VOL. 23, NO. 9
ISSN: 1541-9576
PERIODICALS
6200 Aurora Avenue•Suite 200W
Des Moines, Iowa•USA•50322-2864

FOOD PROTECTION TRENDS

SCIENCE AND NEWS FROM THE INTERNATIONAL ASSOCIATION FOR FOOD PROTECTION

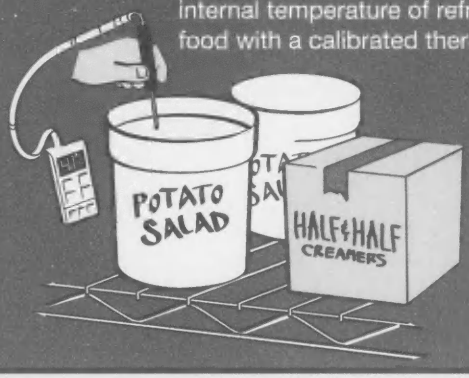
SEPTEMBER 2003

www.foodprotection.org

Store it. Don't ignore it.

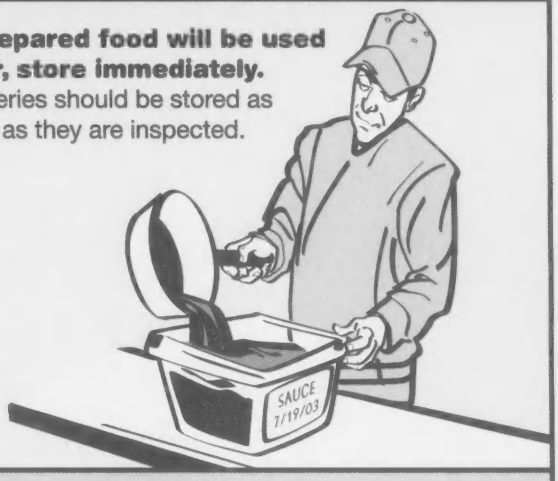
Store raw meat, poultry and fish separately from prepared and ready-to-eat food. If these items can't be stored separately, store them below prepared or ready-to-eat food as shown.

Check temperatures of stored food and storage areas regularly. Randomly sample the internal temperature of refrigerated food with a calibrated thermometer.



Follow the first in, first out (FIFO) method of stock rotation when storing food. Shelve food based upon its use-by or expiration date. Store products with the earliest dates in front of products with later dates, so older food is used first.

If prepared food will be used later, store immediately. Deliveries should be stored as soon as they are inspected.



Store foods at the proper temperature. Fresh meat, poultry and fish should be stored at an internal temperature of 41°F (5°C) or lower.

nfsem℠

National Food Safety Education Month

September 2003

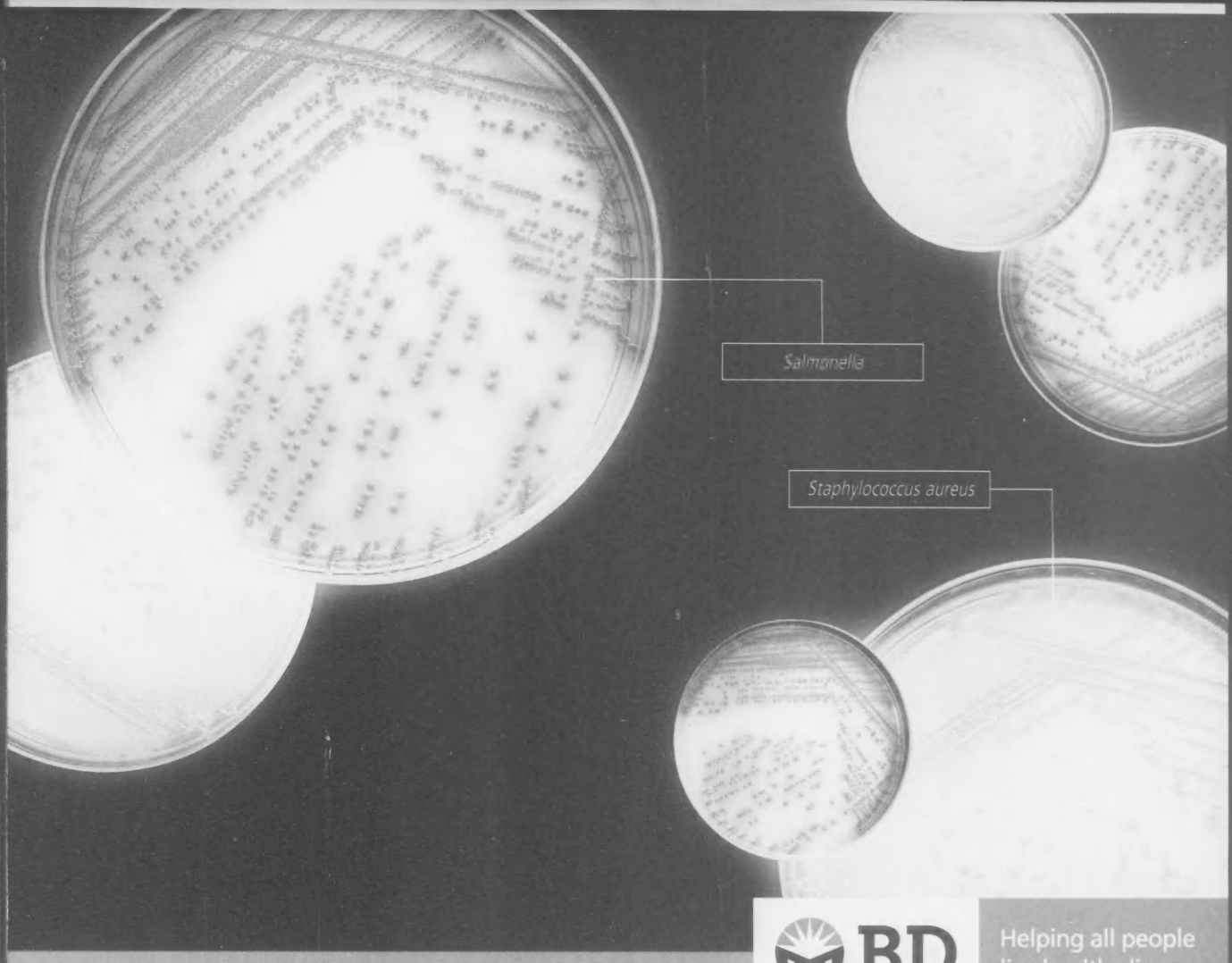
For more information, visit the Web site at **www.nraef.org/nfsem**, or call 312.715.1010, ext. 712

FOOD SAFETY COUNCIL

National Restaurant Association EDUCATIONAL FOUNDATION

Founding Sponsors

Campaign Sponsors



BD

Helping all people live healthy lives

Staph and Salmonella Never Looked So Good!

See *Staphylococcus* and *Salmonella* in living color with BBL™ CHROMagar™ plated media products. Now you can enhance your food testing protocol for faster, more accurate and cost-effective testing of food pathogens. And it's all done with advanced chromogenic media formulations that reveal colonies of food pathogens in distinctive, identifiable colors! The latest additions to the BD line of chromogenic media allow you to isolate and detect *Staphylococcus aureus* and *Salmonella* in food products.

For information on BBL™ CHROMagar™ Staph aureus and BBL™ CHROMagar™ Salmonella, contact your local BD representative, or call 800.638.8663.

BD Diagnostic Systems
7 Loveton Circle
Sparks, MD 21152-0999 USA
800.638.8663
www.bd.com/industrial

Reader Service No. 162

ABOUT THE COVER...

Photo courtesy of Photo Disc, *The Painted Table Signature, Series 4.*

Use of this photo does not imply endorsement of any product by the International Association for Food Protection.

International Association for Food Protection

FOOD PROTECTION TRENDS

VOLUME 23, NO. 9

ARTICLES

ASSOCIATION NEWS

DEPARTMENTS

EXTRAS

Dr. Harry Haverland
1926 – 2003

It is with sorrow that we report the death of Dr. Harry Haverland, long-time leader of the International Association for Food Protection and its predecessor, the International Association of Milk, Food and Environmental Sanitarians.

Dr. Haverland began his six-year term of service on the Board of Directors of this organization in 1978. He served as President from 1981 to 1982. Soon after he completed service on the Board in 1984 Harry was appointed to the Foundation Fund Committee and served as its Chair for many years until his death in June 2003. Under his leadership, the Ivan Parkin Lecture and the Developing Scientists Awards were established in 1986, and the Audiovisual Library was started in 1987. He was a strong supporter and contributor to the silent auctions held to increase the endowment of the Foundation Fund.

Harry's education included a Master of Public Health from the University of Minnesota and a Ph.D. from the University of Cincinnati. His career included service in the US Navy during World War II, six years at a local health department in Hamilton, OH and 35 years as a commissioned officer in the US Public Health Service. He served the USFDA in Dallas, Boston, Washington, D.C. and Cincinnati. His several positions included being Director or Chief of State Training, Milk and Food Sanitation, Interstate Travel Sanitation, and Food Hazard Surveillance. The US Public Health Service recognized Dr. Haverland with its Medal of Commendation and its Distinguished Service Award.

After retirement, Harry consulted for the Food and Agriculture Organization of the United Nations from 1985 to 1993. It was in this role that he learned of the opportunity to ship excess copies of the *Journal of Food Protection* and *Food Protection Trends* to UN headquarters in Rome where they are forwarded by FAO to developing countries for use by persons who have no resources to obtain them. The Foundation Fund continues to support those mailings annually. IAFP recognized Harry in 1985 with its Sanitarian Award, in 1992 by granting Honorary Life Membership status and again in 1998 by inducting him into the first class of IAFP Fellows. In 1997, the Association honored Harry by naming the prestigious Citation Award in his name. The Award is now known as the Harry Haverland Citation Award. He cooperated in 2000 with Earl Wright in writing the history of IAFP. In his community he served on the Board of Health.

Chief among Harry Haverland's attributes were his active love for Helen, his wife; Alice and Kathy, his daughters, and his two grandchildren. Each has attended most of the meetings of IAFP for many years. His life was a testimony to his strong faith in his Maker who he served in his church and especially through the St. Vincent de Paul Society that he assisted for 35 years in providing food and services to families in need.

The International Association for Food Protection dedicated the 2003 meeting in honor of this outstanding servant of the organization and of mankind.

Submitted by,

Robert T. Marshall

International Association for Food Protection®
6200 Aurora Avenue, Suite 200W
Des Moines, IA 50322-2864, USA
Phone: 800.369.6337 • 515.276.3344
Fax: 515.276.8655
E-mail: info@foodprotection.org
Web site: www.foodprotection.org

FOOD PROTECTION TRENDS
SCIENCE AND NEWS
FROM THE INTERNATIONAL ASSOCIATION FOR FOOD PROTECTION

Food Protection Trends (ISSN-1541-9576) is published monthly beginning with the January number by the International Association for Food Protection, 6200 Aurora Avenue, Suite 200W, Des Moines, Iowa 50322-2864, USA. Each volume comprises 12 numbers. Printed by Heuss Printing, Inc., 911 N. Second Street, Ames, Iowa 50010, USA. Periodical Postage paid at Des Moines, Iowa 50318 and additional entry offices.

Manuscripts: Correspondence regarding manuscripts should be addressed to Donna A. Bahun, Production Editor, International Association for Food Protection.

News Releases, Updates, Coming Events and Cover Photos: Correspondence for these materials should be sent to Donna A. Bahun, Production Editor, International Association for Food Protection.

"Instructions for Authors" may be obtained from our Web site at www.foodprotection.org or from Donna A. Bahun, Production Editor, International Association for Food Protection.

Orders for Reprints: All orders should be sent to *Food Protection Trends*, International Association for Food Protection. Note: Single copies of reprints are not available from this address; address single copy reprint requests to principal author.

Reprint Permission: Questions regarding permission to reprint any portion of ***Food Protection Trends*** should be addressed to: Donna A. Bahun, Production Editor, International Association for Food Protection.

Business Matters: Correspondence regarding business matters should be addressed to Lisa K. Hovey, Managing Editor, International Association for Food Protection.

Membership Dues: Membership in the Association is available to individuals. Dues include a 12-month subscription to ***Food Protection Trends*** at a rate of $95.00 US, $110.00 Canada/Mexico, and $125.00 International. Dues including ***Food Protection Trends*** and the ***Journal of Food Protection*** are $165.00 US, $200.00 Canada/Mexico, and $245.00 International. Student memberships are available with verification of student status. Student rates are $47.50 US, $62.50 Canada/Mexico, and $77.50 International for ***Food Protection Trends***; $47.50 US, $67.50 Canada/Mexico, and $97.50 International for ***Journal of Food Protection***; and $82.50 US, $117.50 Canada/Mexico, and $162.50 International for ***Food Protection Trends*** and ***Journal of Food Protection***. All membership dues include shipping and handling. No cancellations accepted. Correspondence regarding changes of address and dues must be sent to Julie A. Cattanach, Membership Services, International Association for Food Protection.

Sustaining Membership: Three levels of sustaining membership are available to organizations. For more information, contact Julie A. Cattanach, Membership Services, International Association for Food Protection.

Subscription Rates: ***Food Protection Trends*** is available by subscription for $220.00 US, $235.00 Canada/Mexico, and $250.00 International. Single issues are available for $26.00 US and $35.00 all other countries. All rates include shipping and handling. No cancellations accepted. For more information contact Julie A. Cattanach, Membership Services, International Association for Food Protection.

Claims: Notice of failure to receive copies must be reported within 30 days domestic, 90 days outside US.

Postmaster: Send address changes to ***Food Protection Trends,*** 6200 Aurora Avenue, Suite 200W, Des Moines, Iowa 50322-2864, USA.

Food Protection Trends is printed on paper that meets the requirements of ANSI/NISO 239.48-1992.

Future Annual Meetings

IAFP 2004

AUGUST 8-11

JW Marriott Desert
Ridge Resort
Phoenix, Arizona

IAFP 2005

AUGUST 14-17

Baltimore Marriott
Waterfront Hotel
Baltimore, Maryland

IAFP 2006

AUGUST 13-16

Telus Convention Centre
Calgary, Alberta, Canada

International Association for Food Protection

FOOD PROTECTION TRENDS

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

Associations Make A Better World

FPT EDITORIAL BOARD

SUSTAINING MEMBERS

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 that might not otherwise be possible. Organizations who lead the way in new technology and development join IAFP as Sustaining Members.

GOLD

DuPont Qualicon
Wilmington, DE
302.695.5300

Kraft Foods North America
Glenview, IL
847.646.3678

SILVER

bioMérieux, Inc.
Hazelwood, MO
800.638.4835

F & H Food Equipment Co.
Springfield, MO
417.881.6114

MATRIX MicroScience, Inc.
Golden, CO
303.277.9613

Orkin Commercial Services
Atlanta, GA
404.888.2241

Quality Flow Inc.
Northbrook, IL
847.291.7674

Silliker Inc.
Homewood, IL
708.957.7878

Weber Scientific
Hamilton, NJ
609.584.7677

SUSTAINING MEMBERS

SUSTAINING

3-A Symbol Council, Lawrenceville, GA; 770.554.8923

3M Microbiology Products, St. Paul, MN; 612.733.9558

ABC Research Corporation, Gainesville, FL; 352.372.0436

ASI Food Safety Consultants, Inc., St. Louis, MO; 800.477.0778

BD Diagnostic Systems, Sparks, MD; 410.316.4467

Bentley Instruments, Inc., Chaska, MN; 952.448.7600

BioControl Systems, Inc., Bellevue, WA; 425.603.1123

Biolog, Inc., Hayward, CA; 510.785.2564

Bio-Rad Laboratories, Hercules, CA; 510.741.5653

Birds Eye Foods, Inc., Green Bay, WI; 920.435.5301

Capitol Vial, Inc., Tucson, AZ; 800.688.9515

Capitol Wholesale Meats, Chicago, IL; 773.890.0600

DARDEN Restaurants, Inc., Orlando, FL; 407.245.5330

Decagon Devices, Inc., Pullman, WA; 509.332.2756

Deibel Laboratories, Inc., Lincolnwood, IL; 847.329.9900

DonLevy & Associates, Inc., Merrillville, IN; 219.736.0472

Dynal Biotech, Inc., Lafayette Hill, PA; 866.DYNALTT

DSM Food Specialties, Menomonee Falls, WI; 262.255.7955

DQCI Services, Inc., Mounds View, MN; 763.785.0484

EMD Chemicals Inc., Gibbstown, NJ; 856.423.6300

Ecolab, Inc., St. Paul, MN; 612.293.2364

Electrol Specialties Co., South Beloit, IL; 815.389.2359

Evergreen Packaging, Division of International Paper, Cedar Rapids, IA; 319.399.3236

FoodHandler, Inc., Westbury, NY; 800.338.4433

Food Processors Institute, Washington, D.C.; 800.355.0983

Food Safety Net Services, Ltd., San Antonio, TX; 210.384.3424

Foss North America, Inc., Eden Prairie, MN; 952.974.9892

Georgia-Pacific Technology Center, Palatka, FL; 386.312.1184

IBA, Inc., Millbury, MA; 508.865.6911

International BioProducts, Inc., Bothell, WA; 425.398.7993

International Dairy Foods Association, Washington, D.C.; 202.737.4332

International Fresh-cut Produce Association, Alexandria, VA; 703.299.6282

Iowa State University Food Microbiology Group, Ames, IA; 515.294.4733

JohnsonDiversey, Sharonville, OH; 513.956.4889

Michelson Laboratories, Inc., Commerce, CA; 562.928.0553

Medical Wire & Equipment Co., 44.1225.810361

Nasco International, Inc., Fort Atkinson, WI; 920.568.5536

The National Food Laboratory, Inc., Dublin, CA; 925.828.1440

National Food Processors Association, Washington, D.C.; 202.639.5985

Nelson-Jameson, Inc., Marshfield, WI; 715.387.1151

Neogen Corporation, Lansing, MI; 517.372.9200

Nestlé USA, Inc., Glendale, CA; 818.549.5799

NSF International, Ann Arbor, MI; 734.769.8010

Oxoid, Inc., Nepean, Ontario, Canada; 800.267.6391

Penn State University, University Park, PA; 814.865.7535

The Procter & Gamble Co., Cincinnati, OH; 513.983.8349

Purification Research Technologies Inc., Guelph, Ontario, Canada, 519.766.4169

REMEL, Inc., Lenexa, KS; 800.255.6730

Rhodia Inc., Madison, WI; 800.356.9393

Ross Products, Columbus, OH; 614.624.7040

rtech™ laboratories, St. Paul, MN; 800.328.9687

Seiberling Associates, Inc., Dublin, OH; 614.764.2817

Strategic Diagnostics Inc., Newark, DE; 302.456.6789

United Fresh Fruit & Vegetable Association, Alexandria, VA; 703.836.3410

Warren Analytical Laboratory, Greeley, CO; 800.945.6669

West Agro, Inc., Kansas City, MO; 816.891.1558

WestFarm Foods, Seattle, WA; 206.286.6772

Zep Manufacturing Company, Atlanta, GA; 404.352.1680

"PRESIDENT'S" PERSPECTIVE

By PAUL HALL
PRESIDENT

"Sacred Responsibility"

This is my first column as President of your Association. Again, I want to thank you, the members of IAFP, for electing me to the Executive Board four years ago. It is an honor and privilege to serve you in this manner. I want to extend my appreciation to the other members of your Executive Board – Affiliate Council Chairperson – Gene Frey, Secretary – Frank Yiannis, Vice President – Jeff Farber, President-Elect – Kathy Glass and Past President – Anna Lammerding. I particularly want to thank Anna Lammerding for her leadership during the past year. Our Association continued to grow stronger during her term and I pledge to you I will do my best to build on her successes. You have put your trust and confidence in all members of the Executive Board and I know each of us on the Board willingly accepts that charge with reverence and honor.

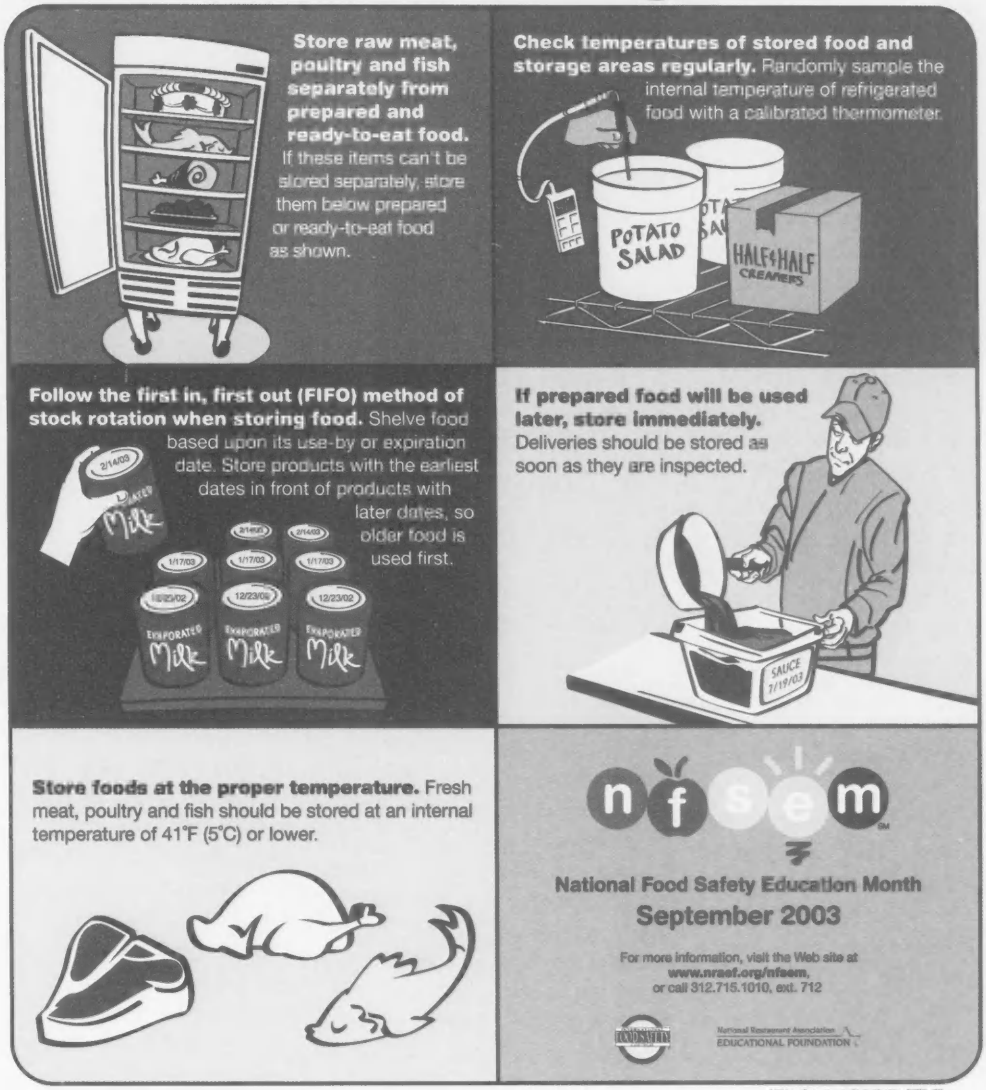
I also want to express my gratitude and appreciation to the IAFP staff led by your Executive Director, David Tharp, for working with excellence every day to serve you with distinction. They are truly a great group of individuals who are professionals in the truest sense of the word. I am pleased to call them not only colleagues, but friends, as well.

