does not have any flavor impact on the finished product. At higher concentrations it yields a slight vinegar taste and odor.

Flavorin Products

Flavorins are all natural flavor systems derived from fruit, vegetable and vinegar based ingredients designed to enhance the organoleptic attributes of food systems. They are available in both a dry and liquid form depending upon the desired functionality in the finished product.

Tenderin Products

Tenderins are all natural, consumer friendly, clean label alternatives to phosphates for use in muscle foods. Tenderins are derived from fruit juices and vegetable bi-products. They are species specific products – each formulated to accommodate the different functional characteristics encountered by different muscle foods: a.k.a. beef, chicken, pork, turkey or fish.

Tenderin DL

Tenderin DL is processed lemon juice concentrate dried onto a rice flour carrier designed to increase the cook yield of ready to eat meats and overall viscosity of food systems. The rice flour is a specialty blend formulated to deliver the optimum amylose and amylopectin concentrations. Its unique properties in cooked systems make Tenderins a viable alternative to phosphates.

Tenderin L

Tenderin L is the liquid form of Tenderins, each custom blended to meet the specific performance requirements of a wide range of food systems.

Marinal Products

Marinal brand marinades are customized systems designed to deliver performance at an affordable cost. They are specially formulated to maximize the interactions between substrate, process and packaging in order to achieve the customers’ desired performance objectives.
She doesn’t know how technology can make her food safer. But you do.

At DuPont Qualicon, we believe that science—particularly biotechnology—offers the potential to help ensure the safety and quality of our global food supply. Our innovative science can help you perform fast, accurate food quality testing to address a broad range of challenges—so you can get products to market faster and help ensure the safety of the foods people enjoy every day.

1-800-863-6842 Qualicon.com
Technology rules. Results matter.
ARTICLES

912 Observed Hand Washing Behaviors of Young Adults during Food Preparation
Jaclyn Maurer Abbot, Carol Byrd-Bredbenner, Virginia Wheatley, Ellen Cottone and Michele Clancy

917 Adoption of Interventions to Improve Food Safety at Meat and Poultry Processing Plants in the United States
Catherine L. Viator, Sheryl C. Cates, Shawn A. Karns and Mary K. Muth

ASSOCIATION NEWS

905 Sustaining Members
908 Perspectives from Your President
910 Commentary from the Executive Director
940 New Members

DEPARTMENTS

930 Affiliate Officers
942 What's Happening in Food Safety
945 Industry Products
949 Coming Events
956 Advertising Index

EXTRAS

928 Call for Awards – IAFP 2009
937 IAFP Committee, PDG, Task Force and Affiliate Council Mission Statements
950 Index to Volume 28
956 IAFP Financial Report
957 Journal of Food Protection Table of Contents
958 Audiovisual Library Order Form
959 Booklet Order Form
960 Membership Application

The publishers do not warrant, either expressly or by implication, the factual accuracy of the articles or descriptions herein, nor do they so warrant any views offered by the authors of said articles and descriptions.
Assurance GDS combines the latest innovations in microbiology and molecular science to bring you the most advanced DNA-based pathogen detection system. It offers unprecedented speed without sacrificing accuracy or convenience. In fact, multiple levels of specificity, including highly specific primers, probes and a patent pending sample concentration step, ensure unparalleled accuracy with fewer indeterminates or the need to interpret melt curves.

Learn how Assurance GDS can turn your testing challenges into solutions. Visit www.biocontrolsys.com or contact us at 1.800.245.0113 for more information.

Now available for Listeria spp., Listeria monocytogenes, Salmonella, E. coli O157:H7, and Shiga Toxin genes.
Now Available from QMI

A Faster, Safer &
More Accurate Way of
Sampling Your Tanker Truck

The QMI ASEPTIC SAMPLING SYSTEM
Is Now FDA & NCIMS Approved
for Tanker Truck Sampling

Quality Management, Inc.
(QMI)

426 Hayward Avenue North
Oakdale, Minnesota 55128
651-501-2337 (phone)
651-501-5797 (fax)

E-mail: info@qmisystems.com
Web Address: www.qmisystems.com
The mission of the Association is to provide food safety professionals worldwide with a forum to exchange information on protecting the food supply.
Is your organization in pursuit of “Advancing Food Safety Worldwide®”? As a Sustaining Member of the International Association for Food Protection, your organization can help to ensure the safety of the world’s food supply.

Sustaining Membership
Sustaining Membership provides organizations and corporations the opportunity to ally themselves with the International Association for Food Protection in pursuit of "Advancing Food Safety Worldwide®." This partnership entitles companies to become Members of the leading food safety organization in the world while supporting various educational programs through the IAFP Foundation that might not otherwise be possible.

Organizations who lead the way in new technology and development join IAFP as Sustaining Members. Sustaining Members receive all the benefits of IAFP Membership, plus:

- Monthly listing of your organization in Food Protection Trends and Journal of Food Protection
- Discount on advertising
- Exhibit space discount at the Annual Meeting
- Organization name listed on the Association's Web site
- Link to your organization's Web site from the Association's Web site
- Alliance with the International Association for Food Protection

**Gold Sustaining Membership $5,000**
- Designation of three individuals from within the organization to receive Memberships with full benefits
- $750 exhibit booth discount at the IAFP Annual Meeting
- $2,000 dedicated to speaker support for educational sessions at the Annual Meeting
- Company profile printed annually in Food Protection Trends

**Silver Sustaining Membership $2,500**
- Designation of two individuals from within the organization to receive Memberships with full benefits
- $500 exhibit booth discount at the IAFP Annual Meeting
- $1,000 dedicated to speaker support for educational sessions at the Annual Meeting

**Sustaining Membership $750**
- Designation of an individual from within the organization to receive a Membership with full benefits
- $300 exhibit booth discount at the IAFP Annual Meeting
Sustaining Membership provides organizations the opportunity to ally themselves with IAFP in pursuit of Advancing Food Safety Worldwide. This partnership entitles companies to become Members of the leading food safety organization in the world while supporting various educational programs that might not otherwise be possible.

| GOLD | 3M Microbiology Products | St. Paul, MN | www.3m.com |
|      | DuPont Qualicon          | Wilmington, DE | www.dupont.com |
|      | Applied Biosystems       | Foster City, CA | www.appliedbiosystems.com |
|      | BD Diagnostics           | Sparks, MD | www.bd.com |
|      | JohnsonDiversey          | Sharonville, OH | www.johnsondiversey.com |
|      | bioMérieux, Inc.         | Hazelwood, MO | www.biomerieux.com |
|      | Kellogg's                | Battle Creek, MI | www.kellogg.com |
|      | Bio-Rad Laboratories     | Hercules, CA | www.biorad.com |
|      | Kraft Foods              | Glenview, IL | www.kraftfoods.com |
|      | BPI Technology, Inc.     | Dakota Dunes, SD | www.beproducts.com |
|      | PepsiCo                  | Chicago, IL | www.pepsico.com |
|      | Cargill                  | Minneapolis, MN | www.cargill.com |
|      | SGS North America        | Fairfield, NJ | www.us.sgs.com |
|      | The Coca-Cola Company    | Atlanta, GA | www.thecoca-colacompany.com |
|      | Silliker Inc.            | Homewood, IL | www.silliker.com |
|      | ConAgra Foods, Inc.      | Omaha, NE | www.conagrafoods.com |

(Continued on next page)
<table>
<thead>
<tr>
<th>SUSTAINING MEMBERS</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>SUSTAINING</strong></td>
</tr>
</tbody>
</table>

| Food Directorate, Health Canada, Ottawa, Ontario, Canada; www.hc-sc.gc.ca |
| FoodHandler Inc., Mesa, AZ; www.foodhandler.com |
| Food Lion, LLC, Salisbury, NC; www.foodlion.com |
| GOJO Industries, Akron, OH; www.gojo.com |
| HiMedia Laboratories Pvt. Limited, Mumbai, Maharashtra, India; www.himedialabs.com |
| IBA, Inc., Millbury, MA; 508.865.6911 |
| Idaho Technology, Inc., Salt Lake City, UT; www.idahotech.com |
| Institute for Environmental Health, Lake Forest Park, WA; www.iehinc.com |
| Iowa State University Food Microbiology Group, Ames, IA; www.iastate.edu |
| Jimmy Buffett's Margaritaville, Orlando, FL; www.margaritaville.com |
| Kim Laboratories, Inc., Champaign, IL; www.kimlaboratories.com |
| The Kroger Co., Cincinnati, OH; www.kroger.com |
| Lester Schwab Katz & Dwyer, LLP, Short Hills, NJ; www.lskdnylaw.com |
| Malt-O-Meal Company, Northfield, MN; www.malt-o-meal.com |
| Michelson Laboratories, Inc., Commerce, CA; www.michelsonlab.com |
| Michigan State University-ProMS in Food Safety, East Lansing, MI; www.msu.edu |
| Micro-Smedt, Herentals, Belgium; www.micro-smc.be |
| Microbial-Vac Systems, Inc., Bluffdale, UT; www.m-vac.com |
| Mol Industries, Grand Rapids, MI; www.molindustries.com |
| Nasco International, Inc., Fort Atkinson, WI; www.nasco.com |
| The National Food Laboratory, Inc., Dublin, CA; www.therlf.com |
| Nelson-Jameson, Inc., Marshfield, WI; www.nelsonjameson.com |
| Neogen Corporation, Lansing, MI; www.neogen.com |
| Nestlé USA, Inc., Dublin, OH; www.nestle.com |
| NSF International, Ann Arbor, MI; www.nsf.com |
| Oxoid Canada, Nepean, Ontario, Canada; www.oxoid.com |
| Penn State University, University Park, PA; www.psu.edu |
| Process Tek, Des Plaines, IL; www.process tek.com |
| The Procter & Gamble Co., Cincinnati, OH; www.procterandgamble.com |
| Publix Super Markets, Inc., Lakeland, FL; www.publix.com |
| Q Laboratories, Inc., Cincinnati, OH; www.qlaboratories.com |
| R&F Laboratories, Downers Grove, IL; www.rf-labs.com |
| Randolph Associates, Birmingham, AL; www.randolph.com |
| REMEL, Inc., Lenexa, KS; www.remel.com |
| rtech” laboratories, St. Paul, MN; www.rtechlabs.com |
| Rochester Midland Corporation, Rochester, NY; www.rochestermidland.com |
| Seiberling Associates, Inc., Dublin, OH; www.seiberling.com |
| Siemens Building Technologies, Inc., Buffalo Grove, IL; www.building-technologies.usa.siemens.com |
| The Steritech Group, Inc., San Diego, CA; www.steritech.com |
| Strategic Diagnostics Inc., Newark, DE; www.sdix.com |
| Texas Agricultural Experiment Station, College Station, TX; www.tamu.edu |
| United Fresh Produce Association, Washington, D.C.; www.unitedfresh.org |
| Wal-Mart Stores, Inc., Bentonville, AR; www.walmart.com |
| Walt Disney World Company, Lake Buena Vista, FL; www.disney.com |
| Wegmans Food Markets, Inc., Rochester, NY; www.wegmans.com |
| WTI, Inc., Jefferson, GA; www.wtiinc.com |
| Zep Manufacturing Company, Atlanta, GA; www.zep.com |
Leadership, the ability to lead by providing effective guidance and direction, is an attribute that is always needed and often missing. Leadership is not a single trait or action. It is the process by which a person influences an organization or group of people to efficiently and effectively accomplish an objective or goal. These extraordinary times we are in present real challenges and opportunities for our global food safety leaders.

As I write this month’s column, the Presidential election for the United States is only one week away. This election is occurring at a time of unprecedented economic turmoil in the United States and around the world. There are many reasons for this economic crisis. Poor judgment (we probably could say greed) on the part of big banks and Wall Street led to the explosion of sub-prime loans and the housing bubble. The results of these actions include a frozen credit market and a loss of confidence in both the financial industry and the government’s ability to regulate and monitor this industry.

From my perspective, it is clear that poor leadership contributed to the situation we are now in today. It is unreasonable to think that most ordinary citizens would have an understanding of the complex national and international money markets or the broad implications of borrowing more for a home than they can ultimately afford to pay back. There has been an almost total void of effective leadership on these issues in both the public and private sector.

You might ask what does this have to do with food safety? Now, more than ever, leadership is critical for food safety. No one sector can fully assure that foods will be completely free of bacterial pathogens at all times. Particularly at this time of financial instability, we need leadership at all levels. Food producing companies have an implicit (and legal) requirement to produce foods that are safe. Regulatory and Public Health Agencies have a statutory requirement to assure the safety of foods. Finally, consumers must be educated to handle foods safely.

Effective leaders will not only acknowledge the importance of food safety, but they will also recognize that there is a cost associated with assuring the safety of foods and will resist the temptation to cut food safety programs in these difficult financial times. It is likely that the current financial condition of the United States and many countries around the world will pose even more challenges to our ability to fully fund food safety programs in both the private and public sectors. As budget deficits grow, many countries will face pressure to reduce funding for regulatory and public health agencies likely hindering their ability to monitor the safety of our foods.

Food producing companies are facing unprecedented challenges. Companies are pressured to keep food cost low because reduced consumer spending on foods as a result of high unemployment and high inflation. At the same time, rising grain prices and increased energy costs are putting upward pressures on food prices. All of these challenges in a time when we have seen numerous outbreaks of bacterial associated foodborne illnesses around the world.

How will we be able to reconcile these opposite pressures of reducing food costs without compromising the safety of foods? The answer is leadership. First, leaders, whether in government or private industry, must acknowledge that there can be no wavering on the issue of food safety, and they must accept that there is a cost for food safety. Leaders must demand at all times that everyone involved in the production and regulation of foods – from the president of the company...
- to the line worker — to the farmer
in the field — to the congressman
allocating fund for FDA, USDA, or
CDC— must never forget that what
they are doing may effect the safety
of foods. From my perspective,
every time any of these individuals
makes a decision, they should
ask themselves if they would feel
comfortable with their child eating
the food they are producing or
regulating!

Former IAFP President, Frank
Yiannas has often talked about the
concept of a “culture of food safety.”
I believe that Frank is absolutely
correct, and this “culture of food
safety” has to start at the top. From
a government perspective, the
government leaders, whether
federal, state, or local, must ade-
quately fund regulatory and public
health agencies and demand
accountability from everyone
involved from the head of agencies,
to inspectors, to research scientists.
In food production, everyone from
the president of the company
producing the food to the deli clerk
in the grocery store must under-
stand the importance of their role
in producing safe foods and recog-
nize that they can never “take a day
off” when it comes to food safety.
Leaders must acknowledge that the
cost of food safety is not optional,
but it is a cost of doing business.
Leaders must never waiver and
demand nothing less than the best
at all times.

In closing, this past week we lost
a true leader, pioneer, and visionary
if the field of food microbiology,
Dr. James Jay. Many of you know
Dr. Jay because one of his food
microbiology books was your first
exposure to food microbiology.
But, for those of us who have had
the honor and pleasure of knowing
Dr. Jay on a personal level, he
was much more than his books. Dr.
Jay was a man of incredible intel-
lence and a true gentleman. Dr. Jay,
you will be missed, and the world is a
much better place because of you.

Please join us in Grapevine,
Texas for the IAFP Annual Meeting
on July 12–15, 2009. I welcome your
comments or feedback. Please email
me at stan.bailey@na.biomerieux.
com.

Make Your Vote Count!

Elect the next IAFP Secretary online.
Watch your inbox for voting instructions
on January 31st.
It is hard to believe, but here we are at December and the end of another year! The conclusion of a year provides a good opportunity to look back and to look ahead, so we will do both in this month’s column. To look back, we will review IAFP’s accomplishments and our financial outcome. Then to look forward, we’ll report on plans for 2009.

Let’s begin with the look back. During 2008, IAFP organized and held four conferences (or symposia) around the world. They ranged between the much focused, “Prepared, but Not Ready-to-Eat Foods” symposium in January (held in the Washington, D.C. area) to the Latin America Symposium on Food Safety covering a broad section of subject matter (held in Campinas, SP, Brazil). In November this year, we held our Fourth European Symposium on Food Safety in Lisbon, Portugal looking into the issues of “Advancements in Food Safety.” Since I am writing prior to the start of this Symposium, we cannot report details, but all indications point to a record attendance and standing room only for the facility we will use.

The fourth conference, of course, was our Annual Meeting! We had a very successful meeting this year in Columbus, Ohio with more than 1,840 attendees. The conference was our second best in terms of adding net revenue to the General Fund. Other accomplishments include working with organizers in Beijing, China and Dubai, United Arab Emirates on conferences held in those locations. Although these were not technically “IAFP” conferences, they both provided an excellent opportunity for IAFP to become more recognized in those regions.

In addition to our conference activities, we also expanded our Membership by 11% over the last two years. We have seen a 50% increase in international Membership while Canada and Mexico (combined) and the US have increased by 18% and 4% respectively. This is surely an indication that IAFP is providing the information needed by food safety professionals worldwide!

Members can now access the Journal of Food Protection Online, 24 hours a day, anywhere in the world.

A new service provided to Members is that Food Protection Trends is available for online access. As with JFP Online, this journal is now available online to Members around the globe for instant access any time of the day! There is no need to wait for the postal service to deliver IAFP journals when you purchase online access!

As for our financial report, let’s just say it could have been better. IAFP’s year ends on August 31, so the financial activity report is shown on page 956 of this issue. You will see that the change in our General Fund balance declined by almost $92,000. This loss for fiscal year end (FYE) August 31, 2008 can be directly linked to the loss we incurred on our investment accounts. We budgeted for $40,000 to come from investments when in reality; we lost $73,000 for a difference of $113,000 in net results. There were a number of other factors, both positive and negative, that influenced the final results; but the end result is still the same—a loss of $92,000.