The mission of our Association is "...to provide food safety professionals worldwide with a forum to exchange information on protecting the food supply." While each of us have our own reasons for joining IAFP, we have a common bond and goal – protection of our consumers. I personally believe that as food safety professionals, we have a duty and obligation to protect the consumer. I believe that by choosing a career in the food safety profession, we have assumed a sacred responsibility that transcends just working for our companies or institutions. We have a sacred responsibility to do our utmost to assure that the food supply is safe for everyone. It is our sacred responsibility to make prudent decisions on behalf of our consumers and to help educate those food producers, preparers, and manufacturers around the world who lack the skills or knowledge to make sound food safety decisions. In my opinion, IAFP is the premier Association enabling food safety professionals to live up to this sacred responsibility. From the Annual Meeting to the IAFP Affiliates to the Professional Development Groups to the IAFP Foundation to the two premier food safety publications (*Journal of Food Protection* and *Food Protection Trends*) and much more, your Association endeavors to help you succeed in meeting this sacred duty.

The politicians in the United States like to say the US food supply is the safest in the world. While this may be true, we know that the burden of foodborne illness in the US, and indeed, around the world is too high. I believe that if each of us views our profession as a sacred responsibility rather than merely a job, we will ultimately reduce the burden of foodborne illness. It is up to you to take full advantage of your great Association. Become active in IAFP — join an Affiliate, volunteer for a Committee or PDG, attend the Annual Meeting, contribute to the Foundation Fund or ask a friend to join. Do something each day to fulfill your sacred responsibility and take full advantage of your Association to help you do the best you can do. Please e-mail me at Phall@kraft.com and let me know your thoughts. Until next month...

September — National Food Safety Month

Store it. Don't ignore it.

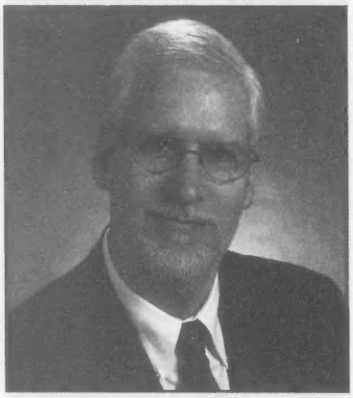


"COMMENTARY"
FROM THE EXECUTIVE DIRECTOR

This month we welcome Paul Hall as President of the International Association for Food Protection. It is the beginning of Paul's fourth year on the Executive Board and his twentieth year as an IAFP Member! Anna Lammerding, now our Past President, had an excellent year as President and we now look forward to making further advances under Paul's direction.

Upon completion of our Annual Meeting, new Officers take their office and those completing their terms rotate off the Board. We want to thank Jim Dickson, our most recent Past President to rotate off the Executive Board, for his service to the Board and to the Association. In addition, our Affiliate Council Chair position on the Executive Board turns over annually. Gene Frey recently completed his service to the Board in this position. Thanks Gene for your dedication, direction and involvement.

Our current Executive Board is made up of Paul Hall, President; Kathy Glass, President-Elect; Jeff Farber, Vice President; Frank Yiannas, Secretary; Anna Lammerding, Past President; and Steve Murphy, Affiliate Council Chairperson. These six individuals have a combined length of Membership in IAFP of over 85 years! That is a lot of experience and knowledge to bring together in one room for the betterment of IAFP and we appreciate the commitment and contribution that each Board Member is making to the Association.



By DAVID W. THARP, CAE
EXECUTIVE DIRECTOR

"We are very proud of the leadership of IAFP"

That brings us to how *you* can affect the direction of the Association through its leadership, the Executive Board. Currently, we are taking nominations for Members to stand for election to the office of Secretary for the year 2004 – 2005. A Member from the education sector will be elected early in 2004 to begin serving upon conclusion of IAFP 2004 (August 12, 2004). If you know of someone from the education sector who you think would be a qualified candidate, contact either Sam Palumbo (see page 743) or me and we will enter their name into the selection discussion to be held by the Nominating Committee. Self-nominations are also encouraged. Sam is the Chairperson of the Nominating Committee and would love to hear from you!

Each candidate for Secretary commits to the Association that they are willing to serve five years on the Executive Board. This involves a time commitment to attend four Board meetings annually including Board meetings at the Annual Meeting. Of course, communication between Board meetings takes place via E-mail and telephone. If you ask any of our Past Presidents, I believe they will tell you that the years they served on IAFP's Executive Board passed very quickly and those years were the most rewarding of their professional career! Again, we encourage your nominations for the office of Secretary; the nomination deadline is October 31 so please hurry.

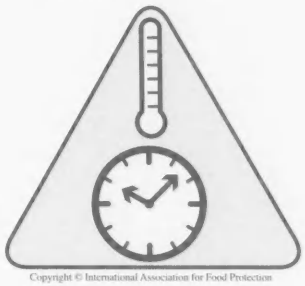
As you can see, we are very proud of the leadership of IAFP. These are all individuals who are successful in their own positions who are willing to share their expertise to help guide the Association. We appreciate their willingness to serve and the hours they commit. There are many opportunities for involvement in IAFP and the Executive Board represents the cream-of-the-crop because you, our individual Members, elect them! Thanks to our current Board and to all past Board Members for your giving back to the International Association for Food Protection. You can certainly be proud of your accomplishments!

International Food Safety Icons

Available from International Association for Food Protection®

Handwashing

Potentially Hazardous Food



Cooking

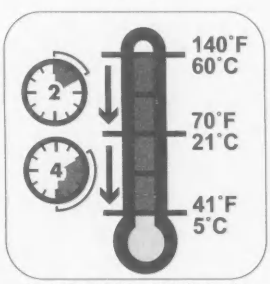
Do Not Work If Ill

Cross Contamination

Wash, Rinse, and Sanitize

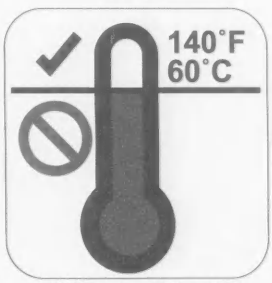
No bare hand contact

Cooling

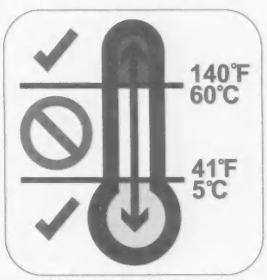


Refrigeration/Cold holding

Hot Holding



Temperature Danger Zone



For additional information, go to our Web site: www.foodprotection.org or contact the IAFP office at 800.369.6337; 515.276.3344; E-mail: info@foodprotection.org

LETTER *to the* EDITOR

March 6, 2003

Dear Dr. LaGrange:

I read with some concern a comment made in the January 2003 edition of *Food Protection Trends* in the article by Mossel et al. On page 18 under the sub-heading "Improper Use of Antibiotics" there is a sentence that reads, "A similar problem originates from the addition of fluoroquinolones to pig and poultry feed (point 3 of Table 1)". This is a completely erroneous and misleading statement. Point 3 of Table 1 refers to phasing out of growth promoters and fluoroquinolones have never been used in feed growth promoters in pigs and poultry.

Such statements are inflammatory and do nothing to enhance the quality of your normally excellent publication. I would ask that a corrigendum be issued immediately to correct this serious error.

Yours sincerely,

Dr. Peter Silley
Research Director
Don Whitley Scientific Limited
14 Otley Road, Shipley
West Yorkshire, BD17 7SE, UK

RESPONSE TO LETTER *to the* EDITOR

July 18, 2003

Dear Dr. LaGrange:

Dr. Silley's letter draws a reader's attention to an inaccuracy in the first part of our review paper, arguing for a holistic postgraduate training course in Food Safety. He is correct in pointing out that fluoroquinolones have never been added as growth promoters to the feed of pigs and poultry. They may, however, be administered to populations of animals on the prescription of a veterinary surgeon. Hence, the error does not invalidate our argument that the potential abuse of chemotherapeutic agents and antibiotics in animal production may constitute a menace to the public. This could result from contributing to deprive the physician from an effective medication, because the target pathogens have acquired resistance to a particular antimicrobial medicine.

The authors thank Dr. Silley for pointing out their error, and the Scientific Editor of *Food Protection Trends* for allowing us the opportunity to make this correction.

Yours sincerely,

J. M. Cowden, G. P. Morris, D. A. A. Mossel, and Corry B. Struijk

Eijkman Foundation for Postgraduate Education and Research in Public Health
Microbiology of Food and Drinking Water
Utrecht University
P.O. Box 6024, 3503 PA Utrecht,
The Netherlands

ARTICLES

Food Protection Trends, Vol. 23, No. 9, Pages 728–734

6200 Aurora Ave., Suite 200W, Des Moines, IA 50322-2864

International Association for Food Protection

An Assessment of the Safety of Cooling Large Cooked Meats in the Catering Sector

NISSREEN ABU-GHANNAM[1]* and PADRAIC O'BRIEN[2]

[1]*Department of Food Science and Environmental Health, Dublin Institute of Technology, Cathal Brugha Street, Dublin 1, Ireland; [2]Western Health Board, Galway, Ireland

SUMMARY

Because of an increasing trend toward cooking large meat joints in advance of service, the process of cook-chill has become an integral part of the catering sector. However, there is concern that the cook-chill process is being adopted by many conventional catering establishments that are significantly lacking in the technology and management required for the process to be safe. Compliance and practices associated with the safety of the cook-chill process were examined in a range of 50 premises consisting of hotels, restaurants and take-aways. Significant malpractice was seen in the cooling of large cooked meats. None of the premises surveyed had rapid chillers, although 95% of them perform the cook-chill practice. Consequently, the cooling time required to reach the recommended 10°C extended for up to 9 h, in contrast to the specified maximum of 150 min, resulting in conditions appropriate for *Clostridia* growth. Approximately 50% of respondents were unaware of the relevant guidelines and opted to use guides that require less management control and financial investment. The cook-chill process in the catering sector lacks compulsory specifications, which may have misled caterers into concluding that their cooling practices are safe. Quantitative assessment of the cooling process through temperature monitoring provides a powerful tool for communicating to caterers the hazards associated with slow cooling of large cooked meats.

A peer-reviewed article

*Author for correspondence: Phone: 00.353.01.4027570; Fax: 00.353.01.8788721; E-mail: nissreen.abughannam@dit.ie

INTRODUCTION

In direct response to consumers' demands for greater menu variety and speed of service, food service establishments, in particular those with limited staff and equipment resources, have changed their catering techniques. There is now a greater tendency to cook meat in advance, after which it is cooled and stored under refrigerated conditions performed until it is either reheated or served cold at a later time. When performed correctly, this process enables the caterer to produce a wide variety of products in a time-efficient manner; however, if the process, in particular the cooling stage, is neglected, the safety of the end product may be severely endangered. When there is a time lapse between cooking and serving, a hazard is present, and the cooling of cooked meats is a process that has been adopted to control this hazard.

In the Irish standards for good manufacturing practice, I.S.340 "Hygiene in the Catering Sector" *(2)* specifies that the minimum temperature that must be achieved during cooking is 74°C for not less than two minutes at the centre of any food. Using this standard as a benchmark for the practices in food service establishments, it follows that only pasteurization is achieved by temperatures and times used to cook and prepare food *(8)*. It ensues that there is always the possibility that some microorganisms that produce spores, such as *Clostridium perfringens*, will not be killed in the cooking process. *C. perfringens* has been implicated in numerous foodborne disease outbreaks because of its ability to produce heat-resistant spores that can survive and germinate in cooked beef and poultry if the rate and extent of cooling is not sufficient *(7)*. Although the temperature range for growth of *C. perfringens* is 6°C to 52.3°C, rapid growth occurs between 35°C and 48.9°C. The short generation time of the organism, 7.1 to 20 minutes during the rapid growth range, means that fast cooling of foods is essential after spores have germinated *(6)*. Another hazard associated with cooking meat in advance of service concerns the potential for post-cooking microbiological contamination of the cooked product. In a study by Bryan *(4)*, cooked roast beef joints were found to become re-contaminated with *Salmonella* from workers' hands, equipment and utensil surfaces that had been in contact with raw products. In addition, Gaze et al. *(5)* stated that post-cooking contamination with *E. coli* O157, *Salmonella* spp. or *Listeria monocytogenes* has frequently been implicated as the cause of food poisoning incidents related to consumption of cooked meats.

Relevant legislation and guidelines

In Ireland, two guides to good manufacturing practices contain standards and criteria relevant to the safe cooling of cooked meats.

The first guide, I.S.340 "Hygiene in the Catering Sector" *(2)*, is used by the vast majority of catering establishments as a benchmark for their practices. It identifies as far as practicable the specific requirements that caterers must meet to ensure that the food they serve is safe, sound and wholesome. The information relevant to the cooling of cooked meat reads:

(i) When cooling cooked food; the food shall be cooled by using a blast chiller, by placing it in a cool area, or other suitable means immediately after cooking.

(ii) Cooled food shall be placed under refrigerated conditions within 90 minutes after cooking, and shall reach a temperature of less than 10°C, within 150 minutes after cooking has commenced.

It is apparent that although the guide prescribes specific time-temperature requirements it is equivocal as to how these specifications are to be achieved; it places no distinct obligation on the caterer to use a blast chiller and overlooks important factors such as restraints on the size of the joints. Subsequently, allowing caterers the discretion to make such decisions is potentially hazardous.

The second guide, "Guide for Cook-Chill Systems in Hospitals and Catering Premises" *(1)* (hereafter called the Cook-Chill guideline), also contains information on how food cooked in advance of service should be processed and stored in order to avoid the aforementioned hazards. In contrast to I.S.340 *(2)*, this second guide gives a comprehensive specification of the standards required both before and during the cooling of cooked meats. Principally, this guide stipulates *that food must be chilled to 10°C in a blast chiller as soon as possible after cooking within 150 minutes of removal from the cooker.* Although this time-temperature requirement is identical to that in I.S.340 *(2)*, to achieve this rate of cooling and ensure the safety of the cooled product, the following additional stipulations are included:

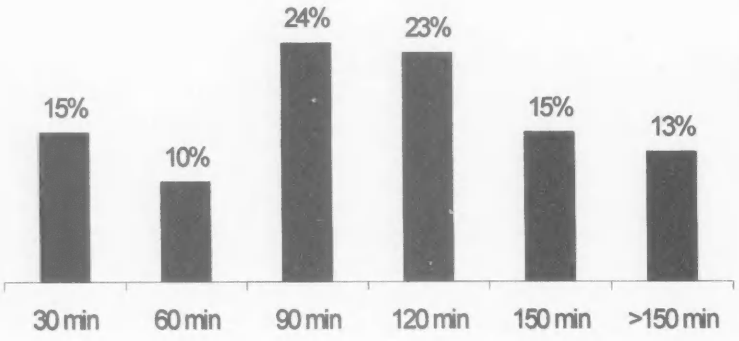
(i) To facilitate cooling after cooking, the joints of meat should not exceed 2.5 kg in weight, and 150 mm in thickness or height.

(ii) In order to preserve the appearance, texture, flavor, nutritional quality and safety of the cooked product, chilling should commence as soon as possible after completion of cooking and in any event within 30 minutes of leaving the cooker.

(iii) Storage life for the cook-chilled product should not be greater than 5 days, including the day of production and the day of consumption.

It is apparent that the latter guide is more thorough than I.S. 340 in its instruction to the caterer with regard to the cooling of cooked meats. It could be argued that because it is

FIGURE 1. Duration and percentages of premises that cooled and cooked meat at ambient temperatures



directed towards hospital catering establishments, and as a result of the immuno-suppressed nature of their population, the standards should be more stringent. However, both guides refer to the cooling of cooked meats subject to re-heating at a later date; therefore, there appears to be no justification for inconsistency in the standards. Moreover, the fact that the time-temperature requirement for a safe rate of cooling is identical in both guides further raises the question of why the latter guide requires that additional controls be implemented to achieve a safe process. Furthermore, as the vast majority of premises are using I.S.340 *(2)* as their guide to good manufacturing practice, it is possible that they are failing to fully control the hazards associated with this process. Despite the ability of meat to support microbial growth, because such premises do not cook *all* their food in advance, at present they are not classified as "cook-chill premises", and although they are operating a process that essentially incorporates the principles of cook-chill with their joints of meat, they are not required to meet the criteria contained in these guidelines.

In the cooling of large cooked meats, a food safety target is in place, i.e., cooling meat to a temperature of less than 10°C within 150 minutes after cooking has ended. However, the means of achieving this target are not fully clear for caterers, which has led a number of Environmental Health Boards to question the safety of the process. Subsequently, this study was initiated to:

- determine factors that compromise the safety of cooled large cooked meats such as pre-cooking and post-cooking practices, and determine whether attitudes to food safety systems are consistent with the relevant guidelines.
- quantify the extent of risk by means of temperature monitoring throughout the cooling process, a process that provides a suitable means of communicating potential food safety risks to those involved in the catering industry.

MATERIALS AND METHODS

Compliance and practices associated with the cook-chill process were examined through use of a survey covering a range of 50 premises, consisting of hotels, restaurants and take-out establishments. A questionnaire was designed to collect information from participants regarding the scale of their premises, practices employed and attitudes toward specialist cook-chill technology. During questionnaire item development, an attempt was made to use terminology in common, everyday use. The questionnaire consisted of three sections. Section one contained general questions relevant to every premise, regardless of the cooling method used; section two was comprised of questions specific to premises that did not have specialist technology; and section three consisted of questions specifically related to premises employing a specialist cooling system.

Temperature monitoring experiments were conducted in selected catering premises. A full temperature history of the cooked meat joint was measured from the moment the sample was deemed fully cooked and throughout the entire cooling process. For temperature measurement, a Testostor 175-1 temperature data logger was used. This apparatus consists of a 15 cm stainless steel probe connected by a short cable to an electronic data logger. Both the external probe and the data logger itself have a built-in sensor that can measure the temperature of their respective environments, within a fixed measurement interval. The data logger then records and stores both values separately. The number of required measurements and the measuring interval can be set by the user using the Testostor 175-1 software package. Once the external probe and data logger unit are activated, each begins measuring the temperature of its environment. When all set measurements are completed, the recorded data is uploaded to a computer using either the Testostor Software or Microsoft Excel. Some premises tested operated blast chillers during the cooling of cooked meat and others did not.

FIGURE 2. Distribution of storage life allocated to the cooled meats in the premises surveyed

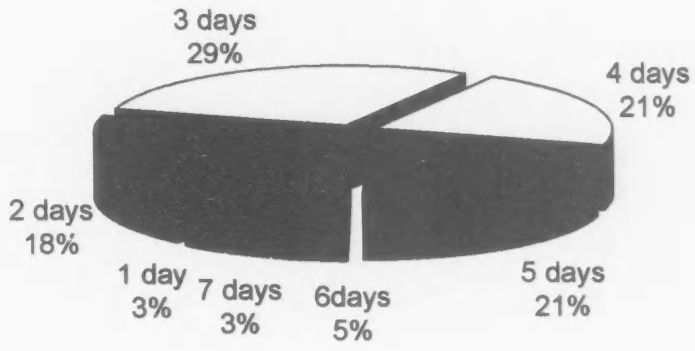
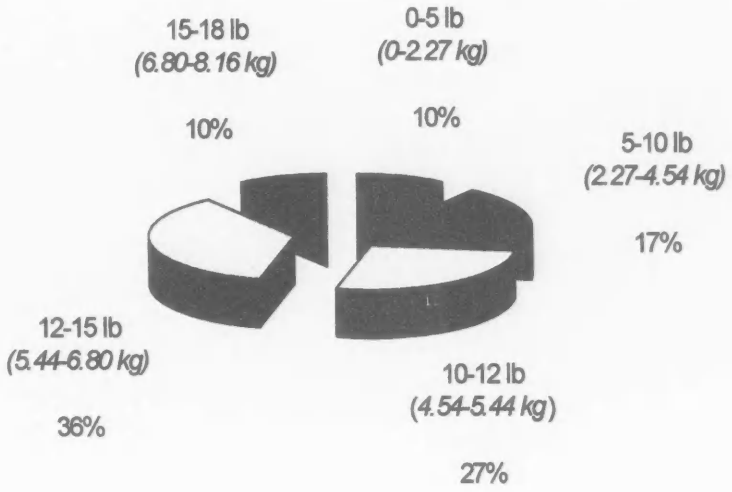


FIGURE 3. Distribution of weights of beef joints cooked in the premises surveyed



RESULTS AND DISCUSSION

Survey results

Fifty-nine percent of caterers cooled their cooked meat directly after cooking, and 36% of the premises operated a catering system in which the cooked product was served immediately after cooking and any excess was cooled and stored under refrigerated conditions until at a later date. Thus 95% of the sample population performed the process of cooling cooked meats at some stage in their catering system. This statistic highlights the widespread practice of cooling cooked meat in the catering sector and emphasises the need to establish whether the relevant personnel were acquainted with the guidelines regarding cooling times, temperatures and associated controls. The survey showed that approximately half of those cooling their cooked meats are unfamiliar with relevant guidelines, which is reflected in the fact that none of the premises surveyed have rapid chillers, necessary for achieving compliance with the Cook Chill guideline *(1)*. Instead, 95% cooled their cooked meat in accordance with the stipulations in I.S.340 *(2)*, by placing it under ambient conditions to cool prior to refrigerating it. The remaining premises (5%) cooled their cooked meat by placing it directly into a refrigerator immediately after cooking, despite a clear warning that this may excessively raise the temperature of the refrigerator, leading to temperature abuse of the products within.

In light of the proportion of premises cooling their cooked meat at ambient conditions, it was decided to investigate the location of this preliminary cooling step. The survey showed that 63% of catering establishments place cooked product on the preparation table to cool, indicating a significant potential for post-cooking contamination in the majority of catering premises.

With respect to the duration of preliminary cooling time, I.S.340 *(2)* specifies a maximum time of 90 minutes, after which the cooked product should be placed under refrigerated conditions, but it fails to specify a minimum time during which the product should be allowed to cool. This study indicates great variance in the duration of the preliminary cooling times used, as shown in Figure 1. Although all establishments were essentially complying with the guideline specification, 10% refrigerated the product within 60 minutes and a further 9% stated that the preliminary cooling lasted only 30 min, which may be insufficient to avoid excessive temperature increase within the refrigerator.

At the other extreme, 18% of the premises refrigerated the cooked meat within 120 minutes, 12% within 150 minutes and 10% after a time exceeding 150 minutes. Given that the guidelines specify cooling to 10°C within 90 min, the recorded cooling procedures in this study are grossly insubordinate.

FIGURE 4. Cooling rate of a 2.5 kg beef joint using a rapid-chiller

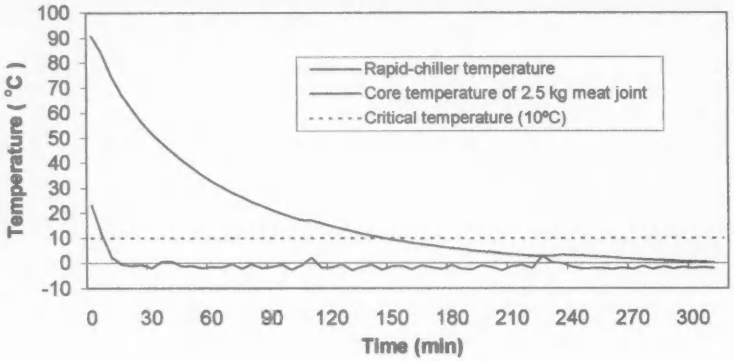
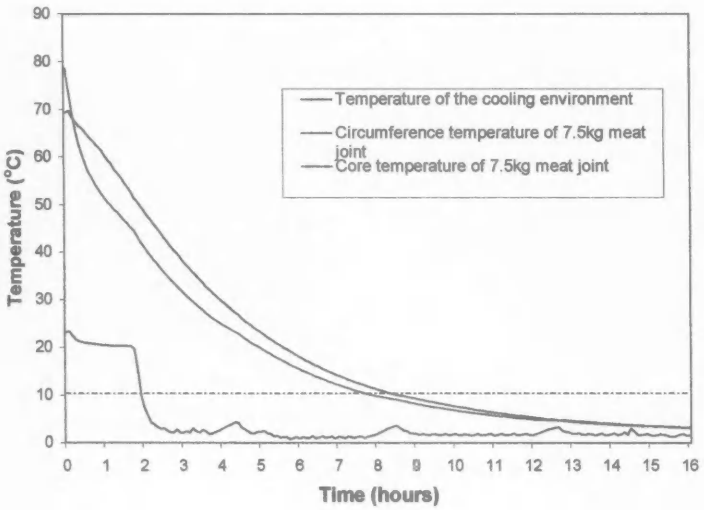


FIGURE 5. Cooling rate of a 7.5 kg comminuted beef roll without the use of a rapid chiller



The storage life allocated to the product after cooking was also considered in relation to hazards associated with the cooling process. The data in Figure 2 illustrates that 71% of premises stored their cooked product for 3 to 5 days prior to service and about 8% stored the product for as long as 6 to 7 days. Because even under the stringent provisions of the Cook-Chill guideline *(1)*, the maximum permissible storage life is 5 days, such data are a cause for concern.

The Cook-Chill guideline *(1)* identifies the size of joints as a factor influencing the cooling rate and specifies that joints should not exceed 2.5 kg (5.51 lb.). Survey results showed that 90% of premises regularly cooked joints of beef that weighed more than 2.5 kg. Most premises cooked joints weighing 7 to 8 kg (15.44–17.64 lb.). Moreover, a sizeable proportion (75%) of premises cooked and cooled turkeys in excess of 10 kg as seen in Fig. 3.

The majority of the surveyed premises were satisfied with their cooling methods, as a substantial proportion (75%) rated their cooling system 8 to 9 out of 10 (where a score of 10 was considered excellent). This suggests that caterers are unaware that their cooling procedures are non-compliant. When asked why they did not acquire a blast chiller, 67% of respondents stated that it was too expensive, while the remaining 33% believe that adequate cooling can be achived without use of a blast chiller.

Temperature monitoring and evaluation of the cooling rate

As a result of the large size of joints and the lack of rapid chill technology in cooling regimes, rates of cooling based on practices used in the catering sector were determined. Temperature sampling was carried out with a temperature probe datalogger that measured the temperature at the core of the sample at pre-set intervals of 5 minutes from the moment the sample was deemed cooked throughout the entire cooling process. Simultaneously, a second thermometer measured the temperature of the cooling environment. Figure 4 represents findings from temperature sampling in a hospital department catering for 600 patients and staff every day, with a system indicative of a modern cook-chill facility. The process is stringently controlled based on the provisions specified in the cook-chill guidelines *(1)*. The core temperature of a 2.5 kg roast was measured during cooling in a rapid chiller. Figure 4 shows that the core temperature was approximately 91°C, immediately after cooking. The temperature of the rapid chiller was recorded at 1.36°C (standard deviation 1.19°C). A total of 145 minutes were required to bring the joint to 10°C. Therefore, the cooling rate was sufficient to meet the requirements of the guidelines.

FIGURE 6. Temperature variations within the refrigerator due to cooling a 2.5 kg cooked meat joint

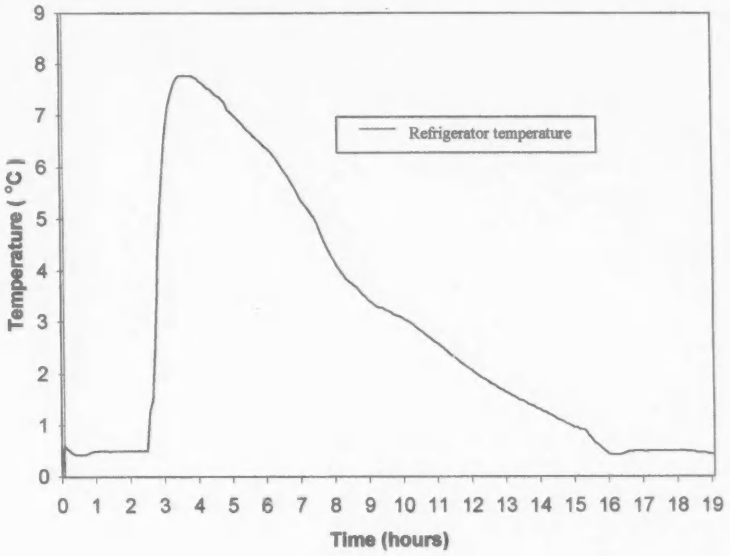


Figure 5 is more representative of results obtained with the cooling process employed by the majority of premises in the catering sector. The premise is a hotel that caters for upwards of 300 covers daily. As in the majority of catering establishments, cooling is done without the use of rapid chillers, and there is little restriction on the size of the joints cooked. Consequently, the sample used for this experiment was a 7.5 kg (16.54 lb.) comminuted beef roll, cooled by placing it on a preparation table for 90 min, after which it was placed into a refrigerator to cool fully. Because of the large size of the sample, temperatures were recorded from two locations on the cooked meat: at the core and at the circumference, to determine whether the cooling rate varied between the two points. Since temperature measuring began immediately after cooking, Figure 5 also provides information on the final cooking temperature. The final temperature of the circumference reached 78.62°C, while the core temperature reached only 69.31°C, rather than 74°C, as is required by I.S.340 *(2)* for destruction of vegetative cells of some pathogens. This therefore highlights the principal hazard with cooling large meats, as any bacteria present could proliferate if the internal temperature is not reduced quickly. Also, because the sample was of a comminuted nature, the risk that bacteria may be present is significantly greater. Figure 5 shows that it took nearly 8 h for the temperature of the circumference to cool to the required 10°C, while the core temperature took an additional 40 min to reach the same level. When these figures are compared to the guidelines, the cooling time exceeded the maximum time allowed by 6 hours. In recent findings by the U.S. Food Safety and Inspection Service *(3)*, it was established that excessive time in the 55°C to 25°C range is especially hazardous, as this is the range of most growth for *Clostridia*. It was recommended that the products' internal temperature should not remain within this temperature range for more than 1.5 hours.

As a result of inconsistencies in the duration of the preliminary cooling and the tendency indicated in the survey to cool cooked meats in low capacity refrigerators, the effect of the cooked joint on the temperature environment of the refrigerator was investigated. As seen in Figure 6, the average temperature of the refrigerator prior to the cooling of a 2.5 kg cooked sample was 0.49°C. However, within 60 min after the cooked meat was placed in the refrigerator, the temperature rose to 7.78°C and it remained above 5°C for 4 h and 40 min. In total, the refrigerator temperature was affected for 14 h by the presence of the cooked product. Although it may be argued that the resulting temperature of 7.78°C is not extremely hazardous, considerations should be given to the fact that the initial temperature of the refrigerator was exceptionally low, and if a similar increase were to occur in a refrigerator operating at a higher temperature, a more serious temperature abuse would be expected. Furthermore, it must be recognized that the joint sample cooled as illustrated in Figure 6 is relatively small compared to some of the cooked meats used in the premises surveyed. Moreover, on this occasion the sample received a preliminary cooling period of 90 min prior to entering the refrigerator. Because some premises surveyed placed the cooked product directly into the refrigerator immediately after cooking, the expected effects on refrigerator temperature could be immense.

Having compiled information regarding cooling rates and practices during the production of cooked-chilled large meat joints, this study is currently investigating the microbial risks that could arise from both malpractice and inadequate cooling rates. In particular, the potential of *Clostridium perfringens* survival and spore germination during cooking and cooling and the possibility of *Staphylococcus aureus* contamination as an indicator of cross contamination are being investigated.

CONCLUSIONS

This study shows that cooling procedures of large cooked meat joints as applied in the catering sector fail to achieve a safe cooling rate as required by the relevant guidelines and consequently increase the potential risk of foodborne outbreaks. On practical levels, this study suggests the need for product size reduction and rapid chill technology to enhance the safety of the process. However, for these recommendations to be applied, this study was designed to emphasize the importance of communicating current risks to those who are involved directly in food processing and who use procedures and quantities over which they have control. As a result, the approach was directed towards quantifying temperatures during the different methods of cooling currently in use, alongside practices pre- and post-cooking procedures, in order to achieve appropriate levels of consumer protection. The outcome has been of substantial assistance for a number of catering premises that apply the cook-chill process.

It is critical that factors compromising food safety should be simplified in a manner that is both understandable and amenable for all those directly involved in the production of safe food.

REFERENCES

1. Anonymous. 1991. Guidelines on cook-chill systems in hospitals and catering premises, report No. 7. Food Safety Advisory Committee. Dublin: Stationary Office.
2. Anonymous. 1994. Hygiene in the catering sector, I.S.340. National Standard Authority of Ireland. Dublin: Stationary office.
3. Anonymous. 1999. Compliance guidelines for cooling heat-treated meat and poultry products (Stabilization). Food Safety and Inspection Service, United States Department of Agriculture, Washington, D.C.
4. Bryan, F. C. 1988. Risks associated with vehicles of food borne pathogens and toxins. J. Food Prot. 51: 498–508.
5. Gaze, J. E., R. Shaw, and J. Archer. 1998. Identification and prevention of hazards associated with the slow cooling of hams and other large cooked meats and meat products. Review No. 8, Project No. 16286. Campden and Chorleywood Food Research Association, Gloucestershire, England.
6. Jay, J. M. 2000. Modern Food Microbiology, 6th Ed. Aspen Publishers, Gaithersburg, Maryland.
7. Juneja, V. K., O. P. Synder, and M. Cygnarowicz-Provost. 1994. Influence of cooling rate on outgrowth of *Clostridium perfringens* spores in cooked ground beef. J. Food Prot. 57:1063–1067.
8. Juneja, V. K., O. P. Synder, and B. S. Marmer. 1997. Potential for growth from spores of *Bacillus cereus* and *Clostridium botulinum* and vegetative cells of *Staphylococcus aureus*, *Listeria monocytogens* and *Salmonella* serotypes in cooked ground beef during cooling. J. Food Prot. 4: 272–275.

Food Protection Trends, Vol. 23, No. 9, Pages 735–742

Comparative Survival of *Staphylococcus epidermidis*, *Listeria monocytogenes*, and *Staphylococcus aureus* on Hot-Smoked Fish

STEVEN C. INGHAM* and MARIA M. LAU
Department of Food Science, University of Wisconsin-Madison,
1605 Linden Drive, Madison, WI 53706-1565, USA

SUMMARY

Inappropriate hand-to-food contact may contaminate manually processed foods such as hot-smoked fish with *Staphylococcus aureus* and *Listeria monocytogenes*. Staphylococci, including the important skinborne species *S. epidermidis*, have been proposed as indicators of hand-to-food contact. This study examined the survival of *S. epidermidis* on various hot-smoked fish stored at 5 and 10°C and compared this survival to that of *L. monocytogenes* and *S. aureus*. Populations of *S. epidermidis* declined by 0.6 to 1.5 log units on the interior flesh and skin surfaces of hot-smoked chubs during 10 days at 5 and 10°C. On the interior flesh surface of hot-smoked lake trout, whitefish, and salmon, *S. epidermidis* numbers declined by 0.2 to 1.2 log units during 21 days at 5°C. Decreases of *S. aureus* (1.0 to 2.4 log units) were greater than those of *S. epidermidis*, while *L. monocytogenes* grew by 3.2 to 3.7 log units on hot-smoked chubs during 10 days at 10°C and 0.7 to 3.2 log units on hot-smoked lake trout, whitefish, and salmon stored for 21 days at 5°C. The results show that (1) *L. monocytogenes* can quickly grow to high numbers on hot-smoked fish at 5 and 10°C and thus post-smoking contamination should be prevented, and (2) if staphylococci numbers are to be used by quality control personnel as an indicator of post-smoking manual contamination, then testing must be early in the hot-smoked fish shelf life.

A peer-reviewed article

*Author for correspondence: Phone: 608.265.4801; Fax: 608.262.6872;
E-mail: scingham@facstaff.wisc.edu

TABLE 1. Percent water-phase salt in hot-smoked fish used in experiments 1 and 2

Species, size, format	Processors	% water-phase salt[a]
Chub, medium, whole[b]	A	3.3
Lake trout, 1.8 kg,[c] whole	A	3.8, 4.4
Lake trout, 1.4 kg,[d] whole	A	3.7, 4.8
Whitefish, steak chunks	B	3.8
Salmon, steak chunks	A	3.2

[a] Each value given is the result for one whole fish or chunk

[b] Whole eviscerated fish

[c] Minimum size of fish in batch

[d] Minimum size of fish in batch; fish did not exceed 1.8 kg

INTRODUCTION

Each year, there are an estimated 76 million cases of foodborne disease in the United States. Among these cases are an estimated 2,500 cases of infection caused by foodborne *Listeria monocytogenes* and an estimated 185,000 cases of intoxication resulting from *Staphylococcus aureus* production of heat-stable enterotoxin(s) in foods *(15)*. For the latter pathogen, actual numbers of cases probably far exceed the numbers of reported cases *(9)*. Typical heat treatments of foods, such as pasteurization of milk or cooking of meat, are likely to destroy expected numbers of both *L. monocytogenes* and *S. aureus*. As a result, ready-to-eat foods that have been contaminated after cooking are typically involved in outbreaks of foodborne listeriosis and staphylococcal intoxication. An important way in which *L. monocytogenes* and *S. aureus* may contaminate ready-to-eat foods is by contact with human hands. *Staphylococcus aureus* is a common part of the human skin microflora *(10)* and humans can be asymptomatic carriers of *L. monocytogenes (18)*. Both of these pathogens may also be manually transferred from unclean surfaces to food.

The genus *Staphylococcus*, which includes the important skin resident *S. epidermidis* and several other species that may inhabit skin *(13, 14)*, has been suggested as an indicator of post-smoking manual contamination of hot-smoked fish *(16)*. The present study examined the survival of *S. epidermidis* on hot-smoked fish and compared *S. epidermidis* survival to that of *L. monocytogenes* and *S. aureus*, two pathogens that could potentially contaminate hot-smoked fish via manual contact.

In Wisconsin, several species of fish are commercially hot-smoked. Fish-smoking plants are typically small, and the processing involves several manual steps, before and after hot-smoking. Thus, there is ample opportunity for manual contamination of finished products. In an earlier study *(16)*, hot-smoked fish, produced by six processors and representing four fish species, were found to be frequently contaminated (15 of 22 samples) with low levels of staphylococci (< 3 log CFU/fish). The staphylococcal species most commonly isolated from these samples was *S. epidermidis*. *S. epidermidis* isolates from these samples were found to survive poorly on refrigerated hot-smoked rainbow trout containing 4.9 to 6.1% water-phase salt, a level considerably higher than the Wisconsin legal minimum of 2.5% for hot-smoked fish packaged under air *(19)*. In the present study, the survival of *S. epidermidis* was evaluated on several species of hot-smoked fish having salt levels closer to the Wisconsin legal minimum level. To ensure the safety of hot-smoked fish, particularly with respect to *Clostridium botulinum* toxin production, Wisconsin regulations also mandate a maximum storage temperature of 3.3° C (38°F); *(19)*. Some retail and home refrigerators may not achieve this low temperature, so the present study evaluated *S. epidermidis* survival on hot-smoked fish at 5 and 10°C.

Numerous studies have found *Listeria* spp. and *L. monocytogenes* on hot-smoked and cold-smoked fish, although it is not clear whether hot-smoked fish are more likely to be contaminated than cold-smoked fish *(2, 4 – 7, 12)*. Cold-smoked trout contaminated with *L. monocytogenes* were implicated as the cause of a listeriosis outbreak in Sweden *(5)*, but no listeriosis outbreaks have been linked to contaminated hot-smoked fish. In the United States, there have been no reported listeriosis outbreaks linked to consumption of cold-smoked or hot-smoked fish. At refrigeration and slightly abusive temperatures, *L. monocytogenes* reportedly can grow well on hot-smoked fish *(11)*, and it has been speculated that *L. monocytogenes* would grow more rapidly on hot-smoked fish than on cold-smoked fish because hot-smoking reduces numbers of competing microbes *(12)*.

In our earlier study, *S. aureus* was found on 3 of 22 hot-smoked fish samples *(16)*. Hot-smoking and high salt levels reduce potential microbial

competition for *S. aureus* contaminating the fish after smoking. Thus, there is a theoretical possibility of staphylococcal enterotoxin production at highly abusive temperatures. However, it is unlikely that *S. aureus* will grow and produce enterotoxin on hot-smoked fish at 5 or 10°C.

In addition to evaluating *S. epidermidis* growth on hot-smoked fish at 5 and 10°C, we concurrently evaluated the survival/growth of *L. monocytogenes* and *S. aureus* under the same conditions. These evaluations were done to determine if using staphylococci as a post-smoking hygiene indicator would provide misleading information about risks associated with manual contamination of hot-smoked fish with *L. monocytogenes* or *S. aureus*.

MATERIALS AND METHODS

The first experiment in this study involved concurrently inoculating the skin and interior (belly cavity and flesh) of hot-smoked chubs (*Coregonus hoyi*) with *S. epidermidis*, *L. monocytogenes*, and *S. aureus*, and storing the inoculated fish at 5 and 10°C. In the second experiment, each bacterial species was inoculated separately on only the interior flesh surface of hot-smoked lake trout (*Salvelinus namaycush*; two different sizes: ca. 1.4 and 1.8 kg per fish), whitefish (*Coregonus clupeaformis*), and salmon (*Oncorhynchus kisutch*), which were stored only at 5°C.

Hot-smoked chubs (eviscerated whole fish), lake trout (eviscerated, headed whole fish, two sizes), whitefish (steak chunks), and salmon (steak chunks), produced by two different processors (all but whitefish from processor A), were obtained from a local grocery store and transported immediately (< 15 minutes) to the laboratory. The hot-smoked fish were frozen at -20°C for up to 6 weeks. Prior to use in experiments, frozen fish were thawed at 5°C for 24 h.

From each batch of fish studied, a single sample was frozen (-20°C) and later sent to a commercial laboratory for percent water and percent salt analyses. The methods used for these analyses were AOAC International methods 950.46Bb and 980.25 *(1)*. Percent water-phase salt for each sample was calculated as [% salt/(% water + % salt)] × 100 and is shown in Table 1.

Three strains each of *S. epidermidis*, *L. monocytogenes*, and *S. aureus* were used. The strains of *S. epidermidis* (2-20-5CII, 2-6-3AI, and 2-6-4BI) were originally isolated from hot-smoked salmon, whitefish, and salmon, respectively *(16)*. The strains of *L. monocytogenes*, H0222, F8027, and F8369, were obtained from the culture collection of Dr. Larry Beuchat at the University of Georgia Center for Food Safety and Quality Enhancement; the cultures were originally obtained from raw potato, celery, and corn, respectively. *Staphylococcus aureus* strains FRI 100 and FRI 1007 were obtained from Dr. Amy Wong of the University of Wisconsin-Madison Food Research Institute, and strain ATCC 12600 from the American Type Culture Collection (Manassas, VA). Frozen (-20°C) stock cultures of *S. epidermidis* and *S. aureus* in double-strength brain heart infusion (BHI; Difco, Becton Dickinson, Mansfield, MA) with 20% (v/v) added glycerol (Sigma, St. Louis, MO) and of *L. monocytogenes* in BHI with 10% added glycerol were streaked on duplicate plates of BHI agar (Difco), which were then incubated for 48 h at 35°C. From each plate, a typical isolated colony was separately transferred to 5 ml BHI and incubated for 18 h at 35°C. These cultures were then centrifuged at 5,000 × g for 8 min and the supernatant decanted. Each culture was then resuspended in 5 ml of Butterfield's Phosphate Diluent (BPD; International BioProducts, Inc., Bothell, WA).