As disturbing as this is, it is not catastrophic for IAFP. If you have followed my reports over the past years, you will notice that as an organization, we have focused on building the General Fund balance so that we can sustain losses such as the one incurred this year. We still have a substantial dollar amount in the General Fund ($668,000) and that allows us to be very strong financially.
We surely don’t like the position we found ourselves in this year, but it is one we can continue to work to overcome. I’m sure you know, FYE 2009 has not started off very well on the investment side either, but we are making adjustments to soften the effects that investment losses could have on our financial results. One thing to put it in perspective is that the monies IAFP has invested are all long-term investments of more than 10-years in length. Therefore, we have time to allow the markets to recover without needing to pull the monies from these investments.

Now let’s look at the future. In the coming year, you can expect to see IAFP continue to organize pertinent food safety conferences around the world. We will continue our involvement with the China International Food Safety and Quality Conference (CIFSQ) along with the Dubai International Food Safety Conference (DIFSC). Plans for the IAFP European Symposium (Germany, October 2009) and our International Symposium (Korea, November 2009) are progressing. All of these plans advance while we work feverishly on IAFP 2009 being held this year in Grapevine, Texas (Dallas-Fort Worth area).

IAFP will continue to monitor opportunities that warrant a “Rapid Response” or a “Timely Topics” symposium format. There could be topics that we can bring food safety professionals together whereby government, industry and academia can discuss historical perspective, current knowledge and future plans to solve food safety issues. We stand ready to provide this type of forum.

During this coming year, we expect to charter additional new Affiliate organizations from both North America and outside of North America. A number of groups have expressed interest! We will move forward on establishing an “IAFP Press” where books on food science and food safety will be published. The IAFP Report will continue to strengthen in its ability to communicate food safety information to professionals around the globe. Food Protection Trends will become more accessible as an online publication.

Another exciting change for IAFP will be the remake of our Web site. We expect this to evolve during the first quarter of 2009 and this will put additional resources at the fingertips of all IAFP Members. The Web site will be easier to use, more eye-appealing and allow users to find IAFP information much quicker.

Each of these areas of emphasis is being concentrated upon to provide additional value for your Membership. They are also designed to continue to attract new Members so that our Membership base continues to grow.

As this month’s column concludes, I want to thank each and every IAFP Member for your support of IAFP and more importantly, for the efforts you put forth to make the food supply safe for all consumers. You are protecting the public’s health and what can be more important than continuing this effort? Without our health, we truly have nothing.

Best wishes from IAFP for a happy holiday season and for a healthy and prosperous New Year!

---

CALL FOR TECHNICAL AND POSTER ABSTRACTS

IAFP 2009
July 12–15, 2009
Gaylord Texan Resort
Grapevine, Texas

Call for Abstract Instructions and Submission Form
at www.foodprotection.org


Questions regarding abstract submission can be directed to: Tamara Ford, Phone: 800.369.6337; 515.276.3344; E-mail: tford@foodprotection.org, or go to www.foodprotection.org.
Observed Hand Washing Behaviors of Young Adults during Food Preparation

JACLYN MAURER ABBOT,* CAROL BYRD-BREDBENNER, VIRGINIA WHEATLEY, ELLEN COTTONE and MICHELE CLANCY
Dept. of Nutritional Sciences, Rutgers University, The State University of New Jersey, New Brunswick, NJ 08901, USA

SUMMARY
Identifying populations in which hand washing behaviors are less than optimal is a vital first step in improving the focus of food safety education efforts. The purpose of this study was to observe the hand washing behaviors of young adults (n = 153, age 18–26 years) while they prepared two dishes in a controlled kitchen laboratory. Trained researchers observed participants, who were blinded to the study purpose. Subsequent to the observations, participants completed a survey designed to assess their hand washing knowledge and self-reported hand washing behaviors. Young adults reported that they performed half of all recommended hand washing behaviors; yet they were observed performing only 25 percent of recommended practices. Young adults washed their hands more frequently prior to starting food preparation and after handling raw poultry and least frequently after handling unwashed fresh produce and after occasions when contamination was likely to occur (e.g., answering cell phone). Although overall mean hand washing knowledge was high (72% correctly answered questions), only 37 percent knew the most hygienic way to wash hands. These findings indicate that young adults could benefit from food safety education interventions designed to expand knowledge and increase actual practice of recommended hand washing techniques.

INTRODUCTION
Hand washing has long been recognized as an important health behavior that can reduce the risk and spread of illness (23). Poor hand hygiene in those preparing food can both introduce and spread foodborne disease. Few fully appreciate the control they can exert in their own kitchens to reduce their risk of foodborne disease (19) or recognize that food mishandling, including inadequate hand washing during food preparation, likely causes a significant amount of foodborne disease (1, 4, 6, 19, 25).

Young adults (ages 18 to 29) and individuals with education beyond high school are more likely than others to engage in risky food handling (2, 14, 15, 18, 26). This, along with reduced opportunities to learn about safe food handling (including hand washing) in school, suggests that the current population of young adults may unknowingly pass along their risky food handling behaviors and increase the risk for foodborne disease not only to themselves, but also to those for whom many may eventually assume responsibility (e.g., aging parents, children). Further, the most common jobs held by youth are in the food service industry, ranging from cashier to table buser to server to cook (12), putting them in direct and indirect control of the food safety of meals being served to dining patrons.

*A peer-reviewed article
*Author for correspondence: 732.406.9355; Fax: 706.659.4520
Email: abbot@aesop.rutgers.edu

912 FOOD PROTECTION TRENDS | DECEMBER 2008
TABLE 1. Hand washing observation checklist: percent of young adults* observed engaging in each practice

<table>
<thead>
<tr>
<th>Hand washing occasion</th>
<th>% Observed</th>
<th>% Observed</th>
<th>% Observed</th>
<th>% Observed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Before Food Preparation Began</td>
<td>60</td>
<td>60</td>
<td>54</td>
<td>16</td>
</tr>
<tr>
<td>After Handling Raw Produce</td>
<td>14</td>
<td>14</td>
<td>7</td>
<td>0</td>
</tr>
<tr>
<td>After Handling Raw Poultry</td>
<td>63</td>
<td>63</td>
<td>41</td>
<td>10</td>
</tr>
<tr>
<td>As Necessaryb</td>
<td>4</td>
<td>5</td>
<td>4</td>
<td>1</td>
</tr>
</tbody>
</table>

*n = 153

bAs necessary = hands were washed following: each absence from the food preparation work station (e.g., bathroom breaks, telephone call); touching body parts (e.g., wiping hands on clothes, touching face, hair); coughing/sneezing or blowing nose

Evaluating the extent of risky food handling behavior, in particular hand washing during food preparation, is vital to understanding how to tailor and focus food safety education to this population. One purpose of this study, therefore, was to observe young adults’ hand washing behaviors during food preparation and compare their compliance to established guidelines for the prevention and spread of foodborne disease (22). Additional purposes were to determine how observed hand washing behaviors compared to self-reported behaviors as well as to assess young adults’ knowledge of recommended hand washing procedures.

METHODS

Young adults enrolled at a major US university were recruited via official university student email listservs and campus newspaper advertisements. Interested participants completed a brief screening questionnaire to identify those meeting eligibility requirements [i.e., age 18 to 26 years, did not hold a sanitation certification, had good or excellent health, and were not at increased risk of foodborne disease (i.e., pregnant, immune compromised)]. Of the 167 eligible individuals accepting the invitation, 153 honored their scheduled appointment time.

These participants, blinded to the study purpose, followed two simple recipes that involved handling a raw food of animal origin that was to be cooked and one raw vegetable ingredient that was to be chopped and served uncooked. Trained observers recorded participant’s hand washing practices, using a 16-point criterion-based checklist. Specifically, the trained observers observed whether participants washed their hands on these four occasions: (a) before beginning food preparation, (b) after handling unwashed produce, (c) after handling raw poultry, and (d) as necessary (e.g., after touching hair, taking a break to answer the phone, use the restroom). For each occasion on which the participant was observed washing his or her hands, one point was earned, up to a maximum of four points. An additional point was awarded for each of the four hand washing occasions when participants washed their hands with running water, used soap, and/or rubbed their hands for at least 20 seconds (see Table 1) (24). Thus, if a participant washed his or her hands before beginning food preparation, using running water and soap, and rubbed the hands for at least 20 seconds, four points were earned. Ten percent (n = 16) of the observations were randomly selected for independent observation by two researchers; a comparison of the observations indicated a 92% inter-rater reliability. The food preparation protocol, observation checklist validation procedures, and observer training methods have been described previously (7).

Following food preparation, young adults completed a 10-item hand washing knowledge test (e.g., most hygienic way to wash hands, when hands should be washed) [Livingston Reliability = 0.83 (5, 11, 20)] and 4-item self-report hand washing practices questionnaire (e.g., when during food preparation participant reports washing hands, whether soap is used) that were part of a comprehensive food safety survey (9, 10, 21). Using standard procedures, experts developed, validated, pilot-tested, and refined these instruments [published previously (7—9)]. Participants earned 1 point for every correct knowledge response and recommended self-reported practice. Thus, scores could range from 0 to 10 and 0 to 4 for the knowledge and self-reported practices questionnaires, respectively. Analysis of variance was conducted using the statistical analysis software program StatView, version 5 (SAS Institute, 2002) to compare observed and self-reported hand washing practices. This study was approved by the authors’ Institutional Review Board. All study participants signed informed consent forms prior to participation.

RESULTS

Participants had a mean age of 20.73 ± 1.30 (standard deviation, SD) with a range of 18 to 26 years and were from a wide array of college majors. The majority (99%) prepared at least one meal weekly and were female (56%), white (67%), and upperclassmen (85%). Most did not believe that they or a house-
TABLE 2. Selected self-reported handwashing behaviors and knowledge

<table>
<thead>
<tr>
<th>Self-Reported Handwashing Behaviors</th>
<th>Participant Answer (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Right after handling raw meat, raw chicken or raw fish, what do you usually do?</td>
<td></td>
</tr>
<tr>
<td>- Continue cooking</td>
<td>3</td>
</tr>
<tr>
<td>- Rinse my hands with water</td>
<td>27</td>
</tr>
<tr>
<td>- Wipe my hands on a paper/dish towel</td>
<td>2</td>
</tr>
<tr>
<td>- Wash my hands with soap*</td>
<td>63</td>
</tr>
<tr>
<td>- I never handle raw meat or chicken</td>
<td>5</td>
</tr>
<tr>
<td>2. Before you begin preparing food, how often do you wash your hands with soap?</td>
<td></td>
</tr>
<tr>
<td>- All of the time*</td>
<td>39</td>
</tr>
<tr>
<td>- Most of the time</td>
<td>37</td>
</tr>
<tr>
<td>- Some of the time</td>
<td>17</td>
</tr>
<tr>
<td>- Rarely</td>
<td>7</td>
</tr>
</tbody>
</table>

**Handwashing Knowledge**

Which is the most hygienic way to wash your hands?

1. Apply sanitizer, run water, rub hands together for 20 seconds, rinse hands, dry hands, rub on an antiseptic hand lotion

2. Apply soap, rub together for 20 seconds, rinse hands under water, dry hands, apply sanitizer

3. Run water, moisten hands, apply soap, rub hands together for 20 seconds, rinse hands, dry hands*

4. Run water, moisten hands, apply sanitizer, rub hands together for 20 seconds, rinse hands, dry hands, rub on antiseptic hand lotion

*Best practice
*Correct answer

Hold member had food poisoning in the past year (85%) and had never held a job serving (60%) or preparing (79%) food. More than 90 percent had never completed a university course in nutrition, food science, or microbiology. Most (97%) rated their food safety knowledge and skills as at least fair.

A majority (60%) were observed washing their hands before beginning food preparation with at least water, slightly over half (54%) used soap, and only 16 percent rubbed their hands together for the recommended 20 seconds (Table 1). During food preparation, close to 60 percent did not wash their hands with soap and water after touching raw poultry and before continuing with food preparation activities (including touching produce that was to be served raw). In this sample of young adults, hand washing compliance was best prior to the start of food preparation, followed by after handling raw poultry, after handling unwashed produce, and lastly at other times during food preparation when hand washing is necessary. Females scored significantly higher than males on the hand washing compliance scale ($P = 0.03$) and were more likely than males to wash their hands with soap after handling raw poultry (45% vs. 35%).

The majority (76%) reported hand washing with soap before preparing food all or most of the time, which is significantly ($P < 0.0001$) higher than the 54 percent observed doing this (Table 2). Sixty-three percent reported usually hand washing with soap after handling raw poultry, whereas only 41 percent were observed doing so ($P < 0.0001$). Although mean hand washing knowledge was high at 72 percent ($7.2 \pm 2.0$), only 36 percent knew the most hygienic way to wash hands, and at most only 16 percent were observed actually engaging in this practice at any time during food preparation ($P < 0.0001$). Overall, participants were observed performing only 25 percent of recommended hand washing practices (mean = 4.1 ± 2.7; range 0 to 12), yet they reported that they performed half of the recommended practices (mean = 2.0 ± 1.3; range 0 to 4).

**DISCUSSION**

The findings of this study indicate that young adults fail to follow recommendations for hand washing before and during food handling. Further, young adults report better hand washing behavior than is actually observed.
equate hand washing practices like those observed in this study have been observed worldwide. Videotapes of food handling practices in 40 Australian households revealed that nearly half of those observed did not wash their hands with soap nor did they wash their hands at all after handling raw meat (17). Among adults in the United Kingdom, 58 percent did not wash their hands after handling raw meat or poultry (27). Videotaped observation of primary food preparers in American households revealed that one-fifth did not wash their hands after handling raw meat or poultry and that time spent washing hands was significantly less than recommended (3).

Poor hand hygiene extends beyond failure to wash after handling raw foods of animal origin. An observational study of secondary level school children found that only 58 percent of females and 48 percent of males washed their hands after using the bathroom (16). Perhaps more shocking, a recent news report indicated that only 65 percent of physicians at a major medical center in the United States complied with hand hygiene guidelines (13).

The findings of this cross-sectional study must be considered in light of its limitations. The sample was limited to a small number of self-selected young adults. Also, the direct observation of participants may have encouraged hand washing. Nonetheless, the observed inadequate hand hygiene before and during food preparation and the discrepancy between reported and observed behaviors highlights the need to improve both knowledge and practice of recommended hand washing techniques in young adults.

When developing informational messages that teach young adults about food safety and hand washing, health professionals should focus efforts on the hand washing problem areas identified by this study. First, young adults report better hand washing behaviors than they are observed practicing. This discrepancy should be addressed, since young adults may falsely believe they are engaging in safe food handling practices (i.e., washing their hands more frequently) when in fact they overestimate their practice of hygienic behaviors and are actually at increased risk for contaminating food during food preparation. Second, young adults fail to engage in appropriate hand washing at all suitable times during food preparation. Third, young adults do not follow the recommended hand washing guidelines of using soap and rubbing their hands together for 20 seconds under running water. Fourth, it appears that young adults may be aware that they should wash their hands before beginning food preparation and after handling raw poultry, but they are unaware of the importance of hand washing after handling unwashed produce and following common behaviors (e.g., answering a cell phone, touching the face) that occur frequently during food preparation. Hand washing education efforts focused on specific problem areas have the potential to reduce the foodborne disease risk of this population.

ACKNOWLEDGMENTS

This research was funded by the US Department of Agriculture, National Food Safety Initiative, Grant No. 2003–51110–01736.

REFERENCES


Adoption of Interventions to Improve Food Safety at Meat and Poultry Processing Plants in the United States

CATHERINE L. VIATOR, SHERYL C. CATES, SHAWN A. KARNS and MARY K. MUTH
RTI International, 3040 Cornwallis Road, Research Triangle Park, NC 27709, USA

SUMMARY
To learn how meat and poultry processors promote food safety, we conducted a nationally representative mail survey of processing plants (944 completed surveys, 66% response rate). Plants employ a variety of sanitation and other food safety practices to control Salmonella, E. coli, Listeria and other pathogens. Most plants sanitize hand tools during operations (89%) and treat drains with sanitizers for pathogen control (84%). About 64% of plants have purchase specifications to control pathogens in raw meat and poultry. However, less than one-third of plants apply antimicrobial chemicals. Seventy-one percent of plants conduct voluntary microbiological testing, and 70% conduct environmental sampling. Analysis by HACCP size suggests that large and small plants are more likely than very small plants to use many types of food safety practices and technologies ($P < 0.01$). Furthermore, plants that produce ready-to-eat products or inputs to further processing are more likely than plants with no such production to use some types of food safety practices and technologies. The findings can be used to establish a baseline of current industry practices, to conduct analyses of plant practices that might contribute to risk-based inspection initiatives, and to conduct required economic analyzes of proposed regulations.

INTRODUCTION
Meat and poultry processors debone, fabricate, grind, or further process (for example, cook, cure, or smoke) meat and poultry products. These processors must address problems of foodborne pathogens on meat and poultry products, both incoming and during processing and packaging. Three foodborne pathogens that are of primary concern to meat and poultry processors are E. coli, Salmonella, and Listeria monocytogenes. Although some consider the United States food supply to be one of the safest in the world, millions of Americans contract foodborne illness each year (8). For example, more than 40 Americans became ill and 21 were hospitalized after consuming ground beef contaminated with E. coli O157:H7 during the country's third largest beef recall in September 2007. Although some point to this large recall as a random event, others fear it as a sign of a decline in improvements made by the meat industry to reduce E. coli (15). In any case, meat processors need to remain diligent in their efforts to promote food safety.
Salmonella and E. coli O157:H7, both of which are found in the intestinal tracts of infected animals, are pathogens of concern for processors that produce raw ground meat and poultry products. If not eliminated during slaughter operations, these pathogens can be present on raw meat and poultry entering the grinder. The prevalence of Salmonella spp. in ground beef decreased from a baseline value of 7.5% in 1996 to 2.0% in 2006 (21), yet outbreaks of human Salmonella infections associated with ground beef continue to occur (6). The prevalence of Salmonella in ground turkey also has decreased, from a baseline value of 49.9% in 1996 to 20.3% in 2006 (21). However, Salmonella levels have remained the same in ground chicken, with a prevalence of about 45% (21). The overall incidence of foodborne illness from Salmonella has risen to 14.81 cases per 100,000 in 2006, from a baseline value of 13.7 cases per 100,000 in 1997 (7). The prevalence of E. coli O157:H7 in raw ground beef decreased from 0.80% in 2001 to 0.18% in 2004, and then remained stable until 2006. However, the prevalence increased in 2007 to 0.23% (24). Similarly, the number of beef recalls associated with E. coli O157:H7 increased from 8 in 2006 to 20 in 2007 (23).