In the first experiment, the head and tail of each hot-smoked chub was removed and the remaining fish placed on an 11.5 × 20 cm polystyrene deli-type tray (Harder Paper and Packaging, Madison, WI). In the second experiment, the heads and tails of hot-smoked lake trout were removed. Each remaining lake trout was then cut into 7.6 cm long steaks and each steak was placed on a single deli-type tray. Hot-smoked steaks of whitefish and salmon (7.6 and 6.3 cm long steaks, respectively) were purchased and each steak was placed on a tray.

In the first experiment, one resuspended culture of each of the inoculum strains were combined; 0.05 ml of the resulting "cocktail" was pipetted onto the interior (belly cavity and flesh) surface and 0.05 ml was pipetted onto the upper skin surface of each hot-smoked chub. The inoculum was distributed over each surface by use of a sterile glass "hockey stick". After allowing the inoculum to soak into the fish during 30 minutes in a bio-safety hood, each fish was inverted on its tray and the other skin side was inoculated as described for the first side. The inoculated fish were allowed to dry in the biosafety hood for an additional 30 minutes and then each fish, on its tray, was wrapped in a clear commercial deli-style plastic wrap (45.7 cm-wide Omnifilm, Pliant Corp., Uniontown, OH; oxygen transmission rate per ASTM D3985 of 1100 cm^3/645 cm^2 per 24 h). This procedure was repeated for a second replicate of inoculum with the same lot of hot-smoked chubs. Using this procedure, initial levels of 10^4 to 10^5 log CFU per fish surface (both interior surfaces or both skin surfaces) were obtained. In the second experiment, separate cocktails were made in duplicate for each inoculum species. The interior surfaces of hot-smoked lake trout, whitefish, and salmon were inoculated as previously described except that separate fish pieces were used for each inoculum species. In this experiment, initial levels of 10^5 to 10^6 CFU per fish (both interior surfaces) were obtained.

After inoculation, wrapped trays of hot-smoked fish were stored at 5 and 10°C (first experiment) or 5°C (second experiment). In the first experiment, the skin surfaces and interior surfaces of three fish were separately analyzed for numbers of *S. epidermidis*, *L. monocytogenes*, and *S. aureus* at day 0, and similar analyses were done at day 10 for two fish each from 5°C and 10°C storage. An additional two fish from 10°C storage were analyzed at day 5. In the second experiment, for each inoculum species two fish each were analyzed microbiologically at days 0, 10, and 21.

No analysis of uninoculated fish was done. Thus any indigenous *S. epidermidis*, *L. monocytogenes*, or *S. aureus* present would potentially have been detected along with the inoculum organisms. To analyze the skin or interior surfaces of a fish in the first experiment, a 3.5 × 7.5 cm (pre-wetted dimensions) sponge from a beef/pork carcass sampling kit (Nelson Jameson, Marshfield, WI) was wetted with ca. 10 ml of BPD provided by the manufacturer. The wetted sponge was then rubbed 5 times (complete back and forth motion) across the entire inoculated surface (approximately 80 cm^2 and 95 cm^2, respectively, for interior and skin of chubs, 115 cm^2 for trout and whitefish steaks, and 95 cm^2 for salmon steaks). The sponge was then returned to the sample bag, the remaining ca. 15 ml BPD was added, and the bag was manually squeezed to remove as much diluent from the sponge as possible. Analysis for *S. epidermidis* was done by spread-plating the diluent (1.0 ml distributed among three plates) and serially diluting the diluent as necessary in BPD and spread-plating 0.1 ml of the appropriate dilution on a single plate of Baird-Parker agar base (Difco) with added mannitol (10 g/l; Sigma), 2.5 ml of 1% (w/v) phenol red (Sigma) and 30 ml of 0.1 g/l of potassium tellurite (Sigma). This medium was denoted BP + MPRT. A variation of this medium had previously been studied for enumeration of staphylococci on hot-smoked fish *(16)*. For analysis of *L. monocytogenes*, 0.1 ml of the appropriate dilution was spread-plated on a single plate of PALCAM agar base (Oxoid, Ogdensburg, NY) with added PALCAM selective supplement (Oxoid). From 1.0 ml of the initial dilution, three spread-plates (0.3, 0.3, and 0.4 ml) of Baird-Parker agar (Difco) with added egg yolk tellurite enrichment (Difco), denoted BP + ET, were prepared for *S. aureus* enumeration. For each subsequent dilution in BPD, 0.1 ml was spread-plated on BP + ET. An additional analysis for *S. aureus* was performed by transferring 1.0 ml of the appropriate dilution to a 3M™ Petrifilm™ Rapid *S. aureus* count plate (PFRSA; 3M Microbiology Products, St. Paul, MN). The BP + MPRT, PALCAM, and BP + ET plates were incubated for 48 h at 35°C and the PFRSA plates were incubated for 24 h at 35°C. Presumptive *S. epidermidis* (small grey colonies with surrounding pink on BP + MPRT), *L. monocytogenes* (grey colonies with black halo on PALCAM), and *S. aureus* (medium-sized glossy raised black colonies surrounded by a clear zone on BP + ET) were counted and the CFU for the sampled surface was calculated. After the initial incubation, the PFRSA plates were incubated at 62°C for 1 to 4 h, after which a thermostable DNAse-reactive disc was placed between the upper and lower halves of each plate and incubated at 35°C for 1 to 3 hours. Pink zones were counted as confirmed *S. aureus*. For all but the PFRSA plates, one typical colony each for *S. epidermidis*, *L. monocytogenes*, *S. aureus* for each sampling time was transferred to BHI agar and incubated for 24 h at 35°C. Isolated colonies were then subjected to confirmation tests as follows: Presumptive staphylococci were tested for Gram reaction, cell morphology, glucose fermentation, mannitol fermentation, catalase production and biochemical characteristics as determined by the API Staph method (bioMérieux, Hazelwood, MO); presumptive *L. monocytogenes* were tested for Gram reaction, cell morphology, beta-hemolysis, catalase production, oxidase production, and biochemical characteristics as determined by the API Listeria method (bioMérieux). In the second experiment, the same methods were used to enumerate inoculum species. Two presumptive colonies of each organism for each type of fish were transferred at each sampling time to BHI agar and identified as just described.

RESULTS AND DISCUSSION

All hot-smoked fish samples tested contained more than the regulatory minimum of 2.5% water-phase salt for hot-smoked fish stored under air (Table 1) *(19)*. However, it appeared that there was considerable variation within batches of hot-smoked lake trout. All of the samples contained less water-phase salt than the 4.9 to 6.1% in hot-smoked rainbow trout used in an earlier study of *S. epidermidis* survival on hot-smoked fish *(16)*. The samples also generally contained less salt (on a total weight basis) than a variety of Canadian smoked fish described in an earlier study *(3)*.

The results of the first experiment clearly showed that *S. epidermidis* and *S. aureus* did not grow well on hot-smoked chubs at 10°C, while *L. monocytogenes* did (Table 2). Staphylococcal populations decreased slightly (an average of 0.4 to 1.1 log units/fish) on hot-smoked chubs during 10 days at 10°C. Numbers of *L. monocytogenes* increased an average of 3.7 and 3.2 log units/fish, respectively, on the skin and interior surfaces under the same conditions. Since 10°C is well above the mandated minimum commercial storage temperature for hot-smoked fish, fur-

TABLE 2. Survival/growth of *Staphylococcus epidermidis*, *Listeria monocytogenes*, and *Staphylococcus aureus* on the skin and interior surfaces of hot-smoked chubs during 10 days storage at 5 and 10°C

Presumptive *S. epidermidis* (log CFU/fish)

	Skin		Interior	
Time (days)	5°C	10°C	5°C	10°C
0[a]	4.2 (0.2)[b]	4.2 (0.2)	4.0 (0.3)	4.0 (0.3)
5	N/A[c]	3.9, 4.1[d]	N/A	4.1, 4.6
10	4.0, 3.2	3.2, 3.4	2.4, 2.7	3.1, 3.2

Presumptive *L. monocytogenes* (log CFU/fish)

	Skin		Interior	
Time (days)	5°C	10°C	5°C	10°C
0[a]	4.3 (0.1)[b]	4.3 (0.1)	4.5 (0.1)	4.5 (0.1)
5	N/A[c]	5.7, 6.7[d]	N/A	6.4, 7.0
10	4.8, 4.8	7.1, 8.9	5.1, 5.1	6.3, 9.1

Presumptive *S. aureus* (log CFU/fish)

		Skin		Interior	
Time (days)		5°C	10°C	5°C	10°C
0[a]	BP + ET[e]	4.9 (0.1)[b]	4.9 (0.1)	4.9 (0.3)	4.9 (0.3)
	PFRSA	4.6 (0.3)[b]	4.6 (0.3)	4.8 (0.1)	4.8 (0.1)
5	BP + ET	N/A[c]	4.5, 4.7[e]	N/A	4.7, 4.9
	PFRSA	N/A	4.0, 4.6	N/A	4.6, 4.5
10	BP + ET	4.1, 4.0[d]	3.8, 4.0	4.0, 3.9	4.3, 4.7
	PFRSA	3.8, 3.6	3.6, 3.9	3.8, 4.0	3.1, 4.2

[a] Same data used at day 0 for 5°C and 10°C; n=3

[b] Mean of 3 samples (standard deviation in parentheses)

[c] Not analyzed

[d] Two samples analyzed, both results given

[e] BP + ET = Baird-Parker agar with egg yolk tellurite enrichment; PFRSA = Petrifilm Rapid *S. aureus* count plate

ther experiments at this temperature were not done.

At 5°C, numbers of both staphylococcal species decreased at least as much during 10 days at 5°C as they did during 10 days at 10°C (Table 2). Average decreases of 0.6 and 1.5 log units/fish (*S. epidermidis*) and 0.8 to 0.9 and 0.9 to 1.0 log CFU/g (*S. aureus*) occurred for skin and interior surfaces, respectively. In an earlier study using hot-smoked rainbow trout with water-phase salt levels of 4.9 to 6.1%, it was found that *S. epidermidis* numbers decreased by an average of 3.0 and 3.2 log units/fish during 10 days at 4 and 10°C, respectively *(16)*. The greater decreases observed in the earlier study probably reflect the higher salt content of the hot-smoked rainbow trout.

TABLE 3. Survival/growth of *Staphylococcus, Listeria monocytogenes,* and *Staphylococcus aureus* on the interior surfaces of hot-smoked fish during storage at 5 °C. Each value given is for a single sample analysis

Presumptive counts (log CFU/fish) on 1.8 kg lake trout

	S. epidermidis	*L. monocytogenes*	*S. aureus* enumerated on	
Time (days)			BP + ET[a]	PFRSA[a]
0	5.4, 5.6	5.4, 5.5	5.9, 5.8	5.7, 5.7
10	4.7, 4.9	6.1, 5.2	4.2, 5.0	4.3, 5.0
21	4.7, 4.4	9.3, 8.1	3.5, 3.5	3.9, 3.5

Presumptive counts (log CFU/fish) on 1.4 kg lake trout

	S. epidermidis	*L. monocytogenes*	*S. aureus* enumerated on	
Time (days)			BP + ET	PFRSA
0	5.2, 5.5	6.0, 6.0	5.8, 6.0	5.6, 5.9
10	4.9, 5.2	8.7, 6.7	5.1, 5.1	4.8, 5.1
21	4.7, 5.5	9.1, 9.3	5.1, 4.7	5.0, 5.1

Presumptive counts (log CFU/fish) on whitefish

	S. epidermidis	*L. monocytogenes*	*S. aureus* enumerated on	
Time (days)			BP + ET	PFRSA
0	5.3, 5.2	5.6, 6.0	5.7, 5.7	5.6, 5.5
10	4.4, 4.5	5.3, 5.6	5.0, 5.4	5.0, 5.3
21	4.0, 4.2	6.2, 6.8	4.7, 4.6	4.5, 4.5

Presumptive counts (log CFU/fish) on salmon

	S. epidermidis	*L. monocytogenes*	*S. aureus* enumerated on	
Time (days)			BP + ET	PFRSA
0	5.1, 5.1	5.9, 5.6	5.8, 5.7	5.8, 5.6
10	4.7, 4.6	5.0, 4.9	4.3, 4.7	4.3, 4.6
21	4.5, 4.5	6.2, 6.8	4.7, 4.6	4.0, 4.2

[a] BP + ET = Baird-Parker agar with egg yolk tellurite enrichment; PFRSA = Petrifilm Rapid *S. aureus* count plate

In the present study, there was considerably less growth of *L. monocytogenes* over 10 days at 5°C than at 10°C (Table 2). At 5°C, numbers of *L. monocytogenes* increased by 0.5 and 0.6 log units/fish for the skin and interior surfaces, respectively. All presumptive *L. monocytogenes* isolates (8 of 8) were confirmed by further testing. There was no apparent difference between the skin and interior surface of the chubs in terms of the growth/survival of any inoculum species. Since the skin is not eaten, only the interior surface was inoculated in the second experiment. Of the two methods for enumeration of *S. aureus*, the PFRSA method yielded slightly lower numbers (≤ 0.5 log units CFU/fish) than the BP + ET method. As reported elsewhere *(17)*, this difference may be the result of greater selectivity of the PFRSA method. Of 8 presumptive *S. aureus* isolates from BP + ET plates, 7 (87.5%) were confirmed as *S. aureus*. The unconfirmed isolate was identified as *S. epidermidis*. Isolates from PFRSA plates could not be tested because cells were inactivated during the testing for

thermostable DNAse. All 8 presumptive *S. epidermidis* isolates from the BP + MPRT were confirmed.

In the second experiment, which involved three different species of hot-smoked fish, all presumptive isolates of *S. epidermidis*, *L. monocytogenes*, and *S. aureus* (24 isolates per species) were confirmed. The trends seen in the first experiment were again apparent. The survival of *S. epidermidis* on the hot-smoked fish was poor, with average decreases of 1.0, 0.2, 1.2, and 0.6 log units/fish on 1.8 kg lake trout, 1.4 kg lake trout, whitefish, and salmon, respectively (Table 3). These decreases were considerably smaller than those observed on hot-smoked chubs in the first experiments or those observed previously on hot-smoked rainbow trout *(16)*. It is possible that greater decreases may occur in saltier hot-smoked fish or those that have had heavier applications of smoke.

On average, *L. monocytogenes* numbers increased during 21 days at 5°C by 3.2, 3.2, 0.7, and 0.8 log units/fish for 1.8 kg lake trout, 1.4 kg lake trout, whitefish, and salmon, respectively. Differences in *L. monocytogenes* growth between fish species may reflect differences in smoke component levels on the fish *(18)* or other compositional or processing differences. The observed growth of *L. monocytogenes* clearly points out the importance of preventing post-smoking *L. monocytogenes* contamination. The hazard associated with the presence of this pathogen may increase, by multiplication, during storage at 5 to 10°C, temperatures that may occur during distribution, despite being higher than the legal maximum. Other studies have shown that *L. monocytogenes* can multiply rapidly on cold-smoked fish *(8)* and hot-smoked fish *(11)* under refrigeration and moderately abusive conditions. Thus, smoked fish in general, regardless of the temperature of smoking, should be regarded as a potentially good growth substrate for this pathogen.

Numbers of *S. aureus* fell on all types of hot-smoked fish with average decreases of 2.4, 1.0, 1.0, and 1.0 log units/fish as measured using BP-ET agar for 1.8 kg lake trout, 1.4 kg lake trout, whitefish, and salmon, respectively. Corresponding average decreases measured using the PFRSA method were 2.0, 0.6, 1.0, and 1.6 log units/fish. Comparison of the two methods for each fish analyzed again suggested that the PFRSA method detected slightly lower numbers of *S. aureus*, although this difference was not apparent in the average values for each type of fish. Compared to the danger posed by *L. monocytogenes* contamination, the danger associated with contamination of hot-smoked fish by *S. aureus* appears low. This mesophilic pathogen did not grow under any of the conditions in either experiment and thus enterotoxin production would not occur. The temperatures in the two experiments were near or below the minimum growth temperature for *S. aureus (10)*. Thus, unless the hot-smoked fish were stored at considerably higher temperatures, enterotoxin production would not be expected to occur.

Collectively, the decreases in numbers of *S. epidermidis* and *S. aureus* suggest that use of staphylococci as an indicator of hand-to-food contact must be done early in the shelf life of hot-smoked fish to maximize the likelihood of detection. There is some risk that results of staphylococci enumerations on hot-smoked fish late in its shelf life could incorrectly suggest that hand-to-food contact had not occurred. Since survival of *S. aureus* was even poorer than that of *S. epidermidis*, detecting few or no staphylococci from stored hot-smoked fish plated on BP + MPRT would provide an accurate assessment of the risk of *S aureus* growth. However, it would be possible for few or no staphylococci to be detected on stored hot-smoked fish containing high numbers of *L. monocytogenes* that originated via manual contamination. Care must be taken to not assume that absence of staphylococci on freshly-made hot-smoked fish indicates the absence of *L. monocytogenes*. This pathogen may contaminate food via many non-manual sources, such as equipment and aerosols.

In summary, typical commercially hot-smoked fish do not appear to support the survival of *S. epidermidis* and *S. aureus* at 5 and 10°C, but *L. monocytogenes* will grow on these products at these temperatures. Thus, use of staphylococci as an indication of post-smoking hand-to-food contact must be done early in the shelf life of hot-smoked fish, before staphylococci die. Additional monitoring would be necessary to evaluate microbial contamination of hot-smoked fish via non-manual sources such as equipment surfaces.

ACKNOWLEDGMENTS

The authors gratefully acknowledge the laboratory assistance of Thomas J. Nack and Nicholas P. Schoeller.

REFERENCES

1. AOAC International. 1998. pp. 39.1.02, 46.5.02. Official methods of analysis of AOAC International, 16th edition, 4th revision, Volume II. P. Cunniff (ed). AOAC International, Gaithersburg, MD.
2. Dalgaard, P., and L.V. Jørgensen. 1998. Predicted and observed growth of *Listeria monocytogenes* in seafood challenge tests and in naturally contaminated cold-smoked salmon. Int. J. Food Microbiol. 40:105–115.
3. Dillon, R., T. Patel, and S. Ratnam. 1992. Prevalence of *Listeria* in smoked fish. J. Food Prot. 55:866–870.
4. Dillon, R., T. Patel, and S. Ratnam. 1994. Occurrence of *Listeria* in hot

and cold smoked seafood products. Int. J. Food Microbiol. 22:73–77.
5. Ericsson, H. A. Eklöw, M.-L. Danielsson-Tham, S. Loncarevic, L.-O. Mentzing, I. Persson, H. Unmerstad, and W. Tham. 1997. An outbreak of listeriosis suspected to have been caused by rainbow trout. J. Clin. Microbiol. 35:2904–2907.
6. Fuchs, R. S., and L. Nicolaides. 1994. Incidence of *Listeria* in hot- and cold-smoked fish. Lett. Appl. Microbiol. 19:394–396.
7. Heinitz, M. L., and J. M. Johnson. 1998. The incidence of *Listeria* spp., *Salmonella* spp., and *Clostridium botulinum* in smoked fish and shellfish. J. Food Prot. 61:318–323.
8. Hudson, J. A., and S. J. Mott. 1993. Growth of *Listeria monocytogenes*, *Aeromonas hydrophila*, and *Yersinia enterocolitica* on cold-smoked salmon under refrigeration and mild temperature abuse. Food Microbiol. 10:61–68.
9. Jabolonski, L. M., and G. A. Bohach. 1997. p. 353–377. *Staphylococcus aureus*. *In* M. P. Doyle, L. R. Beuchat, and T. J. Montville (eds.), Food Microbiology, Fundamentals and Frontiers. American Society for Microbiology Press, Washington, D. C., pp. 353–377.
10. Jay, J. M. 1992. Modern food microbiology, 4th edition. Chapman & Hall Ltd., New York.
11. Jemmi, T., and A. Keusch. 1992. Behavior of *Listeria monocytogenes* during processing and storage of experimentally contaminated hot-smoked trout. Int. J. Food Microbiol. 15:339–346.
12. Jørgensen, L. V., and H. H. Huss. 1998. Prevalence and growth of *Listeria monocytogenes* in naturally contaminated seafood. Int. J. Food Microbiol. 42:127–131.
13. Larson, E. 1985. Handwashing and skin: physiologic and bacteriologic aspects. Infect. Control 6:14–23.
14. Lina, G., F. Boutite, A. Tristan, M. Bes, J. Etienne, and F. Vandenesch. 2003. Bacterial competition for human nasal cavity colonization: role of staphylococcal *agr* alleles. Appl. Environ. Microbiol. 69:18–23.
15. Mead, P. S., L. Slutsker, V. Dietz, L. F. McCaig, J. S. Bresee, C. Shapiro, P. M. Griffin, and R. V. Tauxe. 1999. Food-related illness and death in the United States. Emerg. Infect. Dis. 5: 607–625.
16. Nack, T. J., K. A. Ewoldt, and S. C. Ingham. 2002. Potential use of staphylococci as indicators of post-heating contamination of hot-smoked fish. Dairy, Food Environ. Sanit. 22:526–533.
17. Schoeller, N. P., and S. C. Ingham. 2001. Comparison of the Baird-Parker agar and 3M™ Petrifilm™ rapid *S. aureus* count plate methods for detection and enumeration of *Staphylococcus aureus*. Food Microbiol. 18:581–587.
18. Slutsker, L., and A. Schuchat. 1999. Listeriosis in humans. pp. 75–95 *In* E. T. Ryser and E. H. Marth (eds.), *Listeria*, listeriosis, and food safety. Marcel Dekker, New York.
19. Wisconsin Administrative Code. 2001. Chapter ATCP 70, Food Processing Plants, paragraph 21. Register, Feb. 2001, No. 542, p. 367.