The pathogen L. monocytogenes is of particular concern to meat and poultry processors because it can survive and grow in refrigerated, packaged, ready-to-eat (RTE) products as well as in vacuum-packaged products and because it resists high levels of salt, nitrite and acid as well as freezing and drying (10). Although the incidence of foodborne illness from L. monocytogenes decreased from 0.50 cases per 100,000 in 1997 to 0.31 cases in 2006, this is still higher than the Healthy People 2010 goal of 0.25 cases per 100,000 (7).

Under the Federal Meat Inspection Act and the Poultry Products Inspection Act, the US Department of Agriculture’s Food Safety and Inspection Service (USDA, FSIS) is charged with the responsibility of protecting and regulating the safety of the nation’s meat and poultry supply. In 1999, FSIS set performance standards for cooked beef, roast beef, and cooked corned beef products; fully and partially cooked meat patties; and certain fully and partially cooked poultry products (9 CFR 301, 317, 318, 320, and 381). In 2003, FSIS passed an interim final rule (9 CFR 430) requiring establishments that produce certain ready-to-eat (RTE) meat and poultry products to control for L. monocytogenes. Additionally, all plants producing raw ground beef, chicken, and turkey are subject to Salmonella testing by inspection personnel, and plants producing ground beef are subject to testing for E. coli O157:H7 (18, 20). Processing plants may have implemented pathogen-control practices and other food safety practices in response to these requirements as well as to the 1996 Pathogen Reduction and Hazard Analysis Critical Control Point rule (PR-HACCP), and other FSIS regulations.

FSIS contracted with RTI International to conduct a national survey of meat and poultry processing plants (i.e., plants without slaughter operations) to collect uniform information on practices and technologies for regulated plants, and plants producing ground beef are subject to testing for E. coli O157:H7 (18, 20). Processing plants may have implemented pathogen-control practices and other food safety practices in response to these requirements as well as to the 1996 Pathogen Reduction and Hazard Analysis Critical Control Point rule (PR-HACCP), and other FSIS regulations.

The sampling methods, questionnaire development, survey administration, and analysis procedures are described below.

**METHODS**

**Sampling methods**

An FSIS database of active meat, poultry, and egg products establishments was used to develop the sampling frames for federally inspected and state-inspected plants. The sampling frame included meat and poultry processing plants that produce RTE products, not-ready-to-eat (NRTE) products, or products that are to be processed further (such as raw ground product). Plants that conduct slaughter activities may also conduct processing activities, but because those plants were surveyed previously (4, 5), they were excluded from the sampling frame. Plants that operate for objectives that are not strictly commercial (e.g., nonprofit, prison, education, and government facilities) and plants located in a US territory (because of the potential for language barriers to completing the survey) were also excluded.

The sample design specified a sample size that was expected to yield ± 5 percent or better for estimates of all proportions. The sample was stratified by inspection status (federal versus state) and HACCP size (large plants have 500 or more employees, small plants have 10 or more employees but fewer than 500, and very small plants have fewer than 10 employees or less than $2.5 million in annual sales). For federally inspected plants, we selected a systematic sample of very small and small plants, and we took a census of large plants because of the relatively small number of these plants. For state-inspected plants, none of which were classified as large, we selected a systematic sample of very small plants and took a census of small plants. Systematic sampling ensures that the selected sample represents the population by forcing the sample to include plants with varying characteristics, such as geographic location and type of species.
and evaluated the structure and effectiveness of the questionnaire form. We also tested the questionnaire with personnel at processing plants and with industry trade associations; we subsequently revised the questionnaire based on their suggestions. The survey instrument and study design were approved by the Office of Management and Budget's (OMBs) information collection clearance process.

**Survey administration**

We implemented a variety of procedures aimed at maximizing the response rate to the survey, including many of the procedures recommended by Dillman (11). Various industry trade associations sent e-mails and posted information in their newsletters to encourage their membership to participate in the survey. We administered the survey over a period of approximately 18-weeks from July to November 2005. We contacted plants by telephone to screen for eligibility and to identify the target respondent for the survey, mailed the questionnaire via Federal Express to target respondents, sent a thank-you/reminder postcard, and made a series of follow-up telephone calls to non-respondents to encourage participation.

We received 944 completed surveys; 423 plants were eligible but did not complete the survey (i.e., non-respondents); 183 plants were ineligible (e.g., they conducted slaughter activities or were out of business); and, for 102 plants, we were unable to determine their eligibility for the survey. We calculated weighted response rates (respondents / [non-respondents + respondents]) by stratum, using the initial sampling weights adjusted for unknown eligibility so that cases with unknown eligibility were distributed between those eligible (non-respondents) and those ineligible in the same proportions that existed among cases with known eligibility. Ineligible plants were excluded from the response rate calculation. The overall weighted response rate was 66%. Response rates were higher for federally inspected plants than for state-inspected plants, and response rates were higher for large and small plants than for very small plants.

**Analysis procedures**

Before tabulating the survey data, we conducted data editing and coding. The edited and coded questionnaires were double-keyed for quality control purposes. To prepare the analysis dataset, we systematically reviewed the keyed data to identify and address any inconsistencies and outlying values. We weighted the survey data to reflect the selection probabilities of sampled establishments and to compensate for differential non-response. We performed \( \chi^2 \) tests to determine if differences in responses between HACCP plant sizes were statistically significant (i.e., large versus very small and small versus very small). Additionally, for some analyses, we performed \( \chi^2 \) tests to determine if differences in responses between plant types were statistically significant (i.e., plants producing RTE product versus NRTE product and plants producing RTE product versus inputs to further processing). All analyses were conducted using Stata, a statistical analysis software tool that takes the stratified sample design into consideration when computing variances (16).
TABLE 1. Plant characteristics of meat and poultry processors

<table>
<thead>
<tr>
<th>Plant Characteristics</th>
<th>Percentage of Plants</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of processing shifts operated daily</td>
<td></td>
</tr>
<tr>
<td>One</td>
<td>81.7</td>
</tr>
<tr>
<td>Two or three</td>
<td>17.4</td>
</tr>
<tr>
<td>No response</td>
<td>0.9</td>
</tr>
<tr>
<td>Number of clean-up shifts operated daily</td>
<td></td>
</tr>
<tr>
<td>None</td>
<td>3.6</td>
</tr>
<tr>
<td>Clean-up shift is not operated daily</td>
<td>3.1</td>
</tr>
<tr>
<td>One</td>
<td>75.5</td>
</tr>
<tr>
<td>Two or three</td>
<td>16.8</td>
</tr>
<tr>
<td>No response</td>
<td>1.0</td>
</tr>
<tr>
<td>Number of USDA- or state-inspected plants owned by the company that owns this plant</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>79.6</td>
</tr>
<tr>
<td>2 to 5</td>
<td>12.2</td>
</tr>
<tr>
<td>6 to 20</td>
<td>3.1</td>
</tr>
<tr>
<td>21 or more</td>
<td>2.9</td>
</tr>
<tr>
<td>No response</td>
<td>1.0</td>
</tr>
<tr>
<td>Total plant sales revenue</td>
<td></td>
</tr>
<tr>
<td>Under $2.5 million</td>
<td>53.4</td>
</tr>
<tr>
<td>$2.5 million to $49.9 million</td>
<td>31.6</td>
</tr>
<tr>
<td>$50.0 million to $249.9 million</td>
<td>7.5</td>
</tr>
<tr>
<td>$250.0 million or more</td>
<td>1.6</td>
</tr>
<tr>
<td>No response</td>
<td>5.9</td>
</tr>
</tbody>
</table>

RESULTS AND DISCUSSION

Survey results are presented for plant characteristics, food safety technologies and practices, microbiological testing practices, and employee food safety training. Although meat and poultry processing plants are regulated by FSIS, they are allowed to use a variety of technologies and practices to achieve food safety. Many plants use voluntary microbiological testing to confirm that their processes are working.

Plant characteristics

The majority of meat and poultry processing plants are very small (62%), although very small plants account for only 14% of total industry revenue. Thirty-six percent of plants are small; these account for the largest share of total industry revenue (63%). Large plants comprise only 2% of the industry but account for 22% of revenue. More than half of the plants were built or renovated after 1990. The mean plant size is 36,704 square feet (with a range of 64 to 4 million square feet), and the mean number of employees is 71 (with a range of 1 to 13,000 employees). Additional information on plant characteristics, such as number of shifts operated and number of plants owned by the company, is displayed in Table 1.

The majority of plants use pork (82%), beef (79%), and chicken (59%) as inputs to production. Figure 1 shows the percentage of plants producing RTE, NRTE, or both RTE and NRTE products. Most meat and poultry product volume is raw product and fully cooked, not-shelf-stable product (e.g., fully cooked hams, corned beef, and meat and poultry salads). More than one-third of plants import raw meat or poultry from other countries for further processing.

Food safety technologies and practices

The interim final rule on the control of L. monocytogenes in RTE meat and poultry products encourages producers of RTE products to use antimicrobial ingredients such as sodium acetate or sodium diacetate in formulation, postlethality treatments, and other intervention technologies, to reduce the presence or growth of Listeria (2). Additionally, plants producing RTE and NRTE products may implement technologies and practices to control Salmonella, E. coli, C. perfringens,
TABLE 2. Food safety technologies used by meat and poultry processors, by HACCP size (percentage of plants)

<table>
<thead>
<tr>
<th>Technology</th>
<th>Very Small</th>
<th>Small</th>
<th>Large</th>
<th>All Plants</th>
</tr>
</thead>
<tbody>
<tr>
<td>Metal detection equipment</td>
<td>7.6</td>
<td>60.5+++</td>
<td>92.9+++</td>
<td>29.3</td>
</tr>
<tr>
<td>Conveyor belts made of materials to prevent bacterial growth</td>
<td>13.8</td>
<td>40.6+++</td>
<td>39.3+++</td>
<td>24.3</td>
</tr>
<tr>
<td>Bioluminescent testing system for preoperative sanitation checks</td>
<td>6.9</td>
<td>29.9+++</td>
<td>64.4+++</td>
<td>16.8</td>
</tr>
<tr>
<td>Decontamination interventions</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Application of antimicrobial chemicals</td>
<td>25.3</td>
<td>42.2+++</td>
<td>63.1+++</td>
<td>32.5</td>
</tr>
<tr>
<td>High-pressure processing</td>
<td>2.1</td>
<td>7.2+++</td>
<td>10.7+++</td>
<td>4.2</td>
</tr>
<tr>
<td>Infrared technology</td>
<td>0.5</td>
<td>4.2+++</td>
<td>9.6+++</td>
<td>2.1</td>
</tr>
<tr>
<td>Irradiation equipment</td>
<td>0.8</td>
<td>0.3</td>
<td>1.2</td>
<td>0.6</td>
</tr>
<tr>
<td>Other types of pasteurization</td>
<td>7.5</td>
<td>14.6+++</td>
<td>20.2+++</td>
<td>10.4</td>
</tr>
</tbody>
</table>

+++ = Difference between small and very small plants is statistically significant at 0.01 level.
++ = Difference between small and very small plants is statistically significant at 0.05 level.
+ = Difference between small and very small plants is statistically significant at 0.10 level.
*** = Difference between large and very small plants is statistically significant at 0.01 level.
** = Difference between large and very small plants is statistically significant at 0.05 level.
* = Difference between large and very small plants is statistically significant at 0.10 level.

and other pathogens during processing operations to meet current and proposed performance standards. These technologies might include conveyor belts made of materials designed to prevent bacterial growth, or decontamination interventions such as the use of antimicrobial chemicals, pasteurization, or high-pressure processing.

Table 2 presents the percentage of plants that use various food safety technologies, by HACCP size. Less than one-third of all plants use each of the technologies asked about in the survey, although small and large plants report significantly higher usage of these technologies than very small plants (P < 0.01). Large plants can justify the investment in new technologies because of economies of scale and the possibility of a large loss of market share in the event of a food safety incident (12). Table 3 shows the percentage of plants that use various food safety technologies, by the type of product produced. Generally, plants that produce RTE product or produce NRTE product (note that some plants produce multiple product types). This is not surprising, given that NRTE products will later go through lethality treatments and that plants producing inputs to further processing often must meet buyers’ purchase specifications for food safety. For example, plants producing RTE product are more likely to use other types of pasteurization or antimicrobial chemicals than plants that produce NRTE product (P < 0.01). Irradiation is used infrequently but most often used by plants that produce raw, not ground, primal cuts of beef, pork, or chicken. High-pressure processing and infrared technology are also used infrequently but are most often used by plants that produce fully cooked, not-shelf-stable beef, pork, chicken, or turkey products.

Current PR:HACCP regulations require that plants have a sanitation plan, follow the plan, and keep records of sanitation practices; however, plants have some flexibility in choosing what practices to follow. Sanitation is particularly important for establishments producing RTE products because of the high risk of foodborne illness due to postlethality contamination prior to packaging. More than two-thirds of all plants used each of the sanitation practices that we asked about in the survey, as shown in Table 4. Use of sanitation practices and other food safety practices were similar across plant size. Smaller plants are more likely to use sanitation practices rather than technologies to achieve food safety, presumably because of the higher cost of installing and maintaining food safety technologies.

Other practices that processors might employ to assist in achieving food safety include conducting audits of their operations, protecting against bioterrorism, and controlling hazardous chemicals (see Tables 4 and 5). Many of these practices are similar to those in the best practices guidelines developed by the Beef Industry Food Safety Council (BIFSCO). For producers of raw ground product, BIFSCO recommends selecting raw material suppliers based on their controls for food safety and foreign material contamination and their product testing (1). Furthermore, based on Scanga et al. (14), one of the most
TABLE 3. Food safety technologies used by meat and poultry processors, by type of product produced (percentage of plants)

<table>
<thead>
<tr>
<th>Food Safety Technology</th>
<th>RTE Products</th>
<th>NRTE Products</th>
<th>Inputs to Further Processing</th>
<th>All Plants</th>
</tr>
</thead>
<tbody>
<tr>
<td>Metal detection equipment</td>
<td>34.6</td>
<td>26.8+++</td>
<td>54.7***</td>
<td>29.3</td>
</tr>
<tr>
<td>Conveyor belts made of materials to prevent bacterial growth</td>
<td>24.1</td>
<td>23.2</td>
<td>32.6**</td>
<td>24.3</td>
</tr>
<tr>
<td>Bioluminescent testing system for preoperative sanitation checks</td>
<td>20.1</td>
<td>14.7+++</td>
<td>30.9***</td>
<td>16.8</td>
</tr>
<tr>
<td>Decontamination interventions</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Application of antimicrobial chemicals</td>
<td>42.4</td>
<td>30.3+++</td>
<td>45.4</td>
<td>32.5</td>
</tr>
<tr>
<td>High-pressure processing</td>
<td>4.9</td>
<td>3.8</td>
<td>7.4</td>
<td>4.2</td>
</tr>
<tr>
<td>Infrared technology</td>
<td>3.0</td>
<td>2.4</td>
<td>5.5*</td>
<td>2.1</td>
</tr>
<tr>
<td>Irradiation equipment</td>
<td>0.3</td>
<td>0.7</td>
<td>1.1</td>
<td>0.6</td>
</tr>
<tr>
<td>Other types of pasteurization</td>
<td>14.5</td>
<td>8.3+++</td>
<td>22.3**</td>
<td>10.4</td>
</tr>
</tbody>
</table>

RTE = ready-to-eat; NRTE = not ready-to-eat.

Note: Plants may produce products in more than one category and thus may be represented in more than one column of this table.

+++ = Difference between plants producing RTE product versus NRTE product is statistically significant at 0.01 level.
++ = Difference between plants producing RTE product versus NRTE product is statistically significant at 0.05 level.
+ = Difference between plants producing RTE product versus NRTE product is statistically significant at 0.10 level.
*** = Difference between plants producing RTE product versus inputs to further processing is statistically significant at 0.01 level.
** = Difference between plants producing RTE product versus inputs to further processing is statistically significant at 0.05 level.
* = Difference between plants producing RTE product versus inputs to further processing is statistically significant at 0.10 level.

important ways for meat processors to reduce pathogens is to reduce the microbial load of incoming product. About two-thirds of all plants stipulate practices for controlling pathogens in purchase specifications for raw meat and poultry; based on the survey results, very small plants are somewhat more likely than large plants to use this practice (P < 0.05). These plants are also more likely to conduct independent audits and have a quality control or quality assurance department (P < 0.01).

Microbiological testing practices

Seventy-one percent of meat and poultry plants conduct voluntary testing of raw product and/or finished product for pathogens of concern, such as Salmonella and E. coli (Table 6). Processors conduct microbiological testing as a means to check their suppliers, satisfy contracts with their customers, and verify that their processes produce safe food (22). Meat and poultry plants that manufacture RTE product that is exposed to the environment after lethality treatments may also conduct testing of food contact surfaces to verify that their activities for controlling L. monocytogenes are effective.

One-half of plants that receive raw meat test it before fabrication, grinding, or further processing. The majority of these plants test raw meat for E. coli O157:H7 (75%), Salmonella species (57%), and generic E. coli (56%). Surprisingly, 48% test
<table>
<thead>
<tr>
<th>Sanitation and Food Safety Practice</th>
<th>Very Small</th>
<th>Small</th>
<th>Large</th>
<th>All Plants</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sanitation Practices</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Routinely sanitizes equipment that contacts RTE product*</td>
<td>94.6+++</td>
<td>87.1+</td>
<td>100.0**</td>
<td>90.6</td>
</tr>
<tr>
<td>Routinely sanitizes hands after contacting RTE product*</td>
<td>81.0</td>
<td>87.1+</td>
<td>93.2**</td>
<td>83.8</td>
</tr>
<tr>
<td>Routinely sanitizes hands after contacting raw meat or poultry*</td>
<td>72.6</td>
<td>75.1</td>
<td>72.6</td>
<td>73.5</td>
</tr>
<tr>
<td>Sanitizes hand tools during operations</td>
<td>88.3</td>
<td>89.1</td>
<td>83.3</td>
<td>88.5</td>
</tr>
<tr>
<td>Sanitizes drains for pathogen control</td>
<td>80.3</td>
<td>88.8+++</td>
<td>90.5***</td>
<td>83.7</td>
</tr>
<tr>
<td>Rotates sanitizers annually or more frequently</td>
<td>62.8</td>
<td>74.7+++</td>
<td>75.0***</td>
<td>67.5</td>
</tr>
<tr>
<td>Other Practices</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Treats food contact equipment and surfaces to remove biomatter during operations</td>
<td>59.0</td>
<td>57.3</td>
<td>61.9</td>
<td>58.5</td>
</tr>
<tr>
<td>Uses antimicrobial treatment for food contact equipment during operations</td>
<td>44.6</td>
<td>49.4</td>
<td>58.4***</td>
<td>46.7</td>
</tr>
<tr>
<td>Stipulates practices for controlling pathogens in purchase specifications for raw meat and poultry*</td>
<td>64.2</td>
<td>65.1</td>
<td>51.1***</td>
<td>64.2</td>
</tr>
<tr>
<td>Stipulates practices for controlling chemical residues in purchase specifications for raw meat and poultry*</td>
<td>32.8</td>
<td>42.6+++</td>
<td>47.0***</td>
<td>36.8</td>
</tr>
<tr>
<td>Has written policies and procedures for recalls</td>
<td>72.5</td>
<td>86.5+++</td>
<td>97.6***</td>
<td>78.3</td>
</tr>
<tr>
<td>Has written policies and procedures to control hazardous chemicals</td>
<td>66.5</td>
<td>79.3+++</td>
<td>96.4***</td>
<td>72.0</td>
</tr>
<tr>
<td>Has written policies and procedures to protect against bioterrorism</td>
<td>29.8</td>
<td>56.9+++</td>
<td>89.3***</td>
<td>41.3</td>
</tr>
<tr>
<td>Identifies and tracks products by production lot, backward to specific suppliers</td>
<td>69.4</td>
<td>82.9+++</td>
<td>96.4***</td>
<td>75.0</td>
</tr>
<tr>
<td>Identifies and tracks products by production lot, forward to specific buyers</td>
<td>61.9</td>
<td>79.2+++</td>
<td>94.0***</td>
<td>69.1</td>
</tr>
<tr>
<td>Conducts independent audits of processing operations</td>
<td>21.1</td>
<td>64.5+++</td>
<td>96.4***</td>
<td>39.0</td>
</tr>
<tr>
<td>Has quality control/quality assurance department</td>
<td>34.3</td>
<td>72.2+++</td>
<td>97.6***</td>
<td>49.9</td>
</tr>
</tbody>
</table>

RTE = ready-to-eat; NRTE = not ready-to-eat.

*For respondents that produce RTE product.

*For respondents that purchase raw meat and poultry.

See Table 2 for description of notation used to indicate statistical significance.

raw meat for \textit{Listeria} species. Twenty-one percent of plants that receive raw poultry test it before fabrication, grinding, or further processing. The majority of these plants test raw poultry for \textit{generic E. coli} (69%), total coliforms (62%), aerobic plate count (53%), and \textit{Salmonella} species (53%); nearly one-half test for total plate count (47%) and \textit{Listeria} species (49%). For plants that conduct microbiological testing and produce RTE products, 79% test RTE product after packaging. Table 6 identifies the pathogens for which testing is conducted.

In testing raw meat, plants use a variety of testing methods, including traditional cultural methods (27%), enzyme-linked immunoassay (ELISA) (8%), polymerase chain reaction (5%), and other rapid methods (12%). Sixty-two percent of plants did not know which
### TABLE 5. Sanitation and other food safety practices used by meat and poultry processors, by type of product produced (percentage of plants)

<table>
<thead>
<tr>
<th>Sanitation and Food Safety Practice</th>
<th>RTE Products</th>
<th>NRTE Products</th>
<th>Inputs to Further Processing</th>
<th>All Plants</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Sanitation Practices</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Routinely sanitizes equipment that contacts RTE product*</td>
<td>90.6</td>
<td>92.0</td>
<td>87.6</td>
<td>90.6</td>
</tr>
<tr>
<td>Routinely sanitizes hands after contacting RTE product*</td>
<td>83.8</td>
<td>84.8</td>
<td>81.9</td>
<td>83.8</td>
</tr>
<tr>
<td>Routinely sanitizes hands after contacting raw meat or poultry*</td>
<td>74.5</td>
<td>74.5</td>
<td>73.1</td>
<td>73.5</td>
</tr>
<tr>
<td>Sanitizes hand tools during operations</td>
<td>90.5</td>
<td>88.6</td>
<td>87.7</td>
<td>88.5</td>
</tr>
<tr>
<td>Sanitizes drains for pathogen control</td>
<td>89.3+++</td>
<td>83.9+++</td>
<td>91.1</td>
<td>83.7</td>
</tr>
<tr>
<td>Rotates sanitizers annually or more frequently</td>
<td>70.5</td>
<td>68.1</td>
<td>74.4</td>
<td>67.5</td>
</tr>
<tr>
<td><strong>Other Practices</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Treats food contact equipment and surfaces to remove biomatter during operations</td>
<td>62.8</td>
<td>58.5+</td>
<td>51.9***</td>
<td>58.5</td>
</tr>
<tr>
<td>Uses antimicrobial treatment for food contact equipment during operations</td>
<td>53.6</td>
<td>45.5+++</td>
<td>44.0**</td>
<td>46.7</td>
</tr>
<tr>
<td>Stipulates practices for controlling pathogens in purchase specifications for raw meat and poultry*</td>
<td>60.4</td>
<td>67.5+++</td>
<td>65.1</td>
<td>64.2</td>
</tr>
<tr>
<td>Stipulates practices for controlling chemical residues in purchase specifications for raw meat and poultry*</td>
<td>36.1</td>
<td>37.2</td>
<td>44.5**</td>
<td>36.8</td>
</tr>
<tr>
<td>Has written policies and procedures for recalls</td>
<td>81.6</td>
<td>76.9++</td>
<td>85.6</td>
<td>78.3</td>
</tr>
<tr>
<td>Has written policies and procedures to control hazardous chemicals</td>
<td>72.4</td>
<td>71.8</td>
<td>81.1**</td>
<td>72.0</td>
</tr>
<tr>
<td>Has written policies and procedures to protect against bioterrorism</td>
<td>44.8</td>
<td>39.1+</td>
<td>53.8**</td>
<td>41.3</td>
</tr>
<tr>
<td>Identifies and tracks products by production lot, backward to specific suppliers</td>
<td>74.2</td>
<td>74.8</td>
<td>82.5**</td>
<td>75.0</td>
</tr>
<tr>
<td>Identifies and tracks products by production lot, forward to specific buyers</td>
<td>70.9</td>
<td>66.6++</td>
<td>82.3***</td>
<td>69.1</td>
</tr>
<tr>
<td>Conducts independent audits of processing operations</td>
<td>44.9</td>
<td>35.4+++</td>
<td>62.9***</td>
<td>39.0</td>
</tr>
<tr>
<td>Has quality control/quality assurance department</td>
<td>56.1</td>
<td>45.1+++</td>
<td>67.5***</td>
<td>49.9</td>
</tr>
</tbody>
</table>

RTE = ready-to-eat; NRTE = not ready-to-eat.

Note: Plants may produce products in more than one category and thus may be represented in more than one column of this table.

*For respondents that produce RTE product.

*For respondents that purchase raw meat and poultry.

See Table 3 for description of notation used to indicate statistical significance.
testing method was used. (Note that respondents could select multiple responses; thus, the responses do not sum to 100%.) These results were similar for testing of raw poultry, RTE finished product, and NRTE finished product.

Seventy percent of plants conduct environmental sampling in addition to product testing (Table 7). Environmental sampling includes sampling of equipment surfaces and facility surfaces such as walls, drains, and floors. Of those plants that perform environmental sampling, 56% use traditional cultural methods and 84% routinely test product contact surfaces for Listeria species. L. monocytogenes can be found on drains, processing floors, and equipment within meat and poultry processing plants (17). Furthermore, biofilms of L. monocytogenes may exist in areas of meat and poultry processing plants that are not easy to clean or sanitize, such as welding joints or corners (13).

Employee food safety training

The majority of meat and poultry processing plants conduct food safety training with newly hired production employees and with current employees on a continuing basis, as shown in Table 8. Large plants and small plants are more likely to provide food safety training than very small plants (P < 0.10). The training may be formal training conducted by plant personnel or professional trainers,
informal on-the-job training, or use of written materials. For newly hired production employees, plants are more likely to provide on-the-job food safety training (scheduled, 36%; unscheduled, 66%) and written materials (36%). To train production employees on an ongoing basis, 73% of plants provide informal, on-the-job food safety training. Some plants also use written materials (24%), scheduled on-the-job training (27%), and formal course work conducted by plant personnel (20%) as methods of continually training production employees.

**CONCLUSIONS**

We conducted a mail survey of meat and poultry processing plants to collect uniform information on practices and technologies used to control pathogens and promote food safety. The survey was nationally representative and had a high response rate (66%). Although the data are self-reported and the extent of self-reporting bias is unknown, the survey results provide a unique and comprehensive view of food safety practices used by meat and poultry processors.

The majority of plants conduct voluntary microbiological testing of product and environmental sampling to ensure that their procedures are effective in reducing or eliminating pathogens. Plants test for a variety of pathogens, including *Salmonella*, *E. coli*, and *Listeria*. Almost all plants provide food safety training for newly hired employees and offer training on a continuing basis for production employees.

As expected, the survey findings suggest that most plants, particularly very small plants, use sanitation and other practices, rather than technologies, to achieve food safety. Sanitation of hands, tools, and equipment were the most prevalent methods of preventing or eliminating microbial contamination. Increased adoption of technologies, including the use of antimicrobial chemicals such as sodium acetate and sodium diacetate, would help reduce pathogen loads (2). Similarly, increased use of practices such as independent food safety audits would have a positive effect and help produce safer meat and poultry products.

In general, large and small plants are more likely than very small plants to use many types of food safety practices and technologies. To enhance adoption of food safety practices and technologies among small and very small plants, FSIS is targeting those plants with specific outreach activities (19). These activities include the establishment of a group at the Policy Development Division to respond to technical questions from small and very small plants, the creation of compliance guidelines to aid in understanding regulatory requirements, and the creation of a section of the FSIS Web site devoted to small and very small plants. In addition, FSIS is offering Web seminars to owners and operators of small and very small establishments to further aid in their understanding of regulations. FSIS also is identifying technologies that are feasible for smaller plants to implement in order to achieve food safety. As smaller plants generally have less scientific expertise, less automation, fewer resources, and a greater variety of products, these plants will likely benefit from these initiatives (9).

Practices and technologies implemented by meat and poultry processing plants for controlling foodborne pathogens and other hazards subsequently may help reduce the risk of foodborne illness. The survey findings, coupled with other data, can be used to characterize meat and poultry processing plants’ food safety risk management practices and may help inform the process for risk-based inspection and sampling, whereby plants with higher relative risk are inspected more rigorously or sampled more frequently.

**ACKNOWLEDGMENTS**

This work was funded by the US Department of Agriculture, Food Safety and Inspection Service (USDA, FSIS) (Contract no. 53-3A94-03-12). All views expressed here are those of the authors and not necessarily of USDA, FSIS. We thank Peter Siegel of RTI International for his assistance with developing the sample design and the survey weights, and Jeffrey Franklin and Nadia Paoli of RTI for managing the survey data collection. We also thank Ronald Meekhof of FSIS (Retired) for his guidance as the FSIS project manager.

**REFERENCES**


The International Association for Food Protection welcomes your nominations for our Association Awards. Nominate your colleagues for one of the Awards listed below. You do not have to be an IAFP Member to nominate a deserving professional. Nomination criteria is available at:

www.foodprotection.org

**Nominations deadline is February 3, 2009**

You may make multiple nominations. All nominations must be received at the IAFP office by February 3, 2009.

- Persons nominated for individual awards must be current IAFP Members. Black Pearl Award nominees must be companies employing current IAFP Members. GMA Food Safety Award nominees do not have to be IAFP Members.
- Previous award winners are not eligible for the same award.
- Executive Board Members and Awards Committee Members are not eligible for nomination.
- Presentation of awards will be during the Awards Banquet at IAFP 2009 – the Association’s 96th Annual Meeting in Grapevine, Texas on July 15, 2009.
Nominations will be accepted for the following Awards:

**Black Pearl Award**
Award Showcasing the Black Pearl, Sponsored by Wilbur Feagan and F&H Food Equipment Company
Presented in recognition of a company’s outstanding commitment to, and achievement in, corporate excellence in food safety and quality.

**Fellow Award**
Distinguished Plaque
Presented to Member(s) who have contributed to IAFP and its Affiliates with distinction over an extended period of time.

**Honorary Life Membership Award**
Plaque and Lifetime Membership in IAFP
Presented to Member(s) for their dedication to the high ideals and objectives of IAFP and for their service to the Association.

**Harry Haverland Citation Award**
Plaque and $1,500 Honorarium, Sponsored by ConAgra Foods, Inc.
Presented to an individual for many years of dedication and devotion to the Association ideals and its objectives.

**Food Safety Innovation Award**
Plaque and $2,500 Honorarium, Sponsored by 3M Microbiology
Presented to a Member or organization for creating a new idea, practice or product that has had a positive impact on food safety, thus, improving public health and the quality of life.

**International Leadership Award**
Plaque, $1,500 Honorarium and Reimbursement to attend IAFP 2009, Sponsored by Cargill, Inc.
Presented to an individual for dedication to the high ideals and objectives of IAFP and for promotion of the mission of the Association in countries outside of the United States and Canada.

**GMA Food Safety Award**
Plaque and $3,000 Honorarium, Sponsored by GMA
This Award alternates between individuals and groups or organizations. In 2009, the award will be presented to an individual in recognition of a long history of outstanding contributions to food safety research and education.

**Maurice Weber Laboratorian Award**
Plaque and $1,500 Honorarium, Sponsored by Weber Scientific
Presented to an individual for outstanding contributions in the laboratory, recognizing a commitment to the development of innovative and practical analytical approaches in support of food safety.

**Sanitarian Award**
Plaque and $1,500 Honorarium, Sponsored by Ecolab Inc.
Presented to an individual for dedicated and exceptional service to the profession of Sanitarian, serving the public and the food industry.

**Elmer Marth Educator Award**
Plaque and $1,500 Honorarium, Sponsored by Nelson-Jameson, Inc.
Presented to an individual for dedicated and exceptional contributions to the profession of the Educator.

**Harold Barnum Industry Award**
Plaque and $1,500 Honorarium, Sponsored by Nasco International, Inc.
Presented to an individual for dedication and exceptional service to IAFP, the public, and the food industry.