International Association for Food Protection®

Call for Nominations 2004 Secretary

A representative from education will be elected in March of 2004 to serve as IAFP Secretary for the year 2004-2005.

Send letters of nomination along with a biographical sketch to the Nominations Chairperson:

Samuel A. Palumbo
826 Havenshire Road
Naperville, Illinois 60565-6187
Phone: 708.563.8287
Fax: 708.563.1873
E-mail: palumbo@iit.edu

The Secretary-Elect is determined by a majority of votes cast through a mail vote taken in March of 2004. Official Secretary duties begin at the conclusion of IAFP 2004. The elected Secretary serves as a Member of the Executive Board for a total of five years, succeeding to President, then serving as Past President.

For information regarding requirements of the position, contact David Tharp, Executive Director, at 800.369.6337 or 515.276.3344; Fax: 515.276.8655; E-mail: dtharp@foodprotection.org.

Nominations close October 31, 2003.

International Association for Food Protection®

Award Nominations

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. To request nomination criteria, contact:

International Association for Food Protection
6200 Aurora Ave., Suite 200W
Des Moines, Iowa 50322-2864
Phone: 800.369.6337; 515.276.3344
Fax: 515.276.8655
Web site: www.foodprotection.org
E-mail: info@foodprotection.org

Nominations deadline is March 15, 2004. You may make multiple nominations. All nominations must be received at the IAFP office by March 15, 2004.

- Persons nominated for individual awards must be current IAFP Members. Black Pearl Award nominees must be companies employing current IAFP Members. NFPA 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 2004 – the Association's 91st Annual Meeting in Phoenix, Arizona on August 11, 2004.

Nominations will be accepted for the following Awards:

Black Pearl Award — Award Showcasing the Black Pearl

Presented in recognition of a company's outstanding achievement in corporate excellence in food safety and quality.

Sponsored by Wilbur Feagan and F&H Food Equipment Company

Fellow Award — Distinguished Plaque

Presented to Member(s) who have contributed to IAFP and its Affiliates with quiet distinction over an extended period of time.

Honorary Life Membership Award — Plaque and Lifetime Membership in IAFP

Presented to Member(s) for their devotion to the high ideals and objectives of IAFP and for their service to the Association.

Harry Haverland Citation Award — Plaque and $1,000 Honorarium

Presented to an individual for years of devotion to the ideals and objectives of IAFP.

Sponsored by Silliker Inc.

Harold Barnum Industry Award — Plaque and $1,000 Honorarium

Presented to an individual for outstanding service to the public, IAFP and the food industry.

Sponsored by NASCO International, Inc.

Educator Award — Plaque and $1,000 Honorarium

Presented to an individual for outstanding service to the public, IAFP and the arena of education in food safety and food protection.

Sponsored by Nelson-Jameson, Inc.

Sanitarian Award — Plaque and $1,000 Honorarium

Presented to an individual for outstanding service to the public, IAFP and the profession of the Sanitarian.

Sponsored by Ecolab, Inc., Food and Beverage Division

Maurice Weber Laboratorian Award — Plaque and $1,000 Honorarium

Presented to an individual for outstanding contributions in the laboratory, recognizing a commitment to the development of innovative and practical analytical approches in support of food safety.

Sponsored by Weber Scientific

International Leadership Award — Plaque, $1,000 Honorarium and Reimbursement to attend IAFP 2004

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.

Sponsored by Unilever

NFPA Food Safety Award — Plaque and $3,000 Honorarium

This Award alternates between individuals and groups or organizations. In 2004, the award will be presented to a group or organization in recognition of a long history of outstanding contributions to food safety research and education.

Sponsored by National Food Processors Association

Call for Abstracts

IAFP 2004

The Association's 91st Annual Meeting

August 8-11, 2004

Phoenix, Arizona

General Information

1. Complete the Abstract Submission Form.
2. All presenters must register for the Annual Meeting and assume responsibility for their own transportation, lodging, and registration fees.
3. There is no limit on the number of abstracts registrants may submit. However, presenters must present their presentations.
4. Accepted abstracts will be published in the Program and Abstract Book. Editorial changes will be made to accepted abstracts at the discretion of the Program Committee.
5. Photocopies of the abstract form may be used.
6. Membership in the Association is not required for presenting a paper at IAFP 2004.

Presentation Format

1. Technical — Oral presentations will be scheduled with a maximum of 15 minutes, including a two to four minute discussion. LCD projectors will be available.
2. Poster — Freestanding boards will be provided for presenting posters. Poster presentation surface area is 4' high by 8' wide. Handouts may be used, but audiovisual equipment will not be available. The presenter will be responsible for bringing pins and velcro.

Note: The Program Committee will make the final decision on presentation format.

Instructions for Preparing Abstracts

1. Title — The title should be short but descriptive. The first letter in each word in the title and proper nouns should be capitalized.
2. Authors — List all authors using the following style: first name followed by the surname.
3. Presenter Name & Title — List the full name and title of the person who will present the paper.
4. Presenter Address — List the name of the department, institution and full postal address (including zip/postal code and country).
5. Phone Number — List the phone number, including area, country, and city codes of the presenter.
6. Fax Number — List the fax number, including area, country, and city codes of the presenter.
7. E-mail — List the E-mail address for the presenter.
8. Format preferred — Check the box to indicate oral or poster format. The Program Committee makes the final decision on the format of the abstract.
9. Category — Check the box to indicate which category best fits the subject of the abstract.
10. Developing Scientist Awards Competitions — Check the box to indicate if the paper is to be presented by a student in this competition. A signature and date is required from the major professor or department head. See "Call for Entrants in the Developing Scientist Awards Competitions."
11. Abstract — Type abstract, double-spaced, in the space provided or on a separate sheet of paper, using a 12-point font size. Use no more than 250 words.

Abstract Submission

Abstracts submitted for IAFP 2004 will be evaluated for acceptance by the Program Committee. Please be sure to follow the format instructions above carefully; failure to do so may result in rejection. Information in the abstract data must not have been previously published in a copyrighted journal.

Abstracts must be received no later than January 5, 2004. Return the completed abstract form through one of the following methods:

1. Online: Use the online abstract submission form located at www.foodprotection.org. You will receive an E-mail confirming receipt of your submission.
2. E-mail: Submit via E-mail as an attached text or MS Word™ document to abstracts@foodprotection.org.

Selection Criteria

1. Abstracts must accurately and briefly describe:
   (a) the problem studied and/or objectives;
   (b) methodology;
   (c) essential results; and
   (d) conclusions and/or significant implications.
2. Abstracts must report the results of original research pertinent to the subject matter. Papers should report the results of applied research on: food, dairy and environmental sanitation; foodborne pathogens; food and dairy microbiology; food and dairy engineering; food and dairy chemistry; food additives and residues; food and dairy technology; food service and food administration; quality assurance/control; mastitis; environmental health; waste management and water quality. Papers may also report subject matter of an educational and/or nontechnical nature.
3. Research must be based on accepted scientific practices.
4. Research should not have been previously presented nor intended for presentation at another scientific meeting. Papers should not appear in print prior to the Annual Meeting.
5. Results should be summarized. Do not use tables or graphs.

Rejection Reasons

1. Abstract was not prepared according to the "Instructions for Preparing Abstracts."
2. Abstract does not contain essential elements as described in "Selection Criteria."
3. Abstract reports inappropriate or unacceptable subject matter or is not based on accepted scientific practices, or the quality of the research or scientific approach is inadequate.
4. Work reported appears to be incomplete and/or data are not presented. Indication that data will be presented is not acceptable.
5. Abstract was poorly written or prepared. This includes spelling and grammatical errors.
6. Results have been presented/published previously.
7. Abstract was received after the deadline for submission.
8. Abstract contains information that is in violation of the International Association for Food Protection Policy on Commercialism.

Projected Deadlines/Notification

Abstract Submission Deadline: January 5, 2004. Submission Confirmations: On or before January 6, 2004. Acceptance/Rejection Notification: February 13, 2004.

Contact Information

Questions regarding abstract submission can be directed to Bev Corron, 515.276.3344 or 800.369.6337; E-mail: bcorron@foodprotection.org.

Program Chairperson

Gary Acuff
Texas A & M University
Department of Animal Science
2471 TAMU
College Station, TX 77843-2471
Phone: 979.845.4402
Fax: 979.845.9354
E-mail: gacuff@tamu.edu

Abstract Form

DEADLINE: Must be Received by January 5, 2004

(1) Title of Paper _____

_____

(2) Authors _____

_____

(3) Full Name and Title of Presenter _____

_____

(4) Institution and Address of Presenter _____

_____

(5) Phone Number _____

(6) Fax Number _____

(7) E-mail _____

(8) Format preferred: ☐ Oral ☐ Poster ☐ No Preference

The Program Committee will make the final decision on presentation format.

(9) Category: ☐ Produce ☐ Foods of Animal Origin ☐ Seafood ☐ Other Food Commodities

☐ Risk Assessment ☐ Education ☐ General Microbiology and Sanitation

☐ Antimicrobials ☐ Pathogens

(10) Developing Scientist Awards Competition ☐ Yes Graduation date _____

Major Professor/Department Head approval (signature and date) _____

(11) TYPE abstract, DOUBLE-SPACED, in the space provided or on a separate sheet of paper, using a 12-point font size. Use no more than 250 words.

Call for Entrants in the Developing Scientist Awards Competitions

Supported by the International Association for Food Protection Foundation

The International Association for Food Protection is pleased to announce the continuation of its program to encourage and recognize the work of students and recent graduates in the field of food safety research. Qualified individuals may enter either the oral or poster competition.

Purpose

1. To encourage students and recent graduates to present their original research at the Annual Meeting.
2. To foster professionalism in students and recent graduates through contact with peers and professional Members of the Association.
3. To encourage participation by students and recent graduates in the Association and the Annual Meeting.

Presentation Format

Oral Competition – The Developing Scientist Oral Awards Competition is open to graduate students (enrolled or recent graduates) from M.S. or Ph.D. programs or undergraduate students at accredited univesities or colleges. Presentations are limited to 15 minutes, which includes two to four minutes for discussion.

Poster Competition – The Developing Scientist Poster Awards Competition is open to students (enrolled or recent graduates) from undergraduate or graduate programs at accredited universities or colleges. The presenter must be present to answer questions for a specified time (approximately two hours) during the assigned session. Specific requirements for presentations will be provided at a later date.

General Information

1. Competition entrants cannot have graduated more than a year prior to the deadline for submitting abstracts.
2. Accredited universities or colleges must deal with environmental, food or dairy sanitation, protection or safety research.
3. The work must represent original research completed and presented by the entrant.
4. Entrants may enter only one paper in either the oral or poster competition.
5. All entrants must register for the Annual Meeting and assume responsibility for their own transportation, lodging, and registration fees.
6. Acceptance of your abstract for presentation is independent of acceptance as a competition finalist. Competition entrants who are chosen as finalists will be notified of their status by the chairperson by May 28, 2004.
7. All entrants with accepted abstracts will receive a complimentary, one-year Student Membership. This membership will entitle you to receive *JFP* Online.
8. In addition to adhering to the instruction in the "Call for Abstracts," competition entrants must check the box to indicate if the paper is to be presented by a student in this competition. A signature and date is required from the major professor or department head.

Judging Criteria

A panel of judges will evaluate abstracts and presentations. Selection of up to five finalists for each competition will be based on evaluations of the abstracts and the scientific quality of the work. All entrants will be advised of the results by May 28, 2004. Only competition finalists will be judged at the Annual Meeting and will be eligible for the awards.

All other entrants with accepted abstracts will be expected to be present as part of the regular Annual Meeting. Their presentations will not be judged and they will not be eligible for the awards.

Judging criteria will be based on the following:

1. Abstract – clarity, comprehensiveness and conciseness.
2. Scientific Quality – Adequacy of experimental design (methodology, replication, controls), extent to which objectives were met, difficulty and thoroughness of research, validity of conclusions based upon data, technical merit and contribution to science.
3. Presentation – Organization (clarity of introduction, objectives, methods, results and conclusions), quality of visuals, quality and poise of presentation, answering questions, and knowledge of subject.

Finalists

Awards will be presented at the International Association for Food Protection Annual Meeting Awards Banquet to the top three presenters (first, second and third places) in both the oral and poster competitions. All finalists are expected to be present at the banquet where the awards winners will be announced and recognized.

Awards

First Place – $500 and an engraved plaque
Second Place – $ 300 and a framed certificate
Third Place – $100 and a framed certificate

Award winners will receive a complimentary, one-year Student Membership including *Food Protection Trends*, *Journal of Food Protection*, and *JFP* Online.

Policy on Commercialism

for Annual Meeting Presentations

1. INTRODUCTION

No printed media, technical sessions, symposia, posters, seminars, short courses, and/or other related types of forums and discussions offered under the auspices of the International Association for Food Protection (hereafter referred to as to Association forums) are to be used as platforms for commercial sales or presentations by authors and/or presenters (hereafter referred to as authors) without the express permission of the staff or Executive Board. The Association enforces this policy in order to restrict commercialism in technical manuscripts, graphics, oral presentations, poster presentations, panel discussions, symposia papers, and all other type submissions and presentations (hereafter referred to as submissions and presentations), so that scientific merit is not diluted by proprietary secrecy.

Excessive use of brand names, product names or logos, failure to substantiate performance claims, and failure to objectively discuss alternative methods, processes, and equipment are indicators of sales pitches. Restricting commercialism benefits both the authors and recipients of submissions and presentations.

This policy has been written to serve as the basis for identifying commercialism in submissions and presentations prepared for the Association forums.

2. TECHNICAL CONTENT OF SUBMISSIONS AND PRESENTATIONS

2.1 Original Work

The presentation of new technical information is to be encouraged. In addition to the commercialism evaluation, all submissions and presentations will be individually evaluated by the Program Committee chairperson, technical reviewers selected by the Program Committee chairperson, session convenor, and/or staff on the basis of originality before inclusion in the program.

2.2 Substantiating Data

Submissions and presentations should present technical conclusions derived from technical data. If products or services are described, all reported capabilities, features or benefits, and performance parameters must be substantiated by data or by an acceptable explanation as to why the data are unavailable (e.g., incomplete, not collected, etc.) and, if it will become available, when. The explanation for unavailable data will be considered by the Program Committee chairperson and/or technical reviewers selected by the Program Committee chairperson to ascertain if the presentation is acceptable without the data. Serious consideration should be given to withholding submissions and presentations until the data are available, as only those conclusions that might be reasonably drawn from the data may be presented. Claims of benefit and/or technical conclusions not supported by the presented data are prohibited.

2.3 Trade Names

Excessive use of brand names, product names, trade names, and/or trademarks is forbidden. A general guideline is to use proprietary names once and thereafter to use generic descriptors or neutral designations. Where this would make the submission or presentation significantly more difficult to understand, the Program Committee chairperson, technical reviewers selected by the Program Committee chairperson, session convenor, and/or staff, will judge whether the use of trade names, etc., is necessary and acceptable.

2.4 "Industry Practice" Statements

It may be useful to report the extent of application of technologies, products, or services; however, such statements should review the extent of application of all generically similar technologies, products, or services in the field. Specific commercial installations may be cited to the extent that their data are discussed in the submission or presentation.

2.5 Ranking

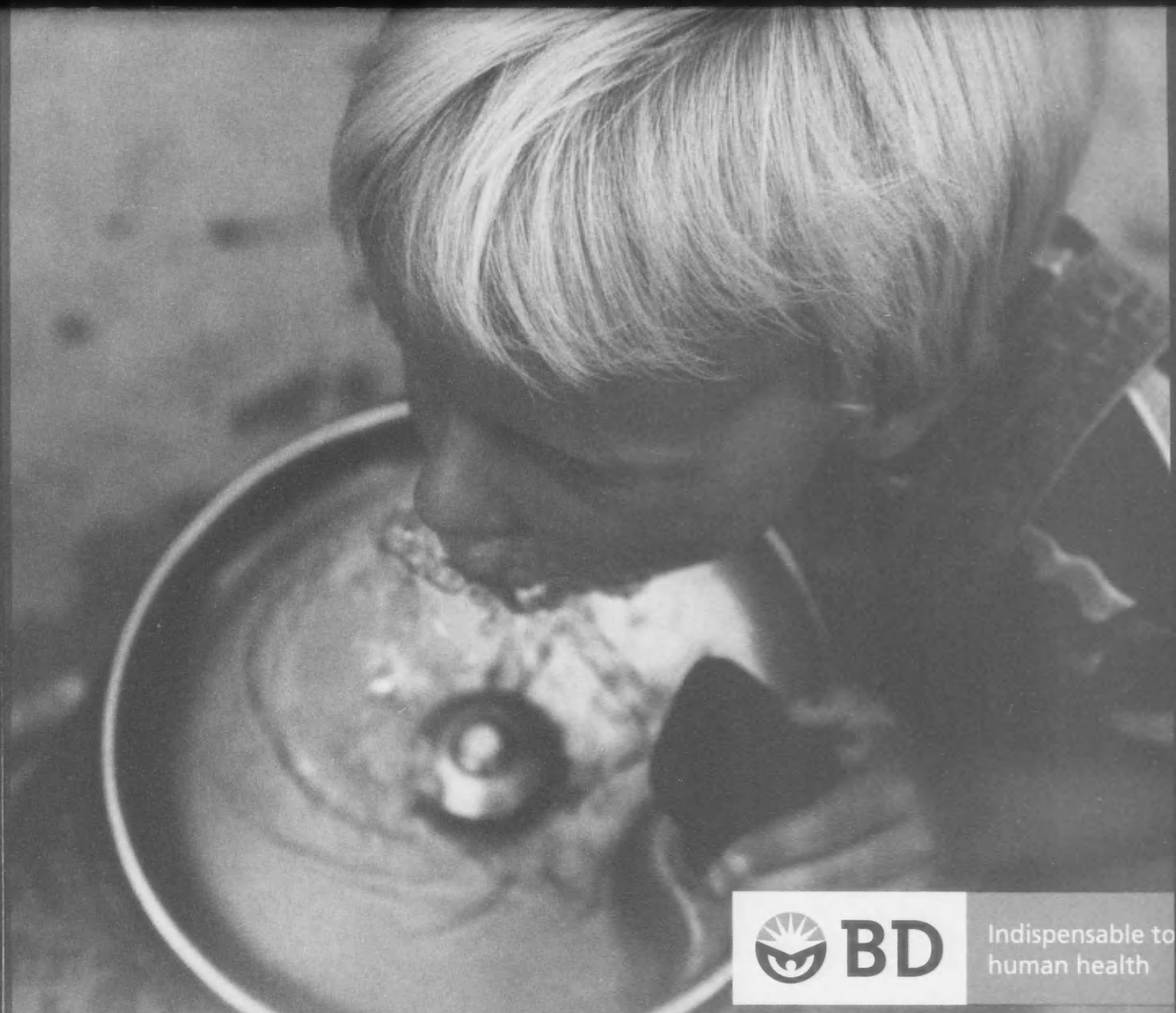
Although general comparisons of products and services are prohibited, specific generic comparisons that are substantiated by the reported data are allowed.

2.6 Proprietary Information (See also 2.2.)

Some information about products or services may not be publishable because it is proprietary to the author's agency or company or to the user. However, the scientific principles and validation of performance parameters must be described for such products or services. Conclusions and/or comparisons may be made only on the basis of reported data.

2.7 Capabilities

Discussion of corporate capabilities or experiences are prohibited unless they pertain to the specific presented data.