**Larry Beuchat Young Researcher Award**
Plaque and $2,000 Honorarium, Sponsored by bioMérieux, Inc.
Presented to a young researcher who has shown outstanding ability and professional promise in the early years of their career.
AFFILIATE OFFICERS

ALABAMA ASSOCIATION FOR FOOD PROTECTION
Pres., Carolyn Suber ......................................................... Sylacauga
Pres. Elect, James Congleton ........................................... Tuscaloosa
Vice Pres., Dennis Bogart ................................................. Birmingham
Past Pres., Patricia Lindsey ................................................ Cullman
Sec’y./Treas., Karen Crawford .......................................... Tuscaloosa
Delegate, Tom McCaskey .................................................. Auburn
Mail all correspondence to:
G. M. Gallaspy
P.O. Box 303017, Suite 1250
Montgomery, AL 36130-3017
334.206.5375 E-mail: ggallaspy@adph.state.al.us

ALBERTA ASSOCIATION FOR FOOD PROTECTION
Pres., Kevin Webster ....................................................... Edmonton
Past Pres., Gary Gensler .................................................. Edmonton
Sec’y, Barb Tomik .............................................................. Edmonton
Treas., Susan Gibson ...................................................... Edmonton
Delegate, Lynn M. McMullen .......................................... Edmonton
Mail all correspondence to:
Lynn M. McMullen
University of Alberta
Dept. of Ag., Food and Nutritional Science
4-10 Ag. For. Center
Edmonton, Alberta T6G 2P5 Canada
780.492.6015 E-mail: lynn.mcmullen@ualberta.ca

ARIZONA ENVIRONMENTAL HEALTH ASSOCIATION
Pres., Tom Dominick ....................................................... Phoenix
Past Pres., Mohammed Heydari .......................................... Phoenix
Sec’y, Shikha Gupta ....................................................... Phoenix
Treas., Norman Barnett .................................................. Tolleson
Delegate, Tom Dominick ............................................... Chandler
Mail all correspondence to:
Tom Dominick
Bashas’, Inc.
P.O. Box 488
Chandler, AZ 85244-0488
602.594.1356 E-mail: tdominick@bashas.com

AUSTRALIAN ASSOCIATION FOR FOOD PROTECTION
Pres., Patricia Desmarchelier .......................................... Queensland
Sec’y., Gary Dykes ......................................................... Queensland
Delegate, Patricia Desmarchelier .................................. Queensland
Mail all correspondence to:
Patricia Desmarchelier
Food Science Australia
Tingalpa D.C.
P.O. Box 3312
Brisbane, Queensland 4173 Australia
61.7.3214.2032 E-mail: patricia.desmarchelier@csiro.au

BRAZIL ASSOCIATION FOR FOOD PROTECTION
Pres., Ivone Delazari ...................................................... São Paulo
Vice Pres., Ellen Lopes .................................................. São Paulo
Past Pres., Maria Teresa Destro ...................................... São Paulo
Sec’y., Elaine De Martins ................................................ Ribeirão
Treas., Bernadette D.G.M. Franco ................................... São Paulo
Delegate, Maria Teresa Destro ....................................... São Paulo
Mail all correspondence to:
Maria Teresa Destro
Univ. São Paulo
Av. Prof. Lineu Prestes 580 B14
São Paulo, SP 05.508-900 Brazil
55.113.091.2199 E-mail: mtdestro@usp.br

BRITISH COLUMBIA FOOD PROTECTION ASSOCIATION
Pres., Terry Peters ....................................................... Vancouver
Vice Pres., Annette Moore .............................................. Richmond
Sec’y., Michael Mensah-Wilson .................................... Langley
Treas., Lorraine McIntyre ............................................... Vancouver
Delegate, Terry Peters .................................................. Richmond
Mail all correspondence to:
Terry Peters
5500 Woodpecker Drive
Richmond, British Columbia V7E 5A8 Canada
604.666.1080 E-mail: terry_peters@telus.net

CALIFORNIA ASSOCIATION OF DAIRY AND MILK SANITARIANS
Pres., Michelle Clark .................................................... Hayward
1st Vice Pres., Ross Henderson-McBean ......................... Sacramento
2nd Vice Pres., Sarah Houston ....................................... Fairfield
Past Pres., Dawn Stead ................................................ Woodland Hills
Exec. Sec’y/Treas., John Bruhn ..................................... Davis
Delegate, John Bruhn .................................................. Davis
Mail all correspondence to:
John C. Bruhn
University of California-Davis
Dairy Research and Information Center
101B Cruess Hall
Davis, CA 95616-8598
530.752.2192 E-mail: jcbruhn@ucdavis.edu

CAPITAL AREA FOOD PROTECTION ASSOCIATION
Pres., LeeAnne Jackson ................................................. College Park, MD
Past Pres., Randy Huffman ............................................ Arlington, VA
Treas., Alan Parker ....................................................... Annapolis, MD
Delegate, Carl Custer .................................................. Bethesda, MD
Mail all correspondence to:
Carl S. Custer
8605 Hartsdale Ave.
Bethesda, MD 20817-3619
301.530.3753 E-mail: carl.custer@gmail.com
CAROLINAS ASSOCIATION FOR FOOD PROTECTION

Pres., Xiuping Jiang ........................................... Clemson, SC
Vice Pres./Treas., Steve Tracey .......................... Salisbury, NC
Past Pres., Paul Dawson ................................. Clemson, SC
Sec'y., Julie Northcutt .................................. Clemson, SC
Delegate, Xiuping Jiang .................................. Clemson, SC

Mail all correspondence to:
Xiuping Jiang
Clemson University
217 P & A Bldg.
Clemson, SC 29634
864.656.6932 E-mail: xiuping@clemson.edu

CONNECTICUT ASSOCIATION FOR FOOD PROTECTION

Pres., David Pantalone ........................................ Ansonia
Vice Pres./Treas., Karen Rotella .......................... Middlebury
Sec'y., Frank Greene .............................. Hartford
Delegate, Frank Greene .............................. Hartford

Mail all correspondence to:
Frank Greene
CT Dept. of Consumer Protection
Div. of Food and Standards
165 Capitol Ave., Room 165
Hartford, CT 06106
860.713.6160 E-mail: frank.greene@po.state.ct.us

FLORIDA ASSOCIATION FOR FOOD PROTECTION

Pres., Todd Rossow ................................. Lakeland
Pres. Elect, Eric Martin .............................. Orlando
Vice Pres., Gregory Orman ............................. Lithia Springs
Past Pres., Natalie Dyenson ............................. St. Cloud
Sec'y., Tom McMahan ................................ Lake Mary
Treas., Kristin Boncaro ............................... Deltona
Delegate, Peter Hibbard ................................ Oviedo

Mail all correspondence to:
Todd Rossow
Publix Super Markets, Inc.
P.O. Box 32024
Lakeland, FL 33802
863.688.7407 E-mail: todd.rossow@publix.com

GEORGIA ASSOCIATION FOR FOOD PROTECTION

Pres., Tonya Gray ........................................... Newman
Pres. Elect, Veneranda Gapud .......................... Snellville
Vice Pres., Mac Branch .................................. Marietta
Past Pres., C. Harold King ............................. Atlanta
Sec'y., Pamela Metheny ............................... Atlanta
Treas., Mark Norton ..................................... Atlanta
Delegate, Tonya Gray .................................... Newman

Mail all correspondence to:
Tonya D. Gray
27 Inland Cir.
Newnan, GA 30263
404.657.6710 E-mail: tonyaag@usa.net

IDAHO ENVIRONMENTAL HEALTH ASSOCIATION

Pres., Dale King ............................................ Orofino
Pres. Elect, Dee Johnson ............................. Soda Springs
Past Pres., Paul E. Guenther .......................... Lewiston
Sec'y./Treas., Steve Pew ............................... Pocatello
Delegate, Dale King ..................................... Orofino

Mail all correspondence to:
Dale King
105 – 115th St.
Orofino, ID 83544
208.476.7850 E-mail: dking@phd2.idaho.gov

ASSOCIATED ILLINOIS MILK, FOOD AND ENVIRONMENTAL SANITARIANS

Pres., Rebecca Thomas ................................... Peoria
Pres. Elect, Kris Zetterlund ................................ Cary
1st Vice Pres., Alan Lundin ............................ Cherry Valley
2nd Vice Pres., Mark Newport ......................... North Aurora
Past Pres., John Ellingson ............................. Rockford
Sec'y., Steve DiVincenzo .............................. Springfield
Treas., Dennis Gaalswyk .............................. Naperville
Delegate, Rebecca Thomas ............................ Peoria

Mail all correspondence to:
Stephen L. DiVincenzo
Illinois Dept. of Public Health
525 W. Jefferson
Springfield, IL 62761
217.785.2439 E-mail: Steve.DiVincenzo@illinois.gov

INDIANA ENVIRONMENTAL HEALTH ASSOCIATION, INC.

Pres., Lisa Harrison ........................................... Cloverdale
Pres. Elect, Mark Mattix ................................ Indianapolis
Vice Pres., Jason Doerflein ............................ Indianapolis
Past Pres., Patricia Minnick ............................ Indianapolis
Treas., Graham McKeen ............................... Indianapolis
Sec'y., Tami Barrett ................................. Indianapolis
Delegate, Helene Uhiman ......................... Hammond

Mail all correspondence to:
Lisa Harrison
Indiana State Dept. of Health
445 Stardust Way
Cloverdale, IN 46120
765.795.5456 E-mail: lharriso@isdh.in.gov

IOWA ASSOCIATION FOR FOOD PROTECTION

Pres., Lisa Pool ............................................. New Hampton
1st Vice Pres., Charlie Uhlenhopp .................. Arlington
2nd Vice Pres., Tom Tegeler ......................... Dyersville
Past Pres., Gary Yaddof .............................. Luana
Sec'y./Treas., Lynne Melchert ....................... Hopkinton
Delegate, Lisa Pool ..................................... New Hampton

Mail all correspondence to:
Lynne Melchert
117 Culver Road NE
Hopkinton IA 52237
563.926.2363 E-mail: lynnemelchert@swissvalley.com

DECEMBER 2008 | FOOD PROTECTION TRENDS 931
KANSAS ENVIRONMENTAL HEALTH ASSOCIATION
Pres., Scott Selee ................. Garden City
1st Vice Pres., Roger W. Daniels ... Erie
2nd Vice Pres., Keena Privat ... Emporia
Past Pres., Bronson Farmer ................. Salina
Sec’y, Marlene Stamm ................. Junction City
Treas., Greg Willis ................. Hoisington
Delegate, Scott Selee ................. Garden City

Mail all correspondence to:
Scott Selee
Southwest Kansas LEPG
409 Campus Drive, #101
Garden City, KS 67846
620.272.083 E-mail: lepg@sbcglobal.net

KENTUCKY ASSOCIATION OF MILK, FOOD AND ENVIRONMENTAL SANITARIANS
Pres., Tony Hall .......... Georgetown
Pres. Elect, Heath Stone ................. Danville
Vice Pres., Angela Billings ................. Frankfort
Past Pres., Vonita Grabel ................. Frankfort
Sec’y, Brenda Haydon ................. Waddy
Treas., Sue Jewell ................. Florence
Delegate, Tony Hall ................. Georgetown

Mail all correspondence to:
Tony Hall
Scott County Health Center
300 E. Washington St.
Georgetown, KY 40324
502.570.4861 E-mail: tony.hall@ky.gov

KOREA ASSOCIATION OF MILK, FOOD AND ENVIRONMENTAL SPECIALISTS
Pres., Deog-Hwan Oh .......... Kangwon
Vice Pres., Dong-Kwan Jeong .......... Pusan
Past Pres., Duck-Hwa Chung .......... Kyungnam
Sec’y, Sang-Do Ha .......... Gyeonggi
Treas., Sang-Do Ha .......... Gyeonggi
Delegate, Sang-Do Ha .......... Gyeonggi

Mail all correspondence to:
Deog-Hwan Oh
Kangwon National University
Div. of Food & Biotechnology
192-1, Hyoja 2 Dong
Chunchon, Kangwondo 200-701
South Korea
82.33.250.6457 E-mail: food411@hanmail.net

METROPOLITAN ASSOCIATION FOR FOOD PROTECTION
Pres., Gary Moore ................. West Caldwell, Nj
1st Vice Pres., Alan Talarsky .......... Trenton, Nj
2nd Vice Pres., David Reyda .......... Beminstem, Nj
Past Pres., Howard Rabinovich .......... North Wales, PA
Sec’y/Treas., Carol Schwar .......... Washington, Nj
Delegate, Donald Schaffner .......... New Brunswick, Nj

Mail all correspondence to:
Carol Schwar
Warren County Health Dept.
319 W. Washington Ave.
Washington, NJ 07882
908.689.6693 E-mail: cschwar@co.warren.nj.us

MEXICO ASSOCIATION FOR FOOD PROTECTION
Pres., Fausto Tejeda-Trujillo ................. Puebla
Vice Pres., Nanci E. Martinez .......... Guadalajara
Past Pres., Lydia Mota De La Garza .......... Mexico City
Sec’y, M. Refugio Torres-Vitela .......... Guadalajara
Treas., Norma Heredia ................. Monterrey
Delegate, Montserrat Hernandez-Itturriaga .......... Queretaro

Mail all correspondence to:
Alejandro Castillo
Texas A&M University
2471 TAMU
Kleberg Center, Room 314A
College Station, TX 77843-2471
979.845.3565 E-mail: a-castillo@tamu.edu

MICHIGAN ENVIRONMENTAL HEALTH ASSOCIATION
Pres., Bob Paulus .......... Grand Haven
Pres. Elect., Gene Paez .......... Corunna
Past Pres., Janet Phelps .......... Flint
Treas., John Texter .......... Middleville
Sec’y, Adeline Hambley .......... Holland
Delegate, Janet P. Phelps .......... Flint

Mail all correspondence to:
Janet A. Phelps
Genesee County Health Dept.
630 S. Saginaw St.
Flint, MI 48502-1540
810.257.3199 E-mail: jphelps@co.warren.nj.us

MISSISSIPPI ENVIRONMENTAL HEALTH ASSOCIATION
Pres., Tim Butts .......... Louisville
Past Pres., Anne Hogue .......... Canton
Sec’y/Treas., Elizabeth Lane .......... Brandon
Delegate, Tim Butts .......... Louisville

Mail all correspondence to:
Anne Hogue
Mississippi State Dept. of Health
317 N. Union
Canton, MS 39046
601.750.9916 E-mail: annehogue@msdh.state.ms.us

MISSOURI MILK, FOOD AND ENVIRONMENTAL HEALTH ASSOCIATION
Pres., Dayle Reynolds .......... Kansas City
Pres. Elect, Steve Sikes .......... Cape Girardeau
Vice Pres., Russell Lilly .......... Springfield
Past Pres., Steve Crawford .......... Hillsboro
Sec’y, Cathy Sullivan .......... Marshall
Treas., Gala Miller .......... Jefferson City
Delegate, Dayle Reynolds .......... Kansas City

Mail all correspondence to:
Dayle J. Reynolds
Roberts Dairy Company
3805 Emanuel Cleaver Blvd.
Kansas City, MO 64128-2781
800.279.2342 E-mail: dreynolds@robertsdairy.com
QUEBEC FOOD PROTECTION ASSOCIATION
Pres., Gisele LaPointe .................................................. Quebec
Pres. Elect, Julie Jean .................................................... Quebec
Vice Pres., Ismail Fliss .................................................. Quebec
Sec’y, Louise Blanchet .................................................. Quebec
Delegate, Julie Jean .................................................... Quebec
Mail all correspondence to:
Gisele LaPointe
Universite Laval
Dept. of Food Science and Nutrition
Quebec QC GIK 7P4 Canada
418.656.2131 ext. 5984  E-mail: gisele.lapointe@fsaa.ulaval.ca

SOUTH DAKOTA ENVIRONMENTAL HEALTH ASSOCIATION
Pres., Roger Puthoff ...................................................... Huron
Pres. Elect, Cindy Koopman-Viergets ................................ Pierre
Past Pres., Mark Schutzloffel ....................................... Sioux Falls
Sec’y./Treas., Mike Fillaus .......................................... Pierre
Delegate, Darwin Kurtenbach ...................................... Pierre
Mail all correspondence to:
Mike Fillaus
615 E. 4th St.
Pierre, SD 57501
605.773.6327  E-mail: mike.fillaus@state.sd.us

SOUTHERN CALIFORNIA ASSOCIATION FOR FOOD PROTECTION
Pres., Margaret Burton ................................................ San Diego
Pres. Elect, Kerry Bridges ............................................ San Diego
2nd Vice Pres., Greg Peterson ....................................... El Segundo
Past Pres., Rebecca Bednar ......................................... Vernon
Sec’y., Turonda Crumpler ............................................ La Palma
Treas., Margaret Burton ............................................. San Diego
Delegate, Marty Gushwa ............................................ Ventura
Mail all correspondence to:
Margaret Burton
Jack in the Box
9330 Balboa Ave.
San Diego, CA 92123
858.571.2441  E-mail: margaret.burton@jackinthebox.com

SPAIN ASSOCIATION FOR FOOD PROTECTION
Pres., Emiliano Quinto ................................................ Valladolid
Pres. Elect, David Rodriguez-Lazaro ............................ Valladolid
Vice Pres., Marta Hernandez-Perez ............................ Valladolid
Sec’y./Treas., Rosa Capita ........................................... Ponferrada
Delegate, Emiliano Quinto ......................................... Valladolid
Mail all correspondence to:
Emiliano J. Quinto
Avenida Palencia 37, 1-B
Valladolid 47010 Spain
34.983184943  E-mail: ejquinto@gmail.com

TENNESSEE ASSOCIATION OF MILK, WATER AND FOOD PROTECTION
Pres., Robert Owen ...................................................... Murfreesboro
Pres. Elect., Jim Howie ................................................ Waxhaw
Sec’y./Treas., F. Ann Draughon .................................... Knoxville
Delegate, F. Ann Draughon ........................................ Knoxville
Mail all correspondence to:
F. Ann Draughon
University of Tennessee
Food Safety & Processing Center
2605 River Road
Knoxville, TN 37996
865.974.8400  E-mail: draughon@utk.edu

TENNESSEE ASSOCIATION OF MILK, WATER AND FOOD PROTECTION
Pres., Toby Breland ...................................................... Tyler
Past Pres., Howard Depoy ........................................... Conroe
Sec’y./Treas., Alejandro Castillo ................................. College Station
Recording Sec’y., Catherine Hall ................................. Austin
Delegate, Fred Reimers ............................................... Schertz
Mail all correspondence to:
Alejandro Castillo
Texas A&M University
2471 TAMU
Kleberg Center Room 314A
College Station, TX 77843-2471
979.845.3565  E-mail: a-castillo@tamu.edu

TURKISH FOOD SAFETY ASSOCIATION
Pres., Samim Saner ...................................................... Istanbul
Vice Pres., Serap Nazir ................................................ Istanbul
Sec’y., Muhteber Ersin ................................................ Istanbul
Treas., Nerma Gokce ................................................... Istanbul
Delegate, Samima Saner ............................................ Istanbul
Mail all correspondence to:
Muhteber Ersin
Gida Guvenligi Dernegi (TFSA)
Hasan Amir Sok.Dursoy Is Mrk.
No. 4 K.4 D:10, Kiziltoprak
Istanbul, Turkey
0216.550.02.73  E-mail: muhteber.ersin@ggd.org.tr

UNITED ARAB EMIRATES ASSOCIATION FOR FOOD PROTECTION
Pres., Khalid Mohammed Sharif ................................ Dubai
Pres. Elect., Aisha Abushelaibi .................................. Dubai
Vice Pres., Mariam Shenasi ....................................... Dubai
Sec’y., Bashir Hassan Youisf ..................................... Dubai
Delegate, Bobby Krishna .......................................... Dubai
Mail all correspondence to:
Bobby Krishna
Dubai Municipality
P.O. Box 67
Food Control Dept.
Dubai, United Arab Emirates
971.50.3971157  E-mail: bobbykrishna@gmail.com
In Memory

James Jay

We extend our deepest sympathy to the family of James Jay who recently passed away. IAFP will always have sincere gratitude for his contribution to the Association and the profession. Dr. Jay has been a member of IAFP since 1982. In 1995, Dr. Jay presented the Ivan Parkin Lecture at the 82nd Annual Meeting. He has served on the editorial board of the Journal of Food Protection and is a fellow of IAFP, ASM, IFT and the American Publich Health Association.
Fellow IAFP Members:

As we prepare for a new year, I want to encourage you to become involved in the International Association for Food Protection’s (IAFP) Committees and Professional Development Groups (PDGs). Committees and PDGs are a vital part of the life of the Association. They are intended to be a forum whereby professionals with common interests in specific aspects of food safety come together to discuss, inform one another, and serve IAFP in the organization of symposia, preparation of white papers, and other scientific endeavors. The Committees and PDGs meet during the Annual Meeting and also share information throughout the year via conference calls or e-mail. Therefore, even if you are unable to attend IAFP 2009 in Grapevine, Texas, your involvement is still possible and your insight important. Please review the list of Committees and PDGs and their respective mission statements found on the following pages. If you find one that sounds interesting or relevant to you, simply contact the IAFP office to let us know which group you want to join. Getting started is really that simple.

On a more personal note, I have found participation in IAFP’s Committees and PDGs to be a truly rewarding experience. Committee and PDG involvement allows you to serve the greater good in so many ways. Firstly, it provides a forum for exchange of ideas with other professionals having similar food safety interests and expertise. It also allows you to serve our Association and your peers by providing your own unique talents and time in the promotion of food safety. And, while you are helping the Association and others, you’ll also be networking with leading experts in the field, learning from their experiences, and developing valued relationships. So, it’s a professional win-win. And that’s not even to mention the many friends that you’ll find in your IAFP colleagues!

For those of you who have participated in our Committees or PDGs in the past, I want to thank you for your service. We could not be the Association we are today without your valued participation. I encourage you to stay involved; your continued participation remains critical to the success and growth of IAFP.

As usual, your comments, questions, and suggestions are welcomed, and do not hesitate to contact the IAFP office or myself if we can be of help. And please join me in making 2008-2009 an active and vital year for the IAFP Committees and PDGs. We need the efforts of everyone as we seek to Advance Food Safety Worldwide.

Best Regards,

[Signature]

Lee-Ann Jaykus
Vice President, IAFP
IAFP Committee, Professional Development Group, Task Force and Affiliate Council Mission Statements

STANDING COMMITTEES

FPT Management Committee
The mission of the FPT Management Committee is to provide guidance to the Executive Board on matters concerning Food Protection Trends.

JFP Management Committee
The mission of the JFP Management Committee is to provide guidance to the Executive Board on matters concerning the Journal of Food Protection.

Program Committee
The mission of the Program Committee is to develop the Annual Meeting program, evaluate abstracts, identify symposia and speakers, identify all sessions' convenors, and oversee Developing Scientist Awards Committee.

SPECIAL COMMITTEES

3-A Committee on Sanitary Procedures
The mission of the 3-A Committee on Sanitary Procedures is to serve as IAFP representatives to the 3-A Sanitary Standards Committee; to review and provide comments on proposed changes and revisions to the 3-A Sanitary Standards.

Audiovisual Library Committee
The mission of the Audiovisual Library Committee is to review and evaluate audiovisual materials for accuracy and appropriateness of content, make recommendations regarding the purchase of audiovisual materials, and provide guidance on matters concerning the AV Library.

Awards Committee
The mission of the Awards Committee is to select recipients for the IAFP awards.

Black Pearl Selection Committee
The mission of the Black Pearl Selection Committee is to select the recipient of the Black Pearl Award.

Committee on Control of Foodborne Illness
The mission of the Committee on Control of Foodborne Illness is to review information on epidemiology and control of communicable diseases of primary concern to food safety and related areas, and prepare manuals and articles addressing investigation and control of food safety-related problems.

Constitution and Bylaws Committee
The mission of the Constitution and Bylaws Committee is to review and study the Constitution and Bylaws of IAFP and make recommendations to the Executive Board for changes to be considered for submission to the Membership for ratification.

Developing Scientist Awards Committee
The mission of the Developing Scientist Awards Committee is to select finalists and judge the Developing Scientist Awards Competition at the IAFP Annual Meeting.

Fellows Selection Committee
The mission of the Fellows Selection Committee is to solicit nominations and make recommendations to the Executive Board for eligible Members to be confirmed as Fellows by the Executive Board.

Foundation Committee
The mission of the Foundation Committee is to oversee IAFP Foundation monies, solicit gifts to the Foundation, and identify and fund programs which further the goals and objectives of the Association.

Membership Committee
The mission of the Membership Committee is to develop strategies to retain current members and attract new members.

Nominating Committee
The mission of the Nominating Committee is to select and submit names of nominees for the office of Executive Board Secretary for election by the IAFP Membership.

Past Presidents’ Committee
The mission of the Past Presidents’ Committee is to serve as an advisory committee to the Executive Board.

Tellers Committee
The mission of the Tellers Committee is to count and certify the results of each election and other membership votes.

PROFESSIONAL DEVELOPMENT GROUPS

Applied Laboratory Methods PDG
The mission of the Applied Laboratory Methods PDG is to provide a forum for the exchange and sharing of information related to the development and use of laboratory methods for the analysis of food and related commodities.
Beverage PDG
The mission of the Beverage PDG is to provide a forum to discuss and develop symposia on issues facing the beverage industry.

Dairy Quality and Safety PDG
The mission of the Dairy Quality and Safety PDG is to promote the production and processing of safe, high quality dairy products and to develop program topics and symposia for presentation at the IAFP Annual Meetings.

Food Chemical Hazards and Food Allergy PDG
The mission of the Food Chemical Hazards and Food Allergy PDG is to facilitate communication on topics in food toxicology including food allergens.

Food Hygiene and Sanitation PDG
The mission of the Food Hygiene and Sanitation PDG is to provide information on the developments in hygiene and sanitation in the food industry.

Food Law PDG
The mission of the Food Law PDG is to provide an international forum for the exchange of information on the scientific issues associated with food laws, regulations and policy.

Food Safety Education PDG
The mission of the Food Safety Education PDG is to provide IAFP members and their clientele information on food safety education.

Fruit and Vegetable Safety and Quality PDG
The mission of the Fruit and Vegetable Safety and Quality PDG is to provide a forum to discuss items of interest to the safe production of fruit and vegetable products and to develop program topics and symposia for presentation at the IAFP Annual Meetings.

International Food Protection Issues PDG
The mission of the International Food Protection Issues PDG is to provide a forum to discuss scientific issues of interest to the international food protection community.

Meat and Poultry Safety and Quality PDG
The mission of the Meat and Poultry Safety and Quality PDG is to provide a forum to discuss items of interest to the safe production of meat and poultry products and to develop program topics and symposia for presentation at the IAFP Annual Meetings.

Microbial Modelling and Risk Analysis PDG
The mission of the Microbial Modelling and Risk Analysis PDG is to facilitate communication on the topic of microbial risk analysis (MRA), promote application and use of MRA and encourage research and data reporting methods that support MRA.

Retail Food Safety and Quality PDG
The mission of the Retail Food Safety and Quality PDG is to provide the retail food safety industry worldwide with information to prepare and serve safe food.

Seafood Safety and Quality PDG
The mission of the Seafood Safety and Quality PDG is to provide a forum to discuss items of interest to the safe production of seafood products and to develop program topics and symposia for presentation at the IAFP Annual Meetings.

Student PDG
The mission of the Student PDG is to provide students of food safety with a platform to enrich their experience as members of IAFP.

Viral and Parasitic Foodborne Disease PDG
The mission of the Viral and Parasitic Foodborne Disease PDG is to promote awareness of non-bacterial causes of foodborne disease by encouraging food safety professionals and others to seek education and training that will enable them to contribute to preventing non-bacterial foodborne infections and outbreaks.

Water Safety and Quality PDG
The mission of the Water Safety and Quality PDG is to provide a forum to discuss items as to the role the safety and quality of water plays globally in the farm-to-table chain and to develop program topics and symposia for presentation at the IAFP Annual Meetings.

TASK FORCE

Rapid Response Series Task Force
The mission of the Rapid Response Series Task Force is to identify developing conditions affecting food safety and organize meetings on these issues to educate IAFP members.

AFFILIATE COUNCIL

The Affiliate Council is an advisory body to the IAFP Board, represents Affiliate Associations' interests, responsible for IAFP Awards Committee, interchanges ideas and recommendations on programs, awards and procedures between Affiliates and the Board.
The China International Food Safety & Quality Conference (CIFSQ) + Expo was held in Beijing, China on September 24 and 25, 2008 with more than 600 attendees.

IAFP is proud to be a supporting partner of this conference and assisted conference organizers by encouraging IAFP Members to participate in the program. In addition, many of IAFP’s industry supporters extended their financial and physical support to this all important conference.

Stan Bailey, IAFP President and David Tharp, Executive Director, met with Ge Zhirong, Chairman of China Entry-Exit Inspection & Quarantine Association (CIQA) to discuss cooperative efforts including establishing a Memorandum of Understanding between the organizations. Both Stan and David had highly visible presentations to attendees which provided direct benefit to publicize IAFP and our activities.

More than 70 presentations over the two-day conference focused on global food safety management systems, innovative technologies, food safety hot topics, novel programs and approaches to food safety, among other topics. A substantial portion of the program content was provided by IAFP Members including Tom Ford, Nancy Eggink, Jeffrey Cawley, Bart Weimer, Leon Gorris, Gary Dykes, T. J. Fu and Gale Prince. Other IAFP Members also participated as speakers or in the exhibit hall. The World Health Organization and the Food and Agriculture Organization were also represented.

There were 37 exhibitors and sponsors for this year's event. Plans are now underway for a third CIFSQ Conference + Expo to be held in September of 2009. IAFP will again be an avid supporter and will continue our work of “Advancing Food Safety Worldwide.”
NEW MEMBERS

CANADA
Sophia Baker-French
University of British Columbia
Vancouver, British Columbia

Tim D. Byrne
Chandler Sales
Moncton, New Brunswick

DENMARK
Nicoline F. Baek
Foss Analytical
Hilleroed

GERMANY
Claudia Wolff
Nestle Product Technology Centre
Singen

ISRAEL
David Rosenblatt
PDCA, Ltd.
Sarigim

Sima Yaron
Technion
Haifa

JAPAN
Hiromi Kubota
Kao Corporation
Haga, Tochigi

MEXICO
Elsy Genny M. Solis
Instituto Tecnologico De Estudios
Superiores De Monterrey
Monterrey, Nuevo Leon

THE NETHERLANDS
Kjeld Bangma
DSM Food Specialties
Delft, Zuid

Erik Van Bommel
PURAC
Gorinchem

Diana Visser
PURAC
Gorinchem

NORWAY
Dag Lillehaug
Elopak AS
Spikkestad, Akershus

PORTUGAL
Fatima Castro
Silliker Portugal S.A.
Canelas, Vila Nova de Gaia

Rui Nogueira
Silliker Portugal S.A.
Canelas, Vila Nova de Gaia

Cristina S. Pintado
Castelo Branco, Beira Baixz

QATAR
Joegi C. Ramos
Hamad Medical Corporation
Doha

SWITZERLAND
Christophe Lacroix
ETH Zurich
Zurich

TURKEY
Zuhal Basaran
Danone Tikvesli Turkiye
Istanbul

Hulya Ibrahim
Ecolab
Istanbul Maltepe

Sebnem S. Karasu
Steamlab
Izmir, Gaziem

UNITED ARAB EMIRATES
Mouza S. Almuhairi
Abu Dhabi Food Control Authority
Al Ain, Abu Dhabi

UNITED KINGDOM
Cheryl M. Mooney
Thermo Fisher-Scientific-Oxoid
Basingstoke, Hampshire

VIETNAM
Long N. Ha
Intertek Testing Service (Vietnam)
Ho Chi Minh

UNITED STATES
CALIFORNIA
Megan Arnold
C.H. Robinson Company
Solvang

Deirdre A. Dillon
Raley’s
Sacramento

Belinda L. Salazar
Golden State Foods
City of Industry

Clement A. Saseun
Golden State Foods
City of Industry
NEW MEMBERS

FLORIDA
Deann Akins
University of Florida
Gainesville

GEORGIA
Brad Collins
Church’s Chicken
Sandy Springs

ILLINOIS
Matthew C. Jenkins
Sodexo
Chicago

LOUISIANA
Sonja T. Jones
Louisiana State University
Baton Rouge
Shuaihua Pu
Louisiana State University
Baton Rouge

MARYLAND
Kristy A. Kubota
Association of Public Health Laboratories
Silver Spring

NEBRASKA
Joseph A. Elrefaie
ConAgra Foods, Inc.
Omaha

NEW JERSEY
Jeffrey Abels
Foreign Trade Service Corp.
Newark

OKLAHOMA
Tam Doan
Bio-Cide International, Inc.
Norman

SOUTH DAKOTA
Phyllis A. Antonacci
AEGIS Food Testing Laboratories
North Sioux City

WASHINGTON
Jon Brandt
Ozone International
Bainbridge Island

NEW GOLD SUSTAINING MEMBERS
This membership was previously a Sustaining Membership

Kellogg Company
Mark A. Moorman
Battle Creek, Michigan

SGS North America
Kevin S. Edwards
Fairfield, New Jersey

NEW SUSTAINING MEMBERS

Lester Schwab Katz & Dwyer, LLP
Paul L. Kassirer
Short Hills, New Jersey

Siemens Building Technologies, Inc.
Philip B. Atteberry
Buffalo Grove, Illinois
ISO Standards Contribute to Meeting World Food Day 2008 Challenge

World Food Day 2008 addresses what has been categorized by many as one of the greatest challenges of our time: climate change and its impact on food security. ISO has an important contribution to make, not only through its numerous International Standards on food related issues, but also through standards that help quantify and mitigate climate change.

World Food Day is organized by the United Nations Food and Agriculture Commission (FAO) each year on the 16 October. The event provides an opportunity to highlight the plight of the 862 million undernourished people in the world — a number that FAO warns could be pushed even higher if the threat of global warming and the consequences of a rising demand for bioenergy are not addressed.

ISO’s portfolio of environmental standards provides practical tools for addressing these issues. Among these are ISO 14001 which has become the global benchmark for environmental management systems, ISO 14064 which gives the requirements for quantifying, monitoring and reporting on greenhouse gas (GHG) emissions and ISO 14065 which specifies accreditation requirements for organizations validating or verifying GHG emission assertions.

ISO Secretary, General Alan Bryden comments: “Climate change mitigation, energy efficiency, water supply and food security are interrelated challenges — all of which ISO addresses through its existing standards and current developments.”

Issues directly related to food are mainly addressed through ISO/TC 34, the ISO technical committee developing standards on food products. The committee currently offers 725 standards and related documents.

Its work covers practically all agricultural products for human consumption and animal feeding stuffs ranging from fruits to cereals to poultry and coffee to name a few. About 65% of its standards concern testing and analytical methods, and are directly targeted at agricultural producers, food manufacturers, laboratories, merchants/retailers, consumers and regulators.

Among ISO developments of recent years relating to the concerns of World Food Day are the following:

- a new subcommittee of ISO/TC 34 to develop standards on the topical subject of biomarkers
- the ISO 22000 series of standards for safe food supply chains, already implemented by an estimated 4,000 organizations in 93 countries at the end of 2007
- standards for the detection of genetically modified organisms and derived products in food
- guidelines for quantitative ingredient declarations to help consumers know what they are eating
- waste reduction by biotechnological methods and enhancement of the conversion of waste materials for the manufacturing of new added value products.

Fifty-four countries participate in the work of ISO/TC 34 and another 52 have observer status. Representatives from these countries came together on 16–17 October, 2008 for a plenary meeting in Paris, France. The event provided an opportunity to discuss current projects and propose new areas of work, as well as addressed organizational and administrative issues.

Other ISO committees develop standards that can contribute to the goals of World Food Day, including ISO/TC 234, a recently formed committee developing standards for sustainable fishing and aquaculture.

ISO has a strong partnership with many United Nations agencies concerned with food issues. They participate as liaison organizations in a number of ISO committees, among them are the World Health Organization (WHO), FAO, and the Codex Alimentarius Commission (CAC).

Another noteworthy example of partnership is that between ISO and the International Dairy Federation (IDF) who work together to prepare and publish analytical methods. Following recent concerns with melamine found in milk products, IDF and ISO are jointly investigating how to tackle this issue through the standards they develop.

New 3-A/ANSI Standard Being Developed for Rubber and Rubber-Like Materials Used in Food and Beverage Equipment

3-A Sanitary Standards, Inc. (3-A SSI) announces the development of a new Standard (to be submitted to the American National Standards Institute (ANSI) as a new American Nation Standard), for Rubber and Rubber-Like Materials Used as Product Contact Surfaces In Equipment. Interested and materially affected parties are invited to participate in the development of this standard. There is no cost to participate.
Materials intended for multiple-use as product or solution contact surfaces of rubber and rubber-like materials standard will cover the processing and handling of food and beverage products. Test procedures and criteria are provided for rubber materials as a means of determining their acceptance as to their ability to be cleaned and to receive effective bactericidal treatment or steam sterilization and to maintain their essential properties in these accelerated use-simulating conditions. This standard does not cover design and fabrication criteria for individual rubber or rubber-like components, because such criteria are provided for in other 3-A Sanitary Standards and 3-A Accepted Practices.