BD

Indispensable to human health

Clear-Cut Test Results for Our Most Valuable Resource

BD introduces three **NEW** Chromogenic Water Testing Media:

- MI Agar
- Modified mTEC Agar
- mEI Agar

–Low false-positive and false-negative rates

–Final results in 24 hours or less

–Single membrane technique—no membrane filter transfers required

–All formulations conform to USEPA approved methods

BD Diagnostic Systems
7 Loveton Circle
Sparks, MD 21152-0999 USA
800.638.8663
www.bd.com/industrial

NEW MEMBERS

BARBADOS

Edward B. Massiah
Hipac Ltd., Bridgetown

CANADA

Anas A. Al-Nabulsi
University of Manitoba
Winnipeg, Manitoba

Paul F. Baxter
Schneider Foods
Kitchener, Ontario

Irene M. Mentis
Canadian Food Inspection Agency
Scarborough, Ontario

Mario Ouellon
Bariatrix International Inc.
Lachine, Quebec

Gloria L. Pennycook
DuPont Canada, Inc.
Mississauga, Ontario

George A. Rice
Fraser Health Authority
Hope, British Columbia

Trevor States
Costco Wholesale
Ottawa, Ontario

Jerome Woynarski
BC Hot House Foods, Inc.
Surrey, British Columbia

FINLAND

Pekka K. Pakkala
National Food Agency
Helsinki

Mika J. Tuomola
Raisio Life Sciences
Raisio

FRANCE

Stefano Colombo
Silliker bioMérieux
Paris

GREECE

Panagiotis Skandamis
Agricultural University of Athens
Kallithea, Athens

ISRAEL

David Rosenblatt
The Standards Institute of Israel
Tel-Aviv

MEXICO

Maria Del Carmen Rabiela
ESDAI Universidad Panamericana
Mexico City

Covadonga Torre
ESDAI Universidad Panamericana
Mexico City

SOUTH KOREA

Sang-Do Ha
Chung-Ang University
Ansung-Si, Gyunggi-Do

Zheng-you Yang
Gyeongsang National University
Chinju, Gyeongnam

Kwang-Ro Yoon
Chung-Ang University
Ansung-Si, Gyunggi-Do

THAILAND

Prachak Poomvises
Chakmartin Intervirontech Ltd.
Bangkok

UNITED KINGDOM

John L. Basset
Unilever
Bedford, Bedfordshire

Leanne Ellis
University of Wales Institute-Cardiff
Cardiff, South Wales

Richard C. Hayes
University of Wolverhampton
Wolverhampton

David Wareing
Dynal Biotech, Inc.
Preston

UNITED STATES

ALABAMA

Jordan W. Bowers
Auburn University
Auburn

Debra L. Byrd
Alabama A&M University
Huntsville

Wendy Lang
Alabama A&M University
Normal

ARKANSAS

Chris W. Coleman
Safe Foods Corporation
North Little Rock

CALIFORNIA

Michael B. Cooley
USDA/ARS, Albany

Lon Doty
FOODSAFE Systems, Inc.
South San Francisco

NEW MEMBERS

Denise M. Foley
Chapman University
Orange

Prakash R. Patil
Central Valley Cheese
Turlock

Nela J. Romo
El Pollo Loco, West Covina

COLORADO

Jessica M. Cannon
Boulder Co. Health Dept.
Boulder

CONNECTICUT

Hector M. Haas
Dept. of the Army
Groton

DELAWARE

Doris T. Hicks
University of Delaware
Lewes

DISTRICT OF COLUMBIA

Shari L. Rolando
Association of Public Health Laboratories, Washington

Jan C. Singleton
USDA/CSREES, Washington

Felix J. Spinelli
USDA/FSIS/OPPD/RDD
Washington

FLORIDA

Daniel Coto
EHA Consulting Group, Inc.
Tampa

Arthur F. Dunham
Pinellas County Schools
Palm Harbor

Roberta M. Hammond
Florida Dept. of Health
Tallahassee

Frank Hatcher
Environmental Health Testing
Orlando

Kathy Henry
Environmental Health Testing
Orlando

Yuelian Shen
Florida Dept. of Agriculture & Consumer Svcs, Tallahassee

GEORGIA

David S. Gottfried
Georgia Tech Research Institute
Atlanta

HAWAII

Stacy M. Yamamoto
CENPAC Dvc
Fort Shafter

ILLINOIS

Jayne A. Nosari
Illinois Dept. of Public Health
Springfield

Catherine J. Reynolds
Silliker, Inc., Homewood

Gillaume Touvet
Chiappetti Wholesale Meat Co.
Chicago

INDIANA

Paul M. Druley
Holy Cross College
South Bend

Daniel M. Khali
Purdue University
West Lafayette

Steven H. Sassaman
Pri-Pak Inc., Lawrenceburg

W. E. Spindler
Wayne Chemical Co.
Fort Wayne

IOWA

James W. Stevens
Maytag Dairy Farms
Newton

KANSAS

Lisa A. Borgmann
USDA/FSIS
Perry

Buffy A. Stohs
Kansas State University
Manhattan

MAINE

Darrell W. Donahue
University of Maine
Orono

MARYLAND

Melanie Bjork
Applebee's International
Overland Park

Antonio J. De Jesus
US Food and Drug Administration
College Park

Yaguang Luo
USDA
Beltville

Iris E. Valentin-Bon
FDA/CFSAN
College Park

MASSACHUSETTS

Emmanouil Apostolidis
University of Massachusetts
Amherst

William K. Shaw, Jr.
University of Massachusetts
Amherst

NEW MEMBERS

MICHIGAN

Arzu Cagri
Michigan State University
Lansing

Nancy Culotta
NSF International
Ann Arbor

Joseph M. Madden
Neogen Corporation
Lansing

MINNESOTA

Sophia C. Czechowicz
3M Microbiology
St. Paul

Cynthia D. Zook
3M Microbiology
St. Paul

MISSISSIPPI

Farid M. Balaa
USDA, Mississippi State

Chonthida Kaewplang
Mississippi State University
Starkville

John M. McGillivray
Mississippi State University
Mississippi State

Chad B. Robertson
Mississippi State University
Mississippi State

Juan L. Silva
Mississippi State University
Mississippi State

Jelena Stojanovic
Mississippi State University
Mississippi State

MISSOURI

Patricia Booth
bioMérieux, Inc.
Hazelwood

John Bosland
bioMérieux, Inc.
Hazelwood

Randy Casey
bioMérieux, Inc.
Hazelwood

Chris Crawford
bioMérieux, Inc.
Hazelwood

Dennis D'Alfonso
bioMérieux, Inc.
Hazelwood

Mary Ann Goris
Schnuck Markets, Inc.
St. Louis

John Moller
bioMérieux, Inc.
Hazelwood

Terri Pontious
bioMérieux, Inc.
Hazelwood

Cheri Smith
Jefferson Co. Health Dept.
Hillsboro

NEBRASKA

Robert E. Peterson
University of Nebraska-Lincoln
Lincoln

John H. Rupnow
University of Nebraska-Lincoln
Lincoln

Andres Vargas
University of Nebraska-Lincoln
Lincoln

NEW HAMPSHIRE

Kimberly J. Onett
Sushi Mari Hanna SM
Plaistow

NEW YORK

Carolyn M. Mayerhauser
Pepsi Cola Co.
Valhalla

Daniel A. Seigerman
Cornell University
Roslyn

NORTH CAROLINA

Yolanda M. Harrison
Avendra
Charlotte

Hong Yang
North Carolina State University
Raleigh

OHIO

Hussein M. Mohamed
Ohio State University
Columbus

Michael J. Warden
Cargill Inc.
Sidney

OKLAHOMA

Margo E. Kendall
BioCheck Corporation
Oklahoma City

Ross C. Walker
Oklahoma State University
Oklahoma City

PENNSYLVANIA

Pyong U. Roh
Fort Washington

Joan M. Skillin
Sussex Co. Dept. of Health
Dingmans Ferry

NEW MEMBERS

Fay B. Strickler
Penn State Cooperative Exension
Leesport

Morgan Wallace
UDA/ARS
Wyndmoor

PUERTO RICO

Stella Andino
Hershey Puerto Rico, Inc.
Las Piedras

SOUTH CAROLINA

Randy A. Cable
The BOC Group
Mount Pleasant

Terry C. Williams
DHEC
Irmo

TENNESSEE

Joy D. Haller
Cracker Barrel Old Country Store
Lebanon

Virginia E. Hoban
Level Valley Creamery, Inc.
Gainesboro

Min Huang
The University of Tennessee
Knoxville

Jacob H. Stevens
The University of Tennessee
Knoxville

TEXAS

Betsy L. Booren
Texas A&M University
College Station

Courtney Halbrook
Brinker International
Dallas

Kristina A. Harris
Texas Tech University
Lubbock

James R. Heil
HEB Grocery Co.
Rockport

Jose Gabriel Rodriguez
Texas A&M University
Houston

Sasi Vadlamudi
Texas A&M University
College Station

VIRGINIA

Tatiana A. Lorca
Virginia Tech
Blacksburg

WASHINGTON

Suzanne Schreck
Marler Clark LLP, PS
Seattle

Patti Waller
Marler Clark LLP, PS
Seattle

WISCONSIN

Amy S. Fox
AgeAdvantAge, Inc.
Madison

UPDATES

Thomas J. Gruetzmacher Named Vice President for Land O'Lakes

Thomas Gruetzmacher has been named vice president of dairy foods research and development for Land O'Lakes. Gruetzmacher has over 25 years of experience in dairy research, including executive positions at Dean Foods Company. Most recently, he served as commercial technology director for Kerry, Inc. Gruetzmacher has held leadership roles with the Associated Illinois Milk, Food and Environmental Sanitarains, IFT, and ADSA.

New Chief Executive for Food Safety Authority of Ireland

The Food Safety Authority of Ireland has announced that Ann Westby has been appointed chief executive of the Food Safety Authority of Ireland and will take up office in early October. Ms. Westby is currently technical and corporate affairs manager with Nestlé Ireland. She has over 30 years experience in the food industry having held a number of technical and managerial positions in Nestlé Ireland.

Ms. Westby is a member of a number of food science professional bodies including the Institute of Food Science and Technology UK, past president and fellow of the Institute of Food Science and Technology of Ireland, and past chairman and honorary fellow of the Irish Society of Food Hygiene Technology.

In addition, Ms. Westby is currently involved in a range of professional activities, including her role as chairman of the Regulatory and Technical Group in IBEC, and membership of Teagasc Industry Group on Training. She is also a member of the working group with the Department of Agriculture & Food dealing with the Food Institutional Research Measure (FIRM), this measure provides a framework for research in generic technologies supporting innovation and development in the Irish food industry.

Organic Valley Appoints Four New Sales Managers

Mark Zurek has joined the Organic Valley sales management team as the regional manager for the New York Metro, Philadelphia and Washington, D.C. markets.

In the food broker business for 22 years, Zurek most recently served as senior account manager of Paul G. Nester & Son Company. Prior to that post, he was a senior account executive with the Joseph W. Riley Company that became a part of Crossmark in 2000.

Jack Lee will be the regional manager for the Northwestern United States. A 25-year veteran of the organic and natural food business, Lee most recently served as vice president of the Natural Foods Division of Advantage Sales and Marketing. Prior to that post, he was co-owner and retail sales manager of Northwest Specialties, an organic and natural foods brokerage that became a part of Advantage in 1999. His previous positions were in sales for ID Wares, a food service operation, Port Townsend Baking Company, a whole grains bakery, and Community Produce, a cooperative that eventually became part of Mountain Peoples Warehouse.

Douglas Hanson has been promoted to division sales manager. Douglas is an industry all star with more than 20 years experience in food sales, including positions with brokerage companies, distributors and manufacturers. Hanson will be responsible for executing Organic Valley's national sales plan within the western United States for both the mass market and natural foods classes of trade. He also oversees the sales activities in the division's four regions. This includes the development of annual sales and expenses budgets, promotional activity, new product launches and overall distribution gains.

John Morrissey has been promoted to Eastern division sales manager. Morrissey served previously as Organic Valley's Northeast regional sales manager. John will be responsible for expanding divisional sales and distribution of the Organic Valley branded products including organic milk, juices, eggs, butter, cheese and meats. He manages four regional sales managers who cover New England, New York, Washington, D.C., and the Southeast and the Midwest.

International Association for Food Protection® NEWS

Web Site Offers Information, Insight on Foodborne Illnesses

Whether it's potato salad left out in the sun, hamburger that has seen better days, or a steak that wasn't cooked enough, a long holiday weekend can create some gastrointestinal problems if you're not careful.

If you find yourself suffering from what you think is a foodborne illness, there's a Web site that can not only offer you some help, but also help health officials determine if there is a public health problem to consider.

Developed by the Michigan State University National Food Safety and Toxicology Center (NFSTC), the Web site is at www.RUSick2.msu.edu. People who are experiencing sudden vomiting and diarrhea — strong symptoms of food poisoning — can go to the Web site to see if others have reported eating the same foods or are experiencing the same symptoms.

"This brings food poisoning victims together and lets them compare notes," said Holly Wethington, an MSU graduate student who is managing the project. Believed to be the first of its kind in the nation, the Web site allows users to fill out an online survey to determine how many other forum users with the same symptoms ate the same foods from the same source at the same time.

The survey has been adapted to take as long as the visitor wishes — he or she can enter just symptoms, or continue and enter a food history, and maybe even food sources, if time permits.

"Before, no one knew if they were part of a cluster," said Paul Bartlett, a professor in the NFSTC who developed the site. "Many people automatically blame their last restaurant. In most instances, the forum will help convince people who are ill that they are not part of a foodborne outbreak cluster."

Originally launched in November 2002, the Web site was designed to detect clusters of suspected food poisoning cases in Michigan's Ingham, Eaton and Clinton counties. Since then, the site has expanded its scope.

"Since visitors were coming in from all over Michigan, it made sense to expand the efforts of the project," Wethington said. "Advertising on Google began in April and now the forum is getting visitors from all over the country."

The RUSick2 project is funded by a $600,000 grant from the Michigan Life Sciences Corridor.

Also involved in the project are epidemiologists from the Michigan Department of Community Health, Michigan Department of Agriculture, the University of Michigan and several local health departments.

Symptoms of foodborne illness can include nausea, diarrhea and abdominal cramps. Stomach and abdominal pain, cramps and spasms are the number one reason people go to a hospital emergency room or urgent care clinic.

In 2001, Michigan had 192 outbreaks of foodborne illnesses, affecting more than 1,700 people.

There are an estimated 76 million foodborne illnesses and as many as 5,000 deaths every year in the United States, according to the Centers for Disease Control and Prevention.

Former Secretary of State James Baker III to Open Worldwide Food Expo '03

Former US Secretary of State, James Baker III will deliver the opening general session, "A Conversation with James Baker: World Politics, Economics and Today's Business Environment," at Worldwide Food Expo '03, October 29, 2003.

Mr. Baker served as US Secretary of State from 1989 to 1992 under President George H. W. Bush; and as White House Chief of Staff, and later as US Secretary of the Treasury, during the Reagan Administration. As Treasury Secretary he served as chairman of the President's Economic Policy Council.

ARS Scientists May Bring Relief to Peanut Allergy Sufferers

Americans reach for peanuts at baseball games, picnics and in between meals. Savory and satisfying, peanuts pack a nutritional punch in the form of protein, fiber, vitamin E, niacin and folic acid. But not everyone can enjoy the popular legumes, for peanuts induce an allergic reaction in 1.5 million Americans.

Now Agricultural Research Service scientists are bringing hope to peanut-sensitive consumers in

the form of a hypoallergenic peanut. Soheila J. Maleki and her colleagues at the agency's Southern Regional Research Center (SRRC) in New Orleans, LA, have found a peanut variety lacking one of the major peanut allergens. If their search turns up another allergen-free variety, researchers can cross-breed them to produce a safer nut.

Maleki's peanut allergy work is being presented at a news conference, by phone, hosted by the American Academy of Allergy, Asthma and Immunology.

To find a friendlier nut, scientists needed a diverse supply of peanut plants to screen. So, SRRC researchers obtained 300 peanut varieties from a collection at North Carolina State University. Maleki and her colleagues then developed antibodies against the three main peanut allergens to determine if any of the varieties were missing the allergy-causing components. Using the ARS antibodies, they found what they had hoped for: a peanut variety lacking a key allergen.

Varieties showing lower levels of allergens can be used in traditional cross-breeding experiments to produce a hypoallergenic peanut plant. Along with new peanut processing methods and vaccine development in the works, a cultivar with reduced allergens could be the answer peanut allergy sufferers have long been awaiting.

New Database Helps Control Food Pathogens

The Agricultural Research Service's Eastern Regional Research Center (ERRC), the U.K. Institute of Food Research (IFR) and the U.K. Food Standards Agency recently announced the joint production of a combined database (ComBase) of Predictive Microbiology.

The scientific field of Predictive Microbiology focuses on the development of mathematical models to predict the behavior of microbes in various environments. Underlying these models are vast quantities of laboratory data that describe microbial growth, persistence and death under diverse environmental conditions, such as those encountered in the production, processing, and handling of food.

Although much data about microbial behavior are available in various formats, such as in the published literature, in private reports and in laboratory notebooks, they must be systematically collected and organized to efficiently search and retrieve data for the development of predictive models. Currently containing more than 20,000 data sets, ComBase meets this challenge.

Additional information about ComBase is available from the U.K. Institute of Food Research at http://www.ifr.ac.uk/combase/.

On-farm Food Safety Videos on the Web

A series of practical, on-farm food safety videos featuring Farmer Jeff Wilson and a bevy of surprise guests is available from the Food Safety Network.

For example, in the first, short video Farmer Jeff describes the hidden complexities behind maintaining a good crop of strawberries, as well as what measures are implemented to ensure the he delivers safe food to the consuming public.

In episode 4 Farmer Jeff gets a visit from Amber Luedtke of AIMS (Agricultural Integrated Management Services). She collects some lettuce to test for micribiological hazards, and also talks about what steps are taken at Birkbank Farms to ensure safe food, including the training Farmer Jeff's workers receive.

New videos concerning various aspects of food safety and agricultural technology are posted weekly until the end of the growing season.

For more information, visit http://www.foodsafety-network.ca/bt-sweet-corn/bt-index.htm.

Federal Regulations Amended to Enhance BSE Controls

The Government of Canada took another major step in further protecting Canada's food supply and reducing the risk of Canadians becoming exposed to the agent that may transmit BSE. The Government of Canada has amended the Food and Drug Regulations and the Health of Animals Regulations to prevent specified risk material (SRM) from entering the human food supply. This follows a July 18th announcement by Health Minister Anne McLellan and Agriculture and Agri-Food Minister Lyle Vanclief of the additional measures the federal government is taking to enhance bovine spongiform encephalopathy (BSE) controls. In BSE-infected cattle, the infective agent is concentrated in tissues such as the brain and spinal cord. Studies have indicated a potential link between the consumption of certain tissues containing abnormal prion proteins from infected cattle and the incidence of variant Creutzfeldt-Jakob Disease (vCJD), the human equivalent of BSE.

These regulations establish a definition for SRM and prohibit the sale or import for sale of food products containing SRM under the Food and Drug Regulations from

countries that are not BSE-free. The amendments to the Health of Animals Regulations will require the removal of SRM from carcasses and prohibit the export and use of SRM in food for human consumption. SRM are defined as the skull, brain, trigeminal ganglia (nerves attached to the brain), eyes, tonsils, spinal cord and dorsal root ganglia (nerves attached to the spinal cord) of cattle aged 30 months or older (scientific research has shown that these tissues, in cattle younger than 30 months, do not contain the infective agent); and the distal ileum (portion of the small intestine) of cattle of all ages.

The effective date for these regulations is August 23, 2003. However, in federally-registered establishments, a CFIA directive will require SRM removal immediately.

These regulations reflect the Government of Canada's commitment to strengthening Canada's BSE measures and to protecting the health of Canadians and consumers of Canadian beef.

Cross Talk between Bacteria, Host Leads to *E. coli* Infection

A strain of *E. coli* that causes severe, sometimes deadly, intestinal problems relies on signals from beneficial human bacteria and a stress hormone to infect human cells, a researcher at UT Southwestern Medical Center at Dallas has discovered.

"The finding, which will appear online in Proceedings of the National Academy of Sciences, could lead to the development of beta blockers as a therapy to impede this cellular signaling system, causing the harmful bacteria to pass blindly through the digestive tract," said Dr. Vanessa Sperandio, lead author of the study.

"You're not really attacking the bacteria per se," said Dr. Sperandio, assistant professor of microbiology at UT Southwestern. "You are just rendering it blind. The bacteria won't activate the virulent genes unless it knows where it is. If it can't activate the things it needs to bind to the intestine, it will be washed away."

In the past, beta blockers have been used to treat migraines, high blood pressure, glaucoma and tremors but not to impede infection. Developing new therapies for infection with this strain of *E. coli* — known as enterohemorrhagic *Escherichia coli*, or EHEC — is important because treatment with conventional antibiotics can cause the release of more toxins and may worsen the disease outcome.

Dr. Sperandio found that when a person ingests EHEC, the bacteria travel blindly through the digestive tract until reaching the intestine, where friendly bacterial flora in the intestine and the human hormone epinephrine, or adrenaline, send cellular signals alerting the bacteria to its location.

This cellular cross talk leads to a cascade of genetic activations in which the EHEC colonizes the intestine and translocates toxins into human cells, altering the makeup of the cells and robbing the body of nutrients. "The bacteria gets what it wants — nourishment — and the person ends up getting diarrhea," Dr. Sperandio said.

EHEC is responsible for outbreaks throughout the world of bloody diarrhea and hemolytic uremic syndrome — a condition that can lead to renal failure and death. Severe symptoms are most common in children, the elderly and immune-suppressed people.

EHEC is commonly transmitted through contaminated food or water. Foods known to have caused human infections include raw meat and unwashed vegetables.

The Centers for Disease Control and Prevention report 73,000 cases of EHEC infection annually in the United States, resulting in 61 deaths. Bloody diarrhea typically lasts about a week after infection with *E. coli*.

One week after the condition resolves, some patients may develop hemolytic uremic syndrome, which is characterized by gastrointestinal bleeding, reduced urine production and anemia.

"Treating EHEC infection with conventional antibiotics has shown to increase the chances that a patient will develop hemolytic uremic syndrome," Dr. Sperandio said. In 2000, an EHEC outbreak in Scotland affected thousands of people. Half of those infected received antibiotics, and half received no therapy. Of those treated with antibiotics, 18 percent developed the syndrome; of those receiving no treatment, only 5 percent developed the syndrome.

USDA Announces Initiatives to Improve Food Safety

Dr. Elsa Murano has released a food safety vision document that will guide continuing efforts to improve the safety of US meat, poultry and egg products and protect public health. Titled, "Enhancing Public Health: Strategies for the Future," the document outlines accomplishments to date as well as challenges that must be overcome in order to further reduce the incidence of foodborne illness.

"Americans enjoy one of the safest food supplies in the world

and it is getting safer," Murano said. "However, in spite of recent positive trends in reductions in foodborne illness, we also recognize the need to intensify our efforts to reduce illnesses even further. This document will help guide us as we focus on risks and science-based solutions to meet future challenges."

In March 2003, Agriculture Secretary Ann M. Veneman called for creative and effective ways to modernize the Food Safety and Inspection Service's ability to continue to improve the safety of US meat, poultry and egg products to better protect public health. The document identifies goals and strategies to be pursued by FSIS.

The document identifies many key steps taken in the past year to further protect public health. Most recently, FSIS announced a new rule requiring plants that produce ready-to-eat products to have effective programs in place to better control *Listeria monocytogenes*. In addition to testing, plants are required to share data and other relevant information with FSIS.

For a complete document "Enchancing Public Health: Strategies for the Future," visit http://www.fsis.usda.gov/oa/programs/vision071003.htm.

Food Safety: A Right for All People, Top UN Official Tells Meeting on Food Standards

Food safety is not a luxury of the rich, but a right of all people, a top UN official told representatives from 169 countries gathered in Rome, Italy, to consider the adoption of new standards to safeguard the health of consumers worldwide, while improving global agricultural trade opportunities.

UN Food and Agriculture Organization (FAO) director-General Jacques Diouf, in remarks delivered by his deputy, David Harcharik, at the opening of the 26th session of the Codex Alimentarius Commission, said the increase in volume and variety of foods inevitably creates a demand for standards that ensure fair trade practices across all countries and regions of the world.

"Increased foreign investment in food manufacturing industries and food distribution and retail industries also creates situations where harmonized food standards are desired among the regions in the world," General Jacques Diouf added.

FAO and the UN World Health Organization (WHO) established the Commission in 1962 to set safety standards and ensure fair practices in food trade.

"We have to recognize that food can never be defined as completely safe," WHO director-general Gro Brundtland said in video-taped remarks to the meeting. "The risks can be reduced through routine food safety work that must be carried out every day. This means countless men and women working diligently to protect human health throughout the food chain."

During the session – running until July 7 – the Commission is expected to adopt standards for levels of radiation that may be used in food irradiation, guidelines for assessing the food safety risks associated with foods derived from biotechnology among other things. In addition to food safety issues, Codex will consider the adoption of new standards that will clearly define many food items.

NFPA Applauds Announcement That FDA Has Received $5 Million for Food Security Research

Responding to an announcement made by Secretary of Health and Human Services Tommy Thompson and Food and Drug Administration Commissioner Dr. Mark McClellan that FDA has received $5 million for research on food security, John R. Cady, president and CEO of the National Food Processors Association (NFPA), made the following comments: "NFPA applauds the announcement that the Bush Administration has provided FDA with an additional $5 million in supplemental funding for food security research. NFPA strongly supports funding and targeted resources to help ensure the continued security of the food supply."

Both Secretary Thompson and FDA Commissioner McClellan emphasized that the focus of this new food security research will be on ways to prevent the intentional contamination of food. Research targeting risk management and prevention is highly appropriate, and our industry looks forward to working closely with FDA, as the nation's leading agency on food security, on this important new research.

The US has a long history of dealing with threats to food safety, from foodborne disease outbreaks and inadvertent contaminations to isolated incidents of product tampering. The research FDA will undertake should assess ways to build on the solid record of success

we have in this country on food security, and to make food security programs even more effective. Secretary Thompson and FDA Commissioner McClellan also noted that food import inspections have increased five-fold in the past two years. Ensuring the security of food imports through targeted, risk-based inspection activities is an important function of FDA, and helps to enhance our nation's food security.

NFPA strongly supports a rigorous US food security system, and we supported the Bioterrorism Act signed into law last year. Today, Secretary Thompson and FDA Commissioner McClellan also addressed new regulations that FDA has proposed to implement the Bioterrorism Act. NFPA has provided extensive comments to FDA on these proposed regulations. We believe that such regulations must be both effective and efficient, and should not impose unreasonable requirements on the food industry.

As proposed, FDA's regulations go well beyond Congressional intent. NFPA will continue to work with FDA to see that the final regulations are truly effective in enhancing food security. We were pleased that both Secretary Thompson and FDA Commissioner McClellan noted that FDA is continuing to consider comments from the food industry and other stakeholders on these proposed regulations, and that they expect that further changes will be made to the proposals.

Irradiation Food Safety Consumers Foodborne Illness Ground Beef

Sound studies conducted by experts in the field support the use of irradiation as a safe and effective method to reduce contamination in ground beef without risk to consumer health or satisfaction, contrary to unsubstantiated claims by groups critical of its use.

Exhaustive, sound studies conducted and reviewed by experts in the field of food science support the use of irradiation as a safe and effective method to reduce pathogen contamination in ground beef without risk to consumer health or satisfaction, contrary to unsubstantiated claims by groups critical of its use. Scientists who are expert in the field are opposed to efforts intent on spreading misinformation about the processing technique.

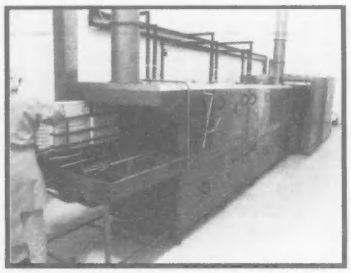
A recent review of irradiation published by Consumers' Union is an example of misleading information, say irradiation advocates. "Trying to manipulate opinion against an effective and safe method to kill bacteria that lead to foodborne illness is no benefit to consumers or to their health and safety," says Mark McLellan, an expert on irradiation as director of the Institute of Food Science and Engineering at Texas A&M University and president of the scientific society Institute of Food Technologists which is holding its annual meeting and food exposition in Chicago. "Fueling consumer uncertainty with baseless accusations contrary to scientific fact is irresponsible."

"Pasteurization of milk and seat belts for automobiles were controversial for a time, but we know conclusively they both save lives," said irradiation expert Christine Bruhn, who studies irradiation and consumer perspectives as director of the Center for Consumer Research at University of California at Davis. "The same will be true of irradiation, and those of us familiar with the technology have an obligation to share the safety benefits of irradiated foods with the public."

The Food and Agriculture Organization of the United Nations, International Atomic Energy Agency, the World Health Organization and IFT have concluded on the basis of knowledge derived from over 50 years of research that irradiated foods are safe and wholesome.

A summary of the exhaustive scientific studies examining public health benefits of irradiation is accessible at IFT's Web site, www.ift.org. The wealth of evidence clearly shows that the vitamin and mineral content of irradiated meats are not significantly affected by this process, nor is taste. Likewise, irradiation and food safety experts alike promote the use of irradiation as a helpful component to comprehensive food safety procedures that include cleanliness during the processing and handling of foods, and thorough cooking.

INDUSTRY PRODUCTS



WRH Industries, Ltd.

WRH Industries' Tunnel Washers Feature Jam-Proof Construction

A full line of modular tunnel washers for trays, tote boxes, pallets, and pallet containers that can be designed to meet 3-A Sanitary Standards is being introduced by WRH Industries, Ltd.

WRH/Mafo Tunnel Washers feature a proprietary polymer guidance system with a heavy-duty dual chain drive mechanism to assure proper alignment of the items being washed and prevent jamming. Designed for efficient and economical cleaning, they operate based upon a large volume of water contacting the product rather than high water pressure, and have an air knife system which can achieve 95% dryness without heat, depending upon part geometry.

Available in a wide range of in-line and stand-alone configurations to match specific customer requirements, WRH/Mafo Tunnel Washers incorporate high-efficiency motors, clog-proof nozzles, and all 304 stainless steel tunnels. Options include automatic stackers, self-cleaning rotating drum filters, vapor extraction and recovery systems, and variable speed motors. Applications include food, seafood, pharmaceutical, and similar processing.

WRH Industries, Ltd., Fall River, MA

READER SERVICE NO. 292

GFTC's Patent Approved for Innovative Package Testing Technology

The Guelph Food Technology Centre (GFTC) is pleased to announce a patent has now been approved around GFTC's innovative proprietary Oxygen Sensitive Indicator (OSI) technology. OSI was developed by Dr. Lindsay Mulholland and his team at GFTC.

"This is a great day for GFTC," said Terry Maurice, GFTC's president and CEO. "We are proud to be able to offer this technology to help the food industry and related sector in evaluating the various packaging options available to them, to extend their products' shelf life by choosing the best barriers for their needs."

The most important job a food package performs is that of protecting the food it contains from oxygen. The more oxygen reaching the food, the faster the food will spoil, the shorter its shelf life, and the smaller the number of potential consumers the food product can reach. This makes the selection of the right packaging vital to the success of a food product. GFTC's OSI system provides color change to indicate how much oxygen is getting in, and where. The GFTC's OSI technology is colorless to begin with, but as more oxygen enters the package, the indicator turns blue, first pale and then darker, and the faster the blue develops, the weaker the barrier is to oxygen. The OSI liquid system shows how much oxygen is getting into the whole package, and the OSI gelled system shows where the weaknesses are in the package by turning blue first in those locations.

"This is a very exciting technology because it accurately indicates how oxygen sensitive food will react in the package. Advantages over other existing methods of measuring oxygen ingression include non-destructive testing of multiple samples under various environmental conditions," explains Carol Zweep, GFTC's senior research scientist. "Optimizing packaging requirements to suit unique needs translates to savings for our clients."

Guelph Food Technology Centre, Guelph, Ontario, Canada

READER SERVICE NO. 293

Protect Your Brand with EcoShield™ from Ecolab

Ecolab Inc., a provider of critical environment sanitation products and systems, announces the introduction of a new integrated systems and operational productivity program called EcoShield. EcoShield is the only comprehensive food protection program that combines integrated intervention systems with complete operational productivity services for meat, food, poultry, dairy and beverage processors.

"We consistently strive to provide our customers with superior systems and products, and the creation of the EcoShield program showcases this commitment to our customers," said Tom Arata, vice president of

marketing, Ecolab Food & Beverage Division. "EcoShield is a program that is tailored to the unique needs of each of the customer segments we serve, combining all of the tools Ecolab has to offer, to help improve product quality and operating efficiency."

The pairing of integrated intervention systems and operational productivity services helps assure optimum product quality, shelf life and safety, improved efficiencies in plant operations.

EcoShield helps reduce the risk of contamination by providing a system that covers every critical point in the operation — from the moment raw materials enter the facility to the time the product is shipped to its final destination.

EcoShield provides complete diagnostics of customers' sanitation programs conducted by Ecolab specialists. The comprehensive evaluation includes detailed analysis of labor, water, energy and other key utilizations as well as on-site audits designed to pinpoint critical areas where processing efficiencies can be improved.

Ecolab Inc., St. Paul, MN

READER SERVICE NO. 294

Matrix MicroScience Has Launched the Fastest Commercially Available Method for the Detection of *E. coli* O157 in Food Samples

For a composite 375 g sample, the test can be completed in 6 3/4 hours from start to finish. Another version, which tests a 25 g sample, can be completed in just 5 1/4 hours.

The new test combines two of Matrix's proprietary technologies, Pathatrix and Colortrix. The Pathatrix system is designed for the rapid capture and concentration of pathogens, while Colortrix is a colorimetric detection method which provides presence/absence results within 15 minutes.

"The Pathatrix/Colortrix method, which is capable of detecting a single CFU in a 25 g or a 375 g sample, is proving particularly popular with the beef market, where accurate, rapid testing can significantly enhance productivity and is critical for QA," said Dr. Adrian Patron, managing director of Matrix MicroScience.

To undertake the test, a 375 g food sample is homogenized with 1 liter of growth media in a stomacher and incubated for 5 1/4 hours. Pathatrix capture reagent, which consists of *E. coli* specific, antibody coated magnetic beads, is then added directly to the sample. The sample is loaded onto the Pathatrix workstation, where it is circulated many times over the capture beads.

Once loaded, Pathatrix is programmed to run for 1 hour and on completion, the *E. coli* (if present) are bound onto the beads by the antibody. Residual debris and non-specific binding are removed during a single wash step.

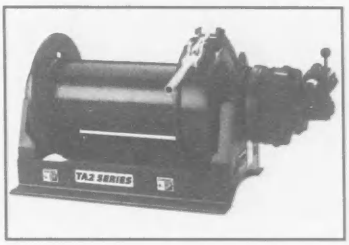
The captured pathogen/bead complex is then concentrated into a small volume, i.e., 200 µL using a magnetic rack.

To perform the detection step, Colortrix antibody/enzyme is then added to the concentrate for 5 minutes before being diluted with 5 ml of wash buffer. After a further two washes, half the concentrate is removed and added to a second reagent. The sample is then left for 5 minutes to develop color.

A blue color indicates a "presumptive positive," while a clear sample is recorded as a "presumptive negative." Should a positive result be recorded, the sample remaining in the wash vessel is plated on the appropriate agar media, while a negative indicates that no further action is required. Additionally, presumptive positives can be confirmed a rapid molecular method, e.g. PCR.

Matrix MicroScience Inc., Golden, CO

READER SERVICE NO. 295



Thern, Inc.

Thern, Inc. Announces New TA2 Air Winches

Thern's new TA2 air winches have been developed in response to marketplace demand for rapid delivery of rugged, reliable air winches backed by a responsive customer service program. Designed with extensive customer input and testing, these winches feature reliable radial piston air motors and heavy-duty construction for long service life. The compact design with planetary reducer inside of the drum allows the TA2 winches to be used in tight locations.

Other standard features on the TA2 winches include welded steel frame and drum, minimum D:d ratio of 18:1, motor-mounted control valve and manual band brake rated at 150% of winch capacity. The TA2 winches are available with either a 16-inch or 24-inch wide drum with 1/2 inch wire rope capacity up to 990 or 1,490 feet.

Options include special drum diameters and lengths, grooved drums, speed changes and special finishes. Line pull for TA2 winches ranges from 4,400 lbs to 7,200 lbs.

Thern, Inc., Winona, MN

READER SERVICE NO. 296

3M Introduces Homogenizer Bags

3M™ Homogenizer Bags, the latest additions to the 3M Microbiology line of products, are designed with the quality and reliability that laboratory technicians expect.

The Homogenizer Bag is an essential product in most food microbiology laboratories. Although it is a simple item, using a poor quality bag in your homogenizing machine can not only cause a cleaning nightmare if it breaks, but the integrity of the test you are running could be compromised if you are using bags that are not properly treated to prevent outside contamination.

3M Homogenizer Bags are manufactured with proven experience and uncompromising quality, and are designed to meet stringent laboratory testing needs. They are made of high quality 3 mil polyethylene for toughness and contain an additional additive for increased elasticity. These two features combined give them the strength needed to endure the sample preparation process. They provide high-impact strength even at low temperatures. The extra-wide 4 mm heat seal is designed to prevent leaking.

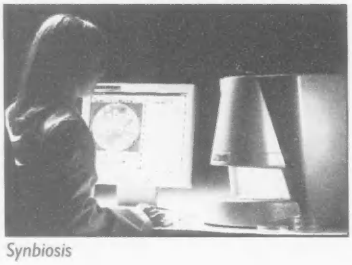
3M Homogenizer Bags are available in both standard and filtered styles and are sized to fit any 400 mL machine. Both styles are easy to open, and feature a write-on panel for labeling samples. You can simply write on or bar code the bag for test identification.

The filtered-style homogenizer bag allows for the separation of the liquid extract from sample solids, thereby preventing pipettor blockage. The filter section of this bag is made of durable, perforated polyethelene film. It is designed with strength in mind; the longer filter length gives extra reinforcement and support during the blending process. The filter and its solid contents can be easily removed if desired.

Both the standard and filtered 3M Homogenizer Bags come in slide trays for easy access, are gamma irradiated, and are backed by 3M's quality reputation.

3M Microbiology, St. Paul, MN

READER SERVICE NO. 297



Synbiosis

Synbiosis New Automated ProtoCOL Systems Guarantee Highly Accurate Colony Counting

Synbiosis, a manufacturer of automated microbiological systems announces the introduction of two new ProtoCOL automated colony counters, ProtoCOL SR and ProtoCOL HR. The systems are ideal for microbiologists requiring high performance automated counts of a wide range of colony types.

Both systems come with powerful new software for colony counting, inhibition zone sizing and antibacterial susceptibility zone sizing as standard. The latest firewire technology employed allows scientists to capture live high-resolution sample images in full color. To simultaneously analyze different colored colonies on chromogenic media, the systems can be upgraded with an optional software module.

The new ProtoCOL software, built on a state-of-the-art Windows XP platform, has a number of valuable time-saving features. These include displaying all useful parameters on one screen to simplify the operation. The measurement settings applied are automatically recorded for future use and size and shape discrimination facilities can be used to exclude unwanted artifacts from counts. The software's data-handling capabilities provide safe storage of results with changes to data automatically logged, while maintaining a copy of the original information. The final results can be instantly transferred to the preloaded Excel and sorted across projects too, if required.

The sensitivity of both ProtoCOL systems can be optimized to ensure accurate separation of touching colonies through the use of a powerful new size sensitivity feature. In terms of applications, a ProtoCOL HR is the best counter for measuring small colonies (down to 0.1 mm diameter) or zones, and for larger colony sizes (0.2 mm and above) the ProtoCOL SR is expected to be the system of choice.

Synbiosis, Frederick, MD

READER SERVICE NO. 298

Spectronics Corp. Ultraviolet Light Detects Aflatoxin Contamination in Stored Agricultural Commodities

Every year, aflatoxin — a carcinogenic mold — contaminates huge amounts of agricultural commodities, including corn, peanuts, sorghum, copra, and cottonseed. Early detection

of infected crops at storage facilities allows the aflatoxin to be isolated and helps prevent its spread.

A simple method to detect aflatoxin in farm products is to inspect them with a long wave UV lamp. The Spectroline® BIB-150P lamp is ideal for screening large quantities of food material quickly and with high sensitivity. The mold glows with a bright greenish-gold fluorescence when exposed to the UV light.

The BIB-150P delivers super-high UV intensity at an affordable price. Its 150-watt Built-in-Ballast™ bulb eliminates the need for a bulky external transformer. The lamp weighs only 3 1/4 pounds (1.5 kg) and is ergonomically designed with a contoured handle for comfortable use over long periods.

Spectronics Corporation, Westbury, NY

READER SERVICE NO. 299

NSW Scrubbing Wipes are Ready for Front Line Food Service

NSW, LLC has introduced a new line of advanced scrubbing wipes with many significant benefits for the food industry. The patented, NSW Scrubbing Wipes' design features a durable polyethylene mesh net, laminated to an absorbent nonwoven fabric.

Soft and strong, the non-allergenic NSW wipes have the wet strength to stand up to the toughest cleaning jobs. The NSW Scrubbing Wipes' highly absorbent nonwoven fabric will soak up excess juices, grease and oils. The NSW Wipes' non-marking polyethylene net laminate can scrub nearly any surface without scratching, including polished stainless, painted and plated surfaces, glass and other sensitive surfaces.

NSW Scrubbing Wipes are solvent resistant and can be used with water and commercial cleansers. The NSW Wipes are a more durable and effective cleaning material than paper or cloth towels. NSW Scrubbing Wipes won't shed lint or other debris that could clog drains and processing equipment, or compromise sanitation.

Highly durable and offered at value pricing, the NSW Scrubbing Wipes are also a cost-effective cleaning material alternative. The NSW Wipes will hold up longer in use and they can be washed and reused time and again.

NSW, LLC, Roanoke, VA

READER SERVICE NO. 300

SKF Introduces New Performance Class of Bearings for Pump Applications

A new performance class of bearings that enables pump designers and manufacturers to add value to their products by way of increased service life and reduced warranty claims is now available from SKF®. The new bearings, called SKF Explorer Angular Contact Ball Bearings (ACBB), are specifically designed to withstand the toughest pump-operating conditions. Under extensive laboratory testing, the bearings exhibited up to three times longer service life than conventional angular contact bearings. The increase in bearing performance offers pump designers and manufacturers vital new design options, including those for downsizing or extending mean time between failure (MTBF). Pump users can expect greater reliability and smoother operation of the pump system.

Drawing upon the latest advances in materials research and manufacturing precision, engineers developed SKF Explorer ACBB bearings to maximize the effects of lubrication while minimizing the effects of friction, wear and contamination on bearing and pump service life. Their unmatched level of performance increases the options open to pump designers and manufacturers. For example, using SKF Explorer ACBB bearings in place of conventional bearings in existing designs can increase a designer's options for using different impellers within the same basic pump size and also provide increased ability to handle cavitation. If there is no need for increasing output, speed or load, using SKF Explorer bearings of equal size in existing designs can extend a pump's MTBF through prolonged seal life, reduced operating temperatures and lower vibration levels.

By specifying SKF Explorer bearings in new designs, pump designers can use physically smaller bearings in smaller pumps to achieve the same output as a larger pump using conventional bearings. Such a reduction in overall dimensions translates into lighter, more energy efficient designs, providing for lower operating temperatures and increased speeds. Then, too, designers can use lower profile SKF Explorer bearings with the same outside diameter as conventional bearings to develop "stiffer" new designs with larger shafts but capable of operating at the same or higher speeds.

SKF Explorer ACBBs are available in single or double row configurations. Single-row SKF Explorer ACBB are typically used in pumps designed for operational reliability in applications requiring moderate to high speeds and heavy axial and radial loads. Double-row SKF Explorer ACBB, due to their excellent load and speed capabilities and their ease of mounting, are used extensively in ANSI and other medium-duty pumps. The double-row models have a 30-degree contact angle

to accommodate heavy thrust loads and shock loads caused by cavitation. Both single and double-rows come with ABMA ABEC3 precision levels as standard.

SKF Explorer ACBB adds value to pump users as well by providing more consistent, reliable operation. Because of the design and manufacturing improvements, these pump bearings will be less sensitive to overloads, poor operating conditions, and based on testing will run cooler and quieter. A modified, more robust retainer or cage in double-row bearings is especially suited for use in ANSI style pumps.

SKF Service Division, Kulpsville, PA

READER SERVICE NO. 301

Easy-to-Use TempLine™ Cable Reduces Cost Associated with Multiple Point Temperature Monitoring from Apprise Technologies

Apprise Technologies, Inc. announces TempLine, a single cable temperature measurement array for deployment in a wide range of in-situ and process control applications.

The affordable and easy-to-deploy and use TempLine product is manufactured to the customer's specifications. The customer can determine the cable length, number of sensors and sensor spacing. Data is transferred via RS-232 or SDI-12 allowing for plug-and-play data transfer to numerous third party data acquisition and control systems like SCADA and PLCs as well as telemetry systems. TempLine's lightweight and compact design reduces time and labor costs associated with multiple point temperature data collection by allowing one person to easily deploy and operate the device. In many applications, a substantial amount of manpower has been needed to acquire the same amount of data available by using TempLine.

"Having a product which can be manufactured to meet the specifications of the customer application at an affordable price is generating a lot of attention," said Cindy Martins, Apprise marketing director. "We are selling the TempLine to a broad base of customers, from power generators monitoring discharge temperature, to oceanographic research labs with limited manpower, to the US Army of Engineers for continuous monitoring of thermo discharge in dam management. The common denominator between TempLine customers is the desire to reduce the cost of multiple point temperature monitoring while maintaining high quality, reliable data," adds Martins.

TempLine has a broad temperature range from -18 to 85°C (-1 to 185°F) with a swift response time. TempLine's semiconductor temperature technology is easy to calibrate to an accuracy of ± 0.1°C (± 0.2°F), with the calibration coefficients residing in flash memory on the controller. The output signal from the TempLine cable is processed using an embedded micro controller and is transferred via RS-232 or SDI-12 communication protocol.

TempLine has a maximum cable length of 600 meters with up to 300 sensors. Internal data logger memory of 2MB holds up to 3400 time-stamped readings of 300 sensors. TempLine calibration is NIST traceable. Standard AA batteries power the system. Optional long-term (up to 12-month deployment) battery packs are also available.