3-A Standard 18-03, bearing the same title, will be used as the starting point for developing this new ANSI/3-A Standard.

Those interested in participating in this activity should contact Nate Wall, 3-A SSI, at nwall@3-a.org or 703.790.0295, ext. 101.

Ethical Naturals Inc.
Commissions New QC and R&D Lab with Renowned Phytochemist

Ethical Naturals Inc., has recently commissioned their new quality control and research and development lab with Dr. Xianguo He as laboratory director.

One of the earliest scientists to develop standardized extracts from botanicals in the US, Dr. He has a strong reputation in the botanical industry for his work in the field of phytochemistry, the chemistry of plants and their metabolic processes.

In 1992, after three years as a visiting professor at the University of Washington, Dr. He began to work as laboratory director for East Earth Herb. His specialty is purification, structural elucidation and biosynthesis of natural products from plants and microorganisms.

Dr. He has authored over 20 peer-reviewed published papers on the subject of plant phytochemistry and analysis. These include an invited 35 page review paper for the Journal of Chromatography on HPLC-MS for studies of botanical extracts, and papers relating to the chemistry of Echinacea, Ginkgo, Kava and several medicinal mushrooms.

Hotel and Restaurant Training Services® Launch Food Handler Online (First Principles)

HRTS, in collaboration with the National Registry of Food Safety Professionals, has just launched Food Handler Online (First Principles) food safety training and certification course which is 100% online. The materials have been developed with an international perspective, including sources in the UK, etc.

People working with food in the US in states such as Florida must be trained in how to prepare, serve and store food safely within 60 days of commencing employment. Many owners and supervisors have been in violation of the states directive and the often used excuse to inspectors from the DBPR is, “I do not have time to train; I have a business to run.” HRTS believes that to allow untrained people to work with food for up to 60 days, or even longer, is to say the least taking a risk with the safety of customers. This online program has bridged that gap in food safety training. Now, anybody who has access to a computer can take a comprehensive training course in food safety (First Principles), and can be tested on their knowledge by answering questions after each section (students are not permitted by the program to move on until they submit the correct answer). At present, the program is available in English and Spanish at www.hrtonline.net. Presented in several sections, it can be completed with or without the pleasant voice-over narrative, and consists of legal responsibilities, personal hygiene, microbiology and illness, potentially hazardous foods, contamination and prevention of illness, time and temperature control, people most at risk from contaminated foods and food spoilage. Each section has a review and questions. Once completed, a confirmation is sent to the student, followed by a laminated wallet card and certificate in approximately seven business days, and is valid for 3 years from the date of completion. National Registry of Food Safety Professionals approved training program is accepted by the DBPR.

BioControl Acquires PickPen Business Unit from BioNobile Oy

BioControl Systems, Inc. has acquired the PickPen® business unit from, BioNobile Oy, located in Turku, Finland. The acquisition encompasses all tangible and intangible assets of the PickPen business including all intellectual property.

The PickPen business centers around a series of devices designed to transfer magnetic particles providing speed and flexibility in a wide variety of biological separation and purification applications. “We immediately recognized the PickPen’s significant advantages in speed, ease of use and improved particle recovery when we incorporated it into the sample preparation procedures for the Assurance GDS® pathogen detection system,” says Phil Feldsine, BioControl Systems CEO. “The acquisition of the PickPen technology is an excellent compliment to our
WHAT'S HAPPENING IN FOOD SAFETY

existing core competencies in the area of rapid antibody and molecular-based diagnostic kit development for the food and beverage industries," explains Mr. Feldsine.

Unlike conventional magnetic purification systems that work by immobilizing the magnetic particles and removing the surrounding liquid, the PickPen removes particles directly from the liquid. The particles can thus be moved rapidly and effortlessly from one stage of the purification to the next. Additionally, introduction of the magnets directly into the sample solution allows for greater particle recovery and improved target isolation.

For more information, visit www.biocontrolsys.com.

New CEO Named at American Dairy Products Institute

The association for manufactured dairy products, American Dairy Products Institute, recently announced the appointment of Dale Kleber as the organization’s new chief executive officer. He assumed the new role on October 27. A proven industry leader, Mr. Kleber will be responsible for guiding ADPI’s executive team and furthering ADPI’s mission.

Mr. Kleber offers ADPI a diverse dairy industry background with more than 20 years of experience in dairy and food-related businesses, including service as a senior executive officer of one of the country’s largest, publicly-traded dairy companies. During the course of his career, he has practiced as a corporate attorney and brings to the position additional expertise in government relations, having served as a senior congressional staff member.

After graduating from Vanderbilt University in 1978 with a degree in business administration, he served as the press secretary and the chief legislative aide, respectively, for two US congressmen. Thereafter, he returned to Vanderbilt and graduated from the School of Law in 1983, while serving on the school’s Law Review.

Beginning his legal career with one of Chicago’s largest law firms, now know as DLA Piper, Mr. Kleber soon moved in-house to work for a publicly-held food manufacturing company. He then joined Dean Foods Company where he worked for fourteen years, holding the position of vice president, secretary and general counsel. He also served on the company’s operating committee while Dean Foods was headquartered in the Chicago area. After the company was acquired, he was a founding member of a dairy cost consulting firm also based in the Chicago area.

FMI CEO Search Committee Announces Selection of Leslie G. Sarasin

The FMI (Food Marketing Institute) CEO Search Committee announced its selection of Leslie G. Sarasin as president and CEO of FMI. Ms. Sarasin was presented to the FMI Board at its October meeting in Boston and started in early November.

Ms. Sarasin has been president and chief executive officer of the American Frozen Food Institute (AFFI) since 1999. She also serves as president of the National Yogurt Association, an association that AFFI manages, and has oversight responsibility for the National Frozen Pizza Institute, Frozen Potato Products Institute, International Frozen Food Association, Texas Mexico Frozen Food Council and Food Processing Environmental Conference. She joined AFFI in 1989.

Previously, she worked as director, government relations, and legal counsel with the National Food Brokers Association and as legal counsel and assistant to the president at Crest International Corporation. Early in her career, she worked for Salomon Brothers Investment Bankers and for Senator Wendell H. Ford.

Ms. Sarasin holds a JD from the University of San Diego and a BA in economics from Smith College. She is a member of the American Bar Association and is admitted to practice law in California and Washington, D.C. She serves on the Board of Directors of the Texas Mexico Frozen Food Council and as chairman of the Food Industry Environmental Council. She also serves on the Boards of Directors of the Produce for Better Health Foundation, the Partnership for Food Safety Education and the National Chamber Foundation. She is a board member and past treasurer of the US Former Members of Congress Auxiliary. Ms. Sarasin also is a member of the US Chamber of Commerce’s Committee of 100.

Previously, Ms. Sarasin served on the Board of Directors of the American Society of Association Executives (ASAE). In 1998, she was awarded ASAE’s Certified Association Executive (CAE) designation and was recertified in 2002 and 2005.

New CEO Named at American Dairy Products Institute

The association for manufactured dairy products, American Dairy Products Institute, recently announced the appointment of Dale Kleber as the organization’s new chief executive officer. He assumed the new role on October 27. A proven industry leader, Mr. Kleber will be responsible for guiding ADPI’s executive team and furthering ADPI’s mission.

Mr. Kleber offers ADPI a diverse dairy industry background with more than 20 years of experience in dairy and food-related businesses, including service as a senior executive officer of one of the country’s largest, publicly-traded dairy companies. During the course of his career, he has practiced as a corporate attorney and brings to the position additional expertise in government relations, having served as a senior congressional staff member.

After graduating from Vanderbilt University in 1978 with a degree in business administration, he served as the press secretary and the chief legislative aide, respectively, for two US congressmen. Thereafter, he returned to Vanderbilt and graduated from the School of Law in 1983, while serving on the school’s Law Review.

Beginning his legal career with one of Chicago’s largest law firms, now know as DLA Piper, Mr. Kleber soon moved in-house to work for a publicly-held food manufacturing company. He then joined Dean Foods Company where he worked for fourteen years, holding the position of vice president, secretary and general counsel. He also served on the company’s operating committee while Dean Foods was headquartered in the Chicago area. After the company was acquired, he was a founding member of a dairy cost consulting firm also based in the Chicago area.

FMI CEO Search Committee Announces Selection of Leslie G. Sarasin

The FMI (Food Marketing Institute) CEO Search Committee announced its selection of Leslie G. Sarasin as president and CEO of FMI. Ms. Sarasin was presented to the FMI Board at its October meeting in Boston and started in early November.

Ms. Sarasin has been president and chief executive officer of the American Frozen Food Institute (AFFI) since 1999. She also serves as president of the National Yogurt Association, an association that AFFI manages, and has oversight responsibility for the National Frozen Pizza Institute, Frozen Potato Products Institute, International Frozen Food Association, Texas Mexico Frozen Food Council and Food Processing Environmental Conference. She joined AFFI in 1989.

Previously, she worked as director, government relations, and legal counsel with the National Food Brokers Association and as legal counsel and assistant to the president at Crest International Corporation. Early in her career, she worked for Salomon Brothers Investment Bankers and for Senator Wendell H. Ford.

Ms. Sarasin holds a JD from the University of San Diego and a BA in economics from Smith College. She is a member of the American Bar Association and is admitted to practice law in California and Washington, D.C. She serves on the Board of Directors of the Texas Mexico Frozen Food Council and as chairman of the Food Industry Environmental Council. She also serves on the Boards of Directors of the Produce for Better Health Foundation, the Partnership for Food Safety Education and the National Chamber Foundation. She is a board member and past treasurer of the US Former Members of Congress Auxiliary. Ms. Sarasin also is a member of the US Chamber of Commerce’s Committee of 100.

Previously, Ms. Sarasin served on the Board of Directors of the American Society of Association Executives (ASAE). In 1998, she was awarded ASAE’s Certified Association Executive (CAE) designation and was recertified in 2002 and 2005.
Sperian Hearing Protection Field Attenuation Study Shows Individual Training Key to Hearing Protector Effectiveness

A recent field attenuation study conducted by the Howard Leight Acoustical Laboratory on the performance of hearing protection devices showed that individual, one-on-one training was the most significant factor in predicting good earplug performance. The study, which was conducted on over 100 workers at eight different facilities, showed that fully one third of workers achieve attenuation higher than published Noise Reduction Ratings (NRR) for their earplugs, and that another third achieve attenuation within 5 dB of those ratings. Only the remaining third had attenuation that was more than 5 dB below published NRRs.

"This reinforces the need for individual fit testing of earplugs, especially in light of the Environmental Protection Agency's proposed labeling changes," said Brad Witt, MA, CCC-A, director of hearing conservation for Sperian hearing protection, LLC, and a principal author of the study. "No generalized rating scheme for hearing protectors can be effective without knowing how much attenuation individual workers actually attain. If a safety manager were to supply earplugs based on the assumption that all earplugs only achieve half of their published NRR in the field, then clearly two-thirds of the workers in this study would be seriously overprotected, since they are achieving much higher protection than 50%.

In this study, workers were tested during their standard work shifts. They were not pre-screened, and were tested with their own earplugs that they routinely wear on the job, with no modifications. The tested earplugs were from four different hearing protection device manufacturers, and workers received no training or coaching as part of the test. The workers were simply asked to insert the earplugs as they normally did on the job. No feedback or correction was offered if they fit the earplug incorrectly.

According to Witt, the purpose of the study was to identify factors which contributed to good earplug fit, and hence, good attenuation in use. "A variety of personal as well as program factors were evaluated to determine which factors would correlate the best to a good earplug fit among these 100 workers," he said. Factors evaluated included: gender, age, years working in a hazardous noise environment, ear canal size, familiarity with hearing protection devices, model of product used, amount of group training received, amount of individual training received and enforcement.

"Of all these factors," said Witt, "only one stood out as having a strong correlation: one-on-one training. That is, the more often a worker had received individual training in the proper use of hearing protectors, the higher the probability of a good fit." The same could not be said for Group Training, according to Witt. "It appeared to make no difference at all whether a worker had attended zero, five or ten group training sessions in hearing protection, when measuring good attenuation in the field."

Enforcement, he added, was also a good predictor of good earplug performance, but only when it was coupled with one-on-one training.

Another question posed by the study was whether workers who achieved low attenuation with one type of earplug would also attain low attenuation with all types of earplugs. "We tested this by inviting some workers to try a second pair of earplugs—different earplugs, perhaps a model they had never tried before," said Witt. Workers who tried a second pair of earplugs often had major leaps in attenuation, bringing them closer to the published NRR.

"Field testing of hearing protectors bridges the gap between the laboratory estimates of attenuation and the real-world attenuation achieved by workers as they normally wear the protectors," Witt concluded. "This test confirmed the value of individual, one-on-one training, and the wisdom of offering workers a variety of suitable hearing protectors."

Sperian Hearing Protection, LLC
800.430.5490
San Diego, CA
www.howardleight.com

Be sure to mention, "I read about it in Food Protection Trends!"

The publishers do not warrant, either expressly or by implication, the factual accuracy of the products or descriptions herein, nor do they so warrant any views or opinions offered by the manufacturer of said articles and products.
World's First Ever Simultaneous Same-Day Dual Test for E. coli O157 and Salmonella Launched by Matrix MicroScience

Matrix MicroScience has announced the launch of its new simultaneous same-day (8 h) dual test for E. coli O157 and Salmonella in raw ground beef and produce.

The Pathatrix® same-day “dual” test is unique in that it can simultaneously detect the presence of low levels (~10 CFU/sample) in eight hours. The high volume of sample that the Pathatrix® can analyze is the key to this approach coupled to the use of highly specific antibody coated beads. Pathatrix® is the only commercially available system that can analyze 100% of the sample!

The benefits of the same-day dual test for E. coli O157 and Salmonella are as follows:

- Uses a single non-proprietary enrichment broth leading to significant savings in labor and media
- Can be completed within 8 hours when coupled to real-time PCR
- Can be done individually or in a “5 Pooled” format
- Sensitivity of 1–10 CFU per sample of both organisms in raw ground beef and raw produce.

For the first time the Pathatrix® dual test can make positive release a realistic option for food processors in the produce and beef industries, by giving a true < 8 hour turnaround in results.

Dr. Adrian Parton, CEO of Matrix MicroScience said, “The release of the dual Salmonella and E. coli O157 test targeted at the raw ground beef and produce industries represents a revolution in microbial diagnostics. It is further evidence of the commitment to our customers and to the industry to provide them with better diagnostic products.”

Matrix MicroScience Ltd.
303.277.9613
Golden, CO
www.matrixmsci.com

New Highly Sensitive AgraQuant® ELISA Test Kit for Dairy Products from Romer Labs

Romer Labs® proudly launches a new, highly sensitive AgraQuant® ELISA test kit that has been designed to meet the coming regulatory limits for melamine in food products.

The European Food Safety Agency (EFSA) and the US Food and Drug Administration (FDA) have both concluded that the level of melamine in food products, other than baby food, should not exceed 2.5 mg/kg. Hong Kong has set its maximum concentration limit for melamine in baby food at 1.0 mg/kg, and 2.5 mg/kg for other foods.

Romer Labs® new AgraQuant® Melamine Sensitive immunoassay has been validated for dairy products such as milk, milk powder, yogurt and yogurt drinks. The test’s quantitation range for milk, yogurt and yogurt drinks is 0.1–5.0 mg/kg, and 0.5–25.0 mg/kg for milk powder.

Melamine, a nitrogen-rich chemical normally used in plastics, has been widely used in China to give livestock feed the appearance of higher protein content. Most recently involved in the deaths of at least 3 and illnesses of more than 6,200 babies in China when illegally used to disguise the protein content in baby milk formulas, melamine first made the headlines last year when it was found as an additive in the pet food that caused the deaths of dogs and cats in the US. Melamine by itself is nontoxic in low doses, but when combined with cyanuric acid it can cause fatal kidney stones.

Romer Labs® Group
636.583.8600
Union, MO
www.romerlabs.com

Vacci-Test Demonstrates the First Same-Shift Test for E. coli O157:H7

With food safety top of mind for consumers and the food industry, Vacci-Test Corporation (“Vacci-Test”) is pleased to announce that its first food safety test, FoodChek™-E. coli, has successfully completed a field trial at a major meat packaging facility and has shown that it can accurately test for E. coli O157:H7 in less than 6 hours, including enrichment. FoodChek™-E. coli is a revolutionary new same-shift test that is rapid, accurate and cost effective. FoodChek™-E. coli is a breakthrough solution for meat-processors enabling them to deliver high quality and safe products to consumers.

FoodChek™-E. coli uses magnetic nanotechnology and a proprietary, inexpensive and easy-to-use magnetic reader that provides a very sensitive, specific and quantitative test result.

The field trial was conducted at Vantage Foods Inc., a leading processor of retail ready fresh meats, at their facility in Chilliwack, British Columbia. Mr. Gary Haley, president and CEO of Vantage Foods stated, “We are pleased to have been able to work with Vacci-Test in field test-
Vantage Foods prides itself on using leading edge technology such as FoodChek™-E. coli to compliment our best business practices philosophy of distributing the highest quality and safest products to our customers. 

Sandy MacPherson, chairman of the executive operating committee of Vacci-Test, stated "Our FoodChek™-E. coli test will have a major impact for both regulatory agencies and meat-processors. Potential food contaminants such as E. coli O157:H7 can now be tested on site and identified prior to the end of a production shift. FoodChek™-E. coli eliminates the need for slaughterhouses and meat-processors to hold finished products in cold storage until testing can be completed by off-site third parties."