Apprise Technologies, Inc., Duluth, MN

READER SERVICE NO. 302

COMING EVENTS

SEPTEMBER

- **30-Oct. 2, Washington Association for Food Protection Annual Meeting,** Campbells Resort, Chelan, WY. For more information, contact Bill Brewer at 206.363.5411.

OCTOBER

- **1-4, The 5th International Symposium on the Epidemiology and Control of Foodborne Pathogens in Pork,** Creta Maris Hotel, Hersonissos, Heraklion, Crete, Greece. For more information, call 30.210.749.93.00; E-mail: congress@triaenatours.gr.
- **2, American Association of Cereal Chemists 88th Annual Meeting,** Portland, OR. For more information, contact Kathryn Aro at 651. 454.7250; E-mail: karo@scisoc.org.
- **2-3, FSIS Verification of HACCP Plans–A Meat and Poultry Industry Workshop,** Omaha, NE. For more information, call 202.393.0890; E-mail: fpi@nfpa-food.org.
- **2-3, IDV and CSO for Meat and Poultry Industry,** Omaha, NE. For more information, call Food Processors Institute at 202.393.0890.
- **6-10, Dairy Technology Workshop** Randolph Associates, Inc., Nashville, TN. For more information, call 205.595.6455; E-mail: us@randolphconsulting.com.
- **7-8, Associated Illinois Milk, Food and Environmental Sanitarians Annual Fall Meeting,** Stoney Creek Hotel, Peoria, IL. For more information, contact John Ellingson at 815.490.5523.
- **8-11, Second International Symposium on Sourdough,** Brussels, Belgium. For more information, call 32.16.204035; E-mail: aacc@scisoc-europe.org.
- **9, Rapid Microbial Methods,** Guelph, Ontario, Canada. For more information, contact Marlene Inglis at 519.821.1246; E-mail: minglis@gftc.ca.
- **14, SQF Systems Awareness Training,** GFTC, Guelph, Ontario, Canada. For more information, call 519.821.1246; E-mail: gftc@gftc.ca.
- **14-16, Food Security Coordinator Workshop,** Toronto, Canada. For more information, call AIB at 785.537.4750.
- **15-16, Food Allergens: Issues and Solutions for the Food Product Manufacturer,** Hotel Sofitel, O'Hare, Chicago, IL. For more information, contact Pauline Galloway at 402. 472.9751; E-mail: pgalloway2@unl.edu.
- **19-22, University of Wisconsin-River Falls 23rd Annual Food Microbiology Symposium,** (Current Concepts in Foodborne Pathogens and Rapid and Automated Methods in Food Microbology), University of Wisconsin-River Falls. For more information, contact the University of Wisconsin-River Falls Animal and Food Science Dept. at 715.425.3704; E-mail: foodmicro@uwrf. edu.
- **20-22, Thermal Process Development,** Dublin, CA. For more information, call Food Processors Institute at 202.393.0890.
- **21-22, Cal Poly Dairy Cleaning and Sanitation Short Course,** Davis, CA. For more information, contact Laurie Jacobson at 805.756. 6097; E-mail: ljacobso@calpoly.edu.
- **22, Metropolitan Association for Food Protection Annual Spring Meeting,** Rutgers, Cook College, New Brunswick, NJ. For more information, contact Carol Schwar at 908.689.6693.
- **23-24, Thermal Process Development,** Dublin, CA. For more information, call Food Processors Institute at 800.355.0983.
- **27-28, HACCP IV: Validation and Verification of Your HACCP Plan,** GFTC, Guelph, Ontario, Canada. For more information, call 519.821.1246; E-mail: gftc@gftc.ca.
- **28-30, Applied Extrusion,** University of Nebraska Food Processing Center, Lincoln, NE. For more information, contact Pauline Galloway at 402. 472.9751; E-mail: pgalloway2@unl.edu.
- **28-30, North Dakota Environmental Health Association Annual Fall Meeting,** Spirit Lake Resort, Devil's Lake, ND. For more information, contact Debra Larson at 701.328.6150.
- **29-30, HACCP V: Effective Auditing of Your HACCP Plan,** GFTC, Guelph, Ontario, Canada. For more information, call 519.821.1246; E-mail: gftc@gftc.ca.
- **29-30, Iowa Association for Food Protection Annual Fall Meeting,** Ames, IA. For more information, contact Phyllis Borer at 712.754.2511, ext. 33.
- **29-31, HACCP for Juice Processors,** Miami, FL. For more information, call Food Processors Institute at 202.393.0890.
- **29-Nov. 1, Worldwide Food Expo,** McCormick Place, Chicago, IL. For general information, contact Pamela Morrison at 202.220.3532 or go to www. wwfe@idfa.org.

NOVEMBER

- **4-6, Food Security Coordinator Workshop,** Sacramento, CA. For more information, call AIB at 785. 537.4750.
- **5, HACCP: A Management Summary,** Guelph, Ontario, Canada. For more information, call Guelph Food Technology Centre at 519.821.1246; E-mail: gftc@gftc.ca.
- **6-7, Advanced HACCP,** Davis, CA. For more information, call Food Processors Institute at 202.393.0890; E-mail: jepstein@nfpa-food.org.
- **8-9, Mexico Association for Food Protection Annual Fall Meeting,** Mission Carlton Hotel, Guadalajara, Jal., Mexico. For more information, contact Alex Castillo at 979.845.3565.

IAFP UPCOMING MEETINGS

AUGUST 8-11, 2004
Phoenix, Arizona

AUGUST 14-17, 2005
Baltimore, Maryland

AUGUST 13-16, 2006
Calgary, Alberta, Canada

COMING EVENTS

- **9-13, 6th OIE Seminar on Biotechnology and 11th International Symposium of the World Association of Veterinary Laboratory Diagnosticians,** Bangkok, Thailand. For more information, call OIE at 33.1.44.15.18.88.
- **10-11, American Dairy Product Institute Lactose Utilization Seminar,** in conjunction with Germany's Institute for Dairy Innovation and Marketing, Atlanta, GA. For more information, call 630.530.8700; E-mail: info@adpi.org.
- **11-12, Food Plant Sanitation,** Guelph, Ontario, Canada. For more information, call Guelph Food Technology Centre at 519.821.1246; E-mail: gftc@gftc.ca.
- **17-21, Brazil Association for Food Protection Annual Meeting,** Centro-Sul Convention Center, Florianopolis, Santa Catarina State, Brazil. For more information, contact Maria Teresa Destro at 55.11.3091.2199.
- **19, Alabama Association for Food Protection Annual Fall Meeting,** Holiday Inn, Homewood, AL. For more information, contact G. M. Gallaspy at 334.206.5375.
- **20, Ontario Food Protection Association Annual Fall Meeting,** Mississauga Convention Centre, Mississauga, Ontario, Canada. For more information, contact Glenna Haller at 519.823.8015.
- **27-28, SQF 1000/2000^{CM} Systems Training,** GFTC, Guelph, Ontario, Canada. For more information, call 519.821.1246; E-mail: gftc@gftc.ca.

DECEMBER

- **3-5, Basic HACCP,** Ithaca, NY. For more information, call Food Processors Institute at 202.393.0890; E-mail: jepstein@nfpa-food.org.
- **9-12, Refrigeration and Deep-Freeze,** Triumph Pavilion, Rosstroy Expo in Moscow. For more information, contact Ken Cardelle at 203.357.1400; E-mail: KCardelle@iegexpo.com.

IT'S A FACT

September is National Food Safety Month

ADVERTISING INDEX

Request for Preproposals for Research Support

ILSI

International Life Sciences INSTITUTE

The International Life Sciences Institute (ILSI) North America Technical Committee on Food Microbiology is accepting preproposals for financial support for research in these areas: 1) ecology of foodborne pathogens (resistance to traditional or novel processing and preservation methods, microbial survival and persistence in food and food environments, and characterization of survival and persistence of viral foodborne pathogens in foods and food processing environments); 2) sampling techniques and concentration; and 3) non-primate animal models to assess *E. sakazakii* virulence and pathogenicity. **The deadline for submission of preproposals is October 20, 2003**. Copies of the Request for Preproposals can be obtained from the ILSI office or electronically from the ILSI website (www.ilsi.org). FOR MORE INFORMATION, CONTACT: Catherine Nnoka, ILSI North America, One Thomas Circle, NW, Ninth floor, Washington, DC, 20005, USA, Tel: 202-659-0074, Fax: 202-659-3859, E-mail:cnnoka@ilsi.org.

Thanks for making IAFP 2003 a success!

International Association for Food Protection®

Abstract Supplement to the Journal of Food Protection IAFP 2003 Abstracts

Name _____

Job Title _____ Company Name _____

Address _____

City _____ State or Province _____

Country _____ Postal/Zip Code _____

Telephone # _____ E-mail _____

Quantity _____ @ $25.00 each
(includes shipping and handling)

Total Payment _____

US FUNDS on US BANK

METHOD OF PAYMENT

❑ CHECK OR MONEY ORDER ENCLOSED

❑ MASTERCARD ❑ VISA ❑ AMERICAN EXPRESS

EXP. DATE _____

SIGNATURE _____

Journal of Food Protection®

ISSN: 0362-028X
Official Publication

International Association for Food Protection

Reg. U.S. Pat. Off.

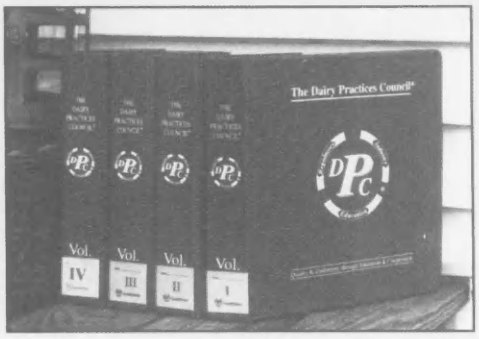
Vol. 66 **September 2003** **No. 9**

Letter to the Editor

Articles

* Asterisk indicates author for correspondence.

Research Notes



IAFP Offers "Guidelines for the Dairy Industry" from The Dairy Practices Council®

This newly expanded Four-volume set consists of 70 guidelines.

1 Planning Dairy Freestall Barns
2 Effective Installation, Cleaning, and Sanitizing of Milking Systems
3 Selected Personnel in Milk Sanitation
4 Installation, Cleaning, & Sanitizing of Large Parlor Milking Systems
5 Directory of Dairy Farm Building & Milking System Resource People
6 Natural Ventilation for Dairy Tie Stall Barns
7 Sampling Fluid Milk
8 Good Manufacturing Practices for Dairy Processing Plants
9 Fundamentals of Cleaning & Sanitizing Farm Milk Handling Equipment
10 Maintaining & Testing Fluid Milk Shelf-Life
11 Sediment Testing & Producing Clean Milk
12 Tunnel Ventilation for Dairy Tie Stall Barns
13 Environmental Air Control and Quality for Dairy Food Plants
14 Clean Room Technology
15 Milking Center Wastewater
16 Handling Dairy Products from Processing to Consumption
17 Prevention of & Testing for Added Water in Milk
18 Fieldperson's Guide to High Somatic Cell Counts
21 Raw Milk Quality Tests
22 Control of Antibacterial Drugs & Growth Inhibitors in Milk and Milk Products
23 Preventing Rancid Flavors in Milk
24 Troubleshooting High Bacteria Counts of Raw Milk
25 Cleaning & Sanitation Responsibilities for Bulk Pickup & Transport Tankers
27 Dairy Manure Management From Barn to Storage
28 Troubleshooting Residual Films on Dairy Farm Milk Handling Equipment
29 Cleaning & Sanitizing in Fluid Milk Processing Plants
30 Potable Water on Dairy Farms
31 Composition & Nutritive Value of Dairy Products
32 Fat Test Variations in Raw Milk
33 Brucellosis & Some Other Milkborne Diseases
34 Butterfat Determinations of Various Dairy Products
35 Dairy Plant Waste Management
36 Dairy Farm Inspection
37 Planning Dairy Stall Barns
38 Preventing Off-Flavors in Milk
39 Grade A Fluid Milk Plant Inspection
40 Controlling Fluid Milk Volume and Fat Losses
41 Milkrooms and Bulk Tank Installations
42 Stray Voltage on Dairy Farms
43 Farm Tank Calibrating and Checking
45 Gravity Flow Gutters for Manure Removal in Milking Barns
46 Dairy Odor Management
48 Cooling Milk on the Farm
49 Pre- & Postmilking Teat Disinfectants
50 Farm Bulk Milk Collection Procedures
51 Controlling the Accuracy of Electronic Testing Instruments for Milk Components
53 Vitamin Fortification of Fluid Milk Products
54 Selection of Elevated Milking Parlors
54S Construction Materials for Milking Parlors
56 Dairy Product Safety (Pathogenic Bacteria) for Fluid Milk and Frozen Dessert Plants
57 Dairy Plant Sanitation
58 Sizing Dairy Farm Water Heater Systems
59 Production and Regulation of Quality Dairy Goat Milk
60 Trouble Shooting Microbial Defects: Product Line Sampling & Hygiene Monitoring
61 Frozen Dessert Processing
62 Resources For Dairy Equipment Construction Evaluation
63 Controlling The Quality And Use Of Dairy Product Rework
64 Control Points for Good Management Practices on Dairy Farms
65 Installing & Operating Milk Precoolers Properly on Dairy Farms
66 Planning A Dairy Complex - "100+ Questions To Ask"
69 Abnormal Milk - Risk Reduction and HACCP
71 Farmers Guide To Somatic Cell Counts In Sheep
72 Farmers Guide To Somatic Cell Counts In Goats
73 Layout of Dairy Milk Houses for Small Ruminant Operations
78 Biosecurity for Sheep and Goat Dairies
80 Food Allergen Awareness In Dairy Plant Operations
83 Bottling Water in Fluid Milk Plants
100 Food Safety in Farmstead Cheesemaking
103 Approving Milk and Milk Product Plants for Extended Runs

IAFP has agreed with The Dairy Practices Council to distribute their guidelines. DPC is a non-profit organization of education, industry and regulatory personnel concerned with milk quality and sanitation throughout the United States. In addition, its membership roster lists individuals and organizations throughout the world.

For the past 34 years, DPC's primary mission has been the development and distribution of educational guidelines directed to proper and improved sanitation practices in the production, processing, and distribution of high quality milk and milk products.

The DPC Guidelines are written by professionals who comprise six permanent task forces. Prior to distribution, every guideline is submitted for approval to the state regulatory agencies in each member state. Should any official have an exception to a section of a proposed guideline, that exception is noted in the final document.

The guidelines are renown for their common sense and useful approach to proper and improved sanitation practices. We think they will be a valuable addition to your professional reference library.

If purchased individually, the entire set would cost $327. We are offering the set, packaged in four looseleaf binders for $245.00.

Information on how to receive new and updated guidelines will be included with your order.

To purchase this important source of information, complete the order form below and mail or fax (515-276-8655) to IAFP.

Please enclose $245 plus $17 shipping and handling for each set of guidelines within the U.S. Outside U.S., shipping will depend on existing rates. Payment in U.S. $ drawn on a U.S. bank or by credit card.

Name Phone No.

Company

Street Address

City, State/Province, Code

VISA/MC/AE No. Exp. Date

AUDIOVISUAL LIBRARY ORDER FORM

The use of the Audiovisual Library is a benefit for **Association Members only.** Limit your requests to five videos. Material from the Audiovisual Library can be checked out for 2 weeks only so that all Members can benefit from its use.

International Association for Food Protection®
6200 Aurora Avenue, Suite 200W
Des Moines, IA 50322-2864, USA
Phone: 800.369.6337; 515.276.3344;
Fax: 515.276.8655
E-Mail: info@foodprotection.org
Web Site: www.foodprotection.org

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 _____ Date Needed _____

PLEASE CHECK BOX NEXT TO YOUR VIDEO CHOICE

(Allow 4 weeks minimum from date of request.)

DAIRY

- ❒ D1180 10 Points to Dairy Quality
- ❒ D1010 The Bulk Milk Hauler: Protocol & Procedures
- ❒ D1030 Cold Hard Facts
- ❒ D1040 Ether Extraction Method for Determination of Raw Milk
- ❒ D1060 Frozen Dairy Products
- ❒ D1070 The Gerber Butterfat Test
- ❒ D1080 High-Temperature, Short-Time Pasteurizer
- ❒ D1090 Managing Milking Quality
- ❒ D1100 Mastitis Prevention and Control
- ❒ D1105 Milk Hauler Training
- ❒ D1110 Milk Plant Sanitation: Chemical Solution
- ❒ D1120 Milk Processing Plant Inspection Procedures
- ❒ D1125 Ohio Bulk Milk Hauling
- ❒ D1130 Pasteurizer – Design and Regulation
- ❒ D1140 Pasteurizer – Operation
- ❒ D1150 Processing Fluid Milk (slides)

ENVIRONMENTAL

- ❒ E3010 The ABCs of Clean – A Handwashing & Cleanliness Program for Early Childhood Programs
- ❒ E3020 Acceptable Risks?
- ❒ E3030 Air Pollution: Indoor
- ❒ E3031 Allergy Beware
- ❒ E3040 Asbestos Awareness
- ❒ E3055 Effective Handwashing–Preventing Cross-Contamination in the Food Service Industry
- ❒ E3060 EPA Test Methods for Freshwater Effluent Toxicity Tests (Using Ceriodaphnia)
- ❒ E3070 EPA Test Methods for Freshwater Effluent Toxicity Tests (Using Fathead Minnow Larva)
- ❒ E3075 EPA: This is Superfund
- ❒ E3080 Fit to Drink
- ❒ E3110 Garbage: The Movie
- ❒ E3120 Global Warming: Hot Times Ahead
- ❒ E3130 Kentucky Public Swimming Pool & Bathing Facilities
- ❒ E3135 Plastic Recycling Today: A Growing Resource
- ❒ E3140 Putting Aside Pesticides
- ❒ E3150 Radon
- ❒ E3160 RCRA – Hazardous Waste
- ❒ E3161 The Kitchen Uncovered Orkin Sanitized EMP
- ❒ E3170 The New Superfund: What It is & How It Works–(1) Changes in the Remedial Process: Clean-up Standards & State Involvement Requirements
- ❒ E3180 The New Superfund: What It is & How It Works–(2) Changes in the Removal Process: Removal & Additional Program Requirements
- ❒ E3190 The New Superfund: What It is & How It Works – (3) Enforcement and Federal Facilities
- ❒ E3210 The New Superfund: What It is & How It Works – (4) Emergency Preparedness & Community Right-to-Know
- ❒ E3220 The New Superfund: What It is & How It Works – (5) Underground Storage Tank Trust Fund & Response Program
- ❒ E3230 The New Superfund: What It is & How It Works – (6) Research & Development/Closing Remarks
- ❒ E3240 Sink a Germ
- ❒ E3245 Wash Your Hands
- ❒ E3250 Waste Not: Reducing Hazardous Waste

FOOD

- ❒ F2260 100 Degrees of Doom...The Time & Temperature Caper
- ❒ F2450 A Guide to Making Safe Smoked Fish
- ❒ F2005 A Lot on the Line
- ❒ F2007 The Amazing World of Microorganisms
- ❒ F2008 A Recipe for Food Safety Success
- ❒ F2009 Basic Personnel Practices
- ❒ F2440 Cleaning & Sanitizing in Vegetable Processing Plants: Do It Well, Do It Safely!
- ❒ F2010 Close Encounters of the Bird Kind
- ❒ F2015 Controlling *Listeria*: A Team Approach
- ❒ F2111 Controlling *Salmonella*: Strategies that Work
- ❒ F2037 Cooking and Cooling of Meat and Poultry Products (2 Videos)
- ❒ F2030 "Egg Games" Foodservice Egg Handling and Safety
- ❒ F2020 Egg Handling & Safety
- ❒ F2036 Emerging Pathogens and Grinding and Cooking Comminuted Beef (2 Videos)
- ❒ F2035 Fabrication and Curing of Meat and Poultry Products (2 Videos) *FastTrack Restaurant Video Kit*
- ❒ F2500 Tape 1–Food Safety Essentials
- ❒ F2501 Tape 2–Receiving and Storage
- ❒ F2502 Tape 3–Service
- ❒ F2503 Tape 4–Food Production
- ❒ F2504 Tape 5–Warewashing
- ❒ F2039 Food for Thought – The GMP Quiz Show
- ❒ F2040 Food Irradiation
- ❒ F2045 Food Microbiological Control (6 Videos)
- ❒ F2050 Food Safe – Food Smart – HACCP & Its Application to the Food Industry (Part 1&2)
- ❒ F2060 Food Safe – Series I (4 Videos)
- ❒ F2070 Food Safe – Series II (4 Videos)
- ❒ F2080 Food Safe – Series III (4 Videos)
- ❒ F2133 Food Safety First
- ❒ F2090 Food Safety: An Educational Video for Institutional Food-Service Workers *Food Safety for Food Service – Series I*
- ❒ F2100 Tape 1–Cross Contamination
- ❒ F2101 Tape 2– HACCP
- ❒ F2102 Tape 3–Personal Hygiene
- ❒ F2103 Tape 4–Time and Temperature Controls *Food Safety for Food Service – Series II*
- ❒ F2104 Tape 1–Basic Microbiology and Foodborne Illness
- ❒ F2105 Tape 2– Handling Knives, Cuts and Burns
- ❒ F2106 Tape 3–Working Safely to Prevent Injury
- ❒ F2107 Tape 4–Sanitation
- ❒ F2120 Food Safety: For Goodness Sake, Keep Food Safe
- ❒ F2110 Food Safety is No Mystery
- ❒ F2130 Food Safety: You Make the Difference
- ❒ F2125 Food Safety Zone: Basic Microbiology
- ❒ F2126 Food Safety Zone: Cross Contamination
- ❒ F2127 Food Safety Zone: Personal Hygiene
- ❒ F2128 Food Safety Zone: Sanitation
- ❒ F2129 Food Technology: Irradiation
- ❒ F2135 Get with a Safe Food Attitude
- ❒ F2136 GLP Basics: Safety in the Food Micro Lab
- ❒ F2137 GMP Basics: Avoiding Microbial Cross-Contamination
- ❒ F2140 GMP Basics: Employee Hygiene Practices
- ❒ F2143 GMP