Eriez® Rota-Grates® feature a unique rotating design to remove both large and small ferrous contaminants that tend to stick, clog and bridge when passed through flat grate magnets. Rota-Grates provide exceptional efficiency on many finely ground cohesive materials such as gypsum, barium carbonate, Fuller's earth, lime, cohesive chemicals, confectionary sugar, cornstarch, cocoa, flour, wood flour and fibrous materials.

Eriez Rota-Grates feature a rugged structure including magnetic elements that are completely encased and fastened to stainless steel end plates. The durable units are equipped with steel shaft and hubs to ensure many years of service.

Rota-Grates are offered in 24 sizes, including multiple lengths and widths. Standard units allow simple manual cleaning, but a self-cleaning Rota-Grate model is available for applications where routine cleaning is problematic. Rota-Grates in housing are ideal for dusty installations where an enclosed unit is necessary. Optional features include adapters to transition the product flow into grate housing, removable tube assemblies for easy cleaning and explosion-proof drives for hazardous operations.

BFM™ Fitting Distributed by Powder-Solutions, Inc. Helps Reduce Risks of Bulk Powder Processing Plant Explosions

Over the past 30 years, more than 300 dust explosions have killed more than 120 workers in grain silos, sugar plants, and food processing plants. In 2008, after a catastrophic dust explosion in a Georgia sugar factory, the US House of Representatives passed a bill requiring the Occupational Safety and Hazards Administration (OSHA) to set standards for regulating combustible dusts.

All this has been carefully observed by Marv Deam, CEO of Powder-Solutions, Inc., and he believes his company has a worthwhile product to offer any industry dealing with production of bulk powders, dusts, or granular products. "Now more than ever, it is imperative that bulk powder processing plants are prepared with equipment that not only is efficient during processing, but also protects from the possibility of plant explosions," states Mr. Deam. "Sophisticated explosion venting and suppression systems can only be successful if the primary explosion is contained within the process equipment. Independent lab tests have confirmed that whereas the hose clamp is likely to release in the event of an internal explosion, the BFM™ fitting distends with the sudden pressure shock, but it does not fail."

Available from Powder-Solutions since 2007, the BFM fitting was initially designed for food and pharmaceutical production facilities to stop powder leakage from process piping. "We see now that there are opportunities in disparate industries, where the inherent design of the BFM™ fitting has great potential to increase safety in a wide variety of industrial applications."

The BFM™ fitting system represents a new paradigm in flexible
connectors. Instead of slipping over the outside of process piping or connections, the BFM sleeve snaps securely and perfectly into the inside of the matched spigots. Where old style connectors required the use of a hose clamp with all its inherent flaws, the BFM™ fitting simply snaps into place without the use of external clamps or the tools needed to secure them. There are no crevices to trap powder in the line and no cracks to leak powder to atmosphere. There are no wear points to abrade and degrade that could rupture in the event of an internal explosion. By virtue of the integral internal snap band seals, the BFM™ fitting actually seals even tighter in such events.

"Unique in its resistance to over pressure incidents, the BFM™ fitting is not only an efficient connective solution, it is a significant safety measure," continues Mr. Deam. "From industries as varied as dairy and food to pharmaceutical and chemical to wood production, the BFM™ fitting is an effective tool in an overall explosion mitigation strategy."

Powder Solutions, Inc.
877.236.3539
Chanhassen, MN
www.powder-solutions.com

Techno-Sommer’s New Specialized Gripper Expands Product Line into “Food-Handling” Business

The newest edition to the Techno-Sommer Automatic product line is the GGL3060 “Food” gripper. Designed specifically for food-handling applications the GGL3060 is sealed according to IP69K standards, allowing it to withstand both high-pressure and high-temperature (wash down) cleanings. The Techno GGL3060 gripper has a compact form with a matching corrosion-resistant, stainless steel design. It also meets DIN 1672-2 guidelines for hygienic food production machinery, making it food safe.

This specialized gripper features jaws that swing open to a full 180°. This makes it very easy to have the gripper clear material below it. Additionally, the angular design of this gripper provides up to 33Nm (24 lb ft) of gripping torque and the unit includes sensors that sense jaw position.

Techno-Sommer
800.819.3366
New Hyde Park, NY
www.techno-sommer.com

Cygnus Mfg. Co. Signs Agreement with Hanson Technologies to Build OmniFresh 1000™ Food Contaminant Screening System

Cygnus Manufacturing Company, a contract manufacturer of products and components used in health and safety, medical, scientific, transportation, aerospace and energy applications, has partnered with Hanson Technologies (Carlisle, PA), a food safety technology company, to fabricate the automated OmniFresh 1000™ System. OmniFresh 1000™ screens large-volume fresh produce lots in near-real time for contamination by E. coli, Salmonella and other bacteria. It provides test results in two hours or less, compared to 12–36 hours for conventional lab testing methods that sample only a tiny percentage of produce lots. The OmniFresh 1000™ System represents a significant improvement in pathogen screening, identifying 99%+ of harmful pathogens vs. 5.8% using conventional testing methods.

According to the US Food and Drug Administration, more than 5,000 people in the United States die each year from diseases caused by eating contaminated food. The economic cost of those incidents is more than $10 billion annually.

OmniFresh 1000™ may be installed “on-line” with standard processing equipment and can be customized to meet the specific needs of food growers, processors, distributors and retailers. The system has been pilot tested at fresh produce production facilities in Pennsylvania and California. Hanson will begin delivering the OmniFresh 1000™ to customers this fall. The OmniFresh 1000™ System is beneficial to food growers, processors, distributors and retailers because it enables them to: protect their brands by delivering superior products; reduce overhead costs by lowering the probability of pathogen-related outbreaks, and subsequent recalls and legal actions; improve quality control, including lot traceability; and maximize product freshness and shelf life.

Hanson Technologies
717.245.9890
Saxonburg, PA
www.hansontechnologies.com

Be sure to mention, “I read about it in Food Protection Trends”!!
COMING EVENTS

JANUARY
• 4-10, Ice Cream Short Course. Penn State University, University Park, PA. For more information, call 814.865.8237, or go to http://conferences.cas.psu.edu/.
• 22-23, An International Meeting on Cronobacter (Enterobacter sakazakii), O'Reilly Hall, University of Dublin, Ireland. For more information, go to www.ucd.ie/crono09.

FEBRUARY
• 25-28, NMC 48th Annual Meeting, Westin Hotel, Charlotte, NC. For more information, go to www.nmconline.org/meetings.html.

MARCH
• 2-3, 9th Annual ASQ Lean Six Sigma Conference, Phoenix, AZ. For more information, call 800.248.1946 or go to www.asq.org.

APRIL

MAY
• 4-6, Food Marketing Institute Future Connect Conference, Hyatt Regency, Dallas, TX. For more information, go to www.fmifutureconnect.com.
• 6, Metropolitan Association for Food Protection Spring Seminar, Rutgers University, Cook College Campus Center, New Brunswick, NJ. For more information, contact Carol Schwarz at 908.475.7960; E-mail: cschwar@co.warren.nj.us or visit www.metrofoodprotection.org.

FEBRUARY
• 3-4, Industrial Cheese Making Workshop, University of Idaho, Food Science and Toxicology Dept., Twin Falls, ID. For more information, contact Paula Peterman at 208.364.6188; E-mail: paulap@uidaho.edu.
• 4-6, CIES International Food Safety Conference, Barcelona, Spain. For more information, contact Marjo Jarvinen at 331.44.69.84.82 or go to www.ciesfoodsafety.com.
• 9-12, Dairy Technology Workshop, Birmingham, AL. For more information, contact Randolph Associates, Inc. at 205.595.6455; E-mail: henry.randolph@raiconsult.com.

JULY 12-15, 2009
Grapevine, Texas

AUGUST 1-4, 2010
Anaheim, California
The index and/or has been removed and graphed separately in the volume year.

For roll film users, for the current volume the beginning of the prior year volume is at the end of the.

For microfiche users and/or contents in separate fiches.
or table of contents

oved and photo-
lately within this

ers, this information
volume year is at the
microfilm. For a
this information
the microfilm.

ers, the index
is contained on a
INTERNATIONAL ASSOCIATION
FOR FOOD PROTECTION

General Fund Statement of Activity
For the Year Ended August 31, 2008

Revenue:
Advertiseing .............................. $149,001
Membership & Administration ........ 374,969
Communication .......................... 745,058
Annual Meeting ........................... 906,891
Workshops & Symposia .................. 78,175
International Symposia ................. 120,272
Total revenue ............................ $2,374,366

Expense:
Advertiseing ................................ 113,412
Membership & Administration .......... 798,004
Communication ........................... 765,049
Annual Meeting ........................... 620,487
Workshops & Symposia ................. 36,553
International Symposia ................. 132,698
Total expense ............................ $2,466,203

Change in General Fund ........................ $(91,837)

Net Assets as of 8/31/08:
General Fund .............................. 668,637
Foundation Fund .......................... 726,631
Restricted Fund ........................... 34,745
Speaker Travel Fund ....................... 113,561
Total net assets ........................... $1,543,574

Identification of Food-Spoilage Mold Workshop
January 28-30, 2009
San Francisco Bay Area

Taught by a PhD mycologist and an industry expert, this workshop can help you
- Identify mold contamination
- Save time and lab testing fees
- Exercise better quality control
- Protect your business reputation

To learn more, visit www.aemtek.com or call us at 510-979-1979

Search, Order, Download
3-A Sanitary Standards
Get the latest 3-A Sanitary Standards and 3-A Accepted Practices and see how the 3-A Symbol program benefits equipment manufacturers, food and dairy processors and product sanitarians.

Order online at www.3-a.org
BOOKLET ORDER FORM

SHIP TO:
Member # __________________________
First Name ___________________ M.I. _______ Last Name _________________________
Company ________________________ Job Title ______________________________
Mailing Address __________________________________________________________
Please specify: ☐ Home ☐ Work
City ___________________ State or Province ________________________________
Postal Code/Zip + 4 _______ Country _____________________________
Telephone # _______ Fax # ____________
E-Mail __________________________

BOOKLETS:

<table>
<thead>
<tr>
<th>QUANTITY</th>
<th>DESCRIPTION</th>
<th>MEMBER OR GOV'T PRICE</th>
<th>NON-MEMBER PRICE</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Procedures to Investigate Waterborne Illness—2nd Edition</td>
<td>$12.00</td>
<td>$24.00</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Procedures to Investigate Foodborne Illness—5th Edition</td>
<td>12.00</td>
<td>24.00</td>
<td></td>
</tr>
</tbody>
</table>

SHIPPING AND HANDLING — $3.00 (US) $5.00 (Outside US)

Multiple copies available at reduced prices.
Phone our office for pricing information on quantities of 25 or more.

OTHER PUBLICATIONS:

<table>
<thead>
<tr>
<th>QUANTITY</th>
<th>DESCRIPTION</th>
<th>MEMBER OR GOV'T PRICE</th>
<th>NON-MEMBER PRICE</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>*JFP Memory Stick – September 1952 through December 2000</td>
<td>$295.00</td>
<td>$325.00</td>
<td></td>
</tr>
<tr>
<td></td>
<td>*International Food Safety Icons and International Food Allergen Icons CD</td>
<td>25.00</td>
<td>25.00</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Pocket Guide to Dairy Sanitation (minimum order of 10)</td>
<td>75</td>
<td>1.50</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Before Disaster Strikes…A Guide to Food Safety in the Home (minimum order of 10)</td>
<td>75</td>
<td>1.50</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Before Disaster Strikes…Spanish language version – (minimum order of 10)</td>
<td>75</td>
<td>1.50</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Food Safety at Temporary Events (minimum order of 10)</td>
<td>75</td>
<td>1.50</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Food Safety at Temporary Events – Spanish language version – (minimum order of 10)</td>
<td>75</td>
<td>1.50</td>
<td></td>
</tr>
<tr>
<td></td>
<td>*Annual Meeting Abstract Book Supplement (year requested)</td>
<td>25.00</td>
<td>25.00</td>
<td></td>
</tr>
<tr>
<td></td>
<td>*IAFP History 1911-2000</td>
<td>25.00</td>
<td>25.00</td>
<td></td>
</tr>
</tbody>
</table>

SHIPPING AND HANDLING — per 10 — $2.50 (US) $3.50 (Outside US)

Other Publications Total

PAYMENT:

Payment must be enclosed for order to be processed • US FUNDS on US BANK

☐ Check Enclosed ☐ Visa ☐ Mastercard ☐ American Express ☐ Discover

CREDIT CARD # __________________________
CARD ID # ___________________ EXP. DATE ____________
SIGNATURE __________________________

*Visa, Mastercard and Discover: See 3-digit Card ID number on the back of the card after account number.
American Express: See 4-digit, non-embossed number printed above your account number on the face of your card.

INTERNATIONAL ASSOCIATION FOR FOOD PROTECTION

4 EASY WAYS TO ORDER

PHONE 800.369.6337; 515.276.3344
FAX 515.276.8655
MAIL 6200 Aurora Ave., Suite 200W Des Moines, IA 50322-2864, USA
WEB SITE www.foodprotection.org

DECEMBER 2008 | FOOD PROTECTION TRENDS 959
MEMBERSHIP APPLICATION

Prefix (Prof. Dr. Mr. Ms.)

First Name __________________ M.I. __________________ Last Name __________________

Company ___________________ Job Title __________________

Mailing Address ______________________________

Please specify: [ ] Home [ ] Work

City __________________ State or Province __________________

Postal Code/Zip + 4 __________________ Country __________________

Telephone # __________________ Fax # __________________

E-Mail __________________

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

MEMBERSHIPS

<table>
<thead>
<tr>
<th>Membership Type</th>
<th>US</th>
<th>Canada/Mexico</th>
<th>International</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>IAFP Membership</strong></td>
<td>$50.00</td>
<td>$50.00</td>
<td>$50.00</td>
</tr>
<tr>
<td>Optional Benefits:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>[ ] Food Protection Trends</td>
<td>Add $60.00</td>
<td>$75.00</td>
<td>$90.00</td>
</tr>
<tr>
<td>[ ] Journal of Food Protection</td>
<td>Add $150.00</td>
<td>$170.00</td>
<td>$200.00</td>
</tr>
<tr>
<td>[ ] Journal of Food Protection Online</td>
<td>Add $36.00</td>
<td>$36.00</td>
<td>$36.00</td>
</tr>
<tr>
<td>[ ] All Optional Benefits – BEST VALUE!</td>
<td>Add $200.00</td>
<td>$235.00</td>
<td>$280.00</td>
</tr>
<tr>
<td><strong>Student Membership</strong></td>
<td>$25.00</td>
<td>$25.00</td>
<td>$25.00</td>
</tr>
<tr>
<td>Optional Benefits:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>[ ] Student Membership with FPT</td>
<td>Add $30.00</td>
<td>$45.00</td>
<td>$60.00</td>
</tr>
<tr>
<td>[ ] Student Membership with JFP</td>
<td>Add $75.00</td>
<td>$95.00</td>
<td>$125.00</td>
</tr>
<tr>
<td>[ ] Student Membership with JFP Online</td>
<td>Add $18.00</td>
<td>$18.00</td>
<td>$18.00</td>
</tr>
<tr>
<td>[ ] All Optional Benefits – BEST VALUE!</td>
<td>Add $100.00</td>
<td>$135.00</td>
<td>$180.00</td>
</tr>
</tbody>
</table>

SUSTAINING MEMBERSHIPS

<table>
<thead>
<tr>
<th>Membership Type</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>GOLD</strong></td>
<td>$5,000.00</td>
</tr>
<tr>
<td><strong>SILVER</strong></td>
<td>$2,500.00</td>
</tr>
<tr>
<td><strong>SUSTAINING</strong></td>
<td>$750.00</td>
</tr>
</tbody>
</table>

Contact the IAFP office for more information on the Sustaining Membership Program.

Payment must be enclosed in order to be processed – US FUNDS on US BANK

<table>
<thead>
<tr>
<th>Payment Method</th>
<th>Check Enclosed</th>
<th>Visa</th>
<th>Mastercard</th>
<th>American Express</th>
<th>Discover</th>
<th>TOTAL MEMBERSHIP PAYMENT $</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>[ ]</td>
<td>[ ]</td>
<td>[ ]</td>
<td>[ ]</td>
<td>[ ]</td>
<td>All prices include shipping and handling</td>
</tr>
</tbody>
</table>

Prices effective through August 31, 2009

4 EASY WAYS TO JOIN

PHONE | FAX | MAIL | WEB SITE
--- | --- | --- | ---
800.369.6337; 515.276.3344 | 515.276.8655 | 6200 Aurora Ave., Suite 200W | www.foodprotection.org

DECEMBER 2008
JULY 12-15, 2009
GAYLORD TEXAN RESORT
GRAPEVINE, TEXAS
CURRENT PCR USER?
OR WANT TO BE A PCR USER?
YOU CAN SAVE 60% OF COSTS IMMEDIATELY!

If you’re an existing user of PCR or want to be, but just cannot afford it, Matrix has developed the perfect solution for you. The PATHATRIX - ULTRA system is widely used and approved by multi-national companies.

Using the AOAC approved Pooling Strategy that Matrix has developed you can save up to 60% of your PCR testing costs without compromising sensitivity at all!

In fact many customers have reported the elimination of “false positives” and increased specificity and sensitivity.

We have customers using a wide variety of PCR systems from all of the major manufacturers and have successfully delivered the benefits of PATHATRIX Pooling to all of them.

If you want to know more...
Contact us at:
sales@matrixmsci.com
US Tel: 303 277 9613
UK Tel: +44 1638 723110
www.matrixmsci.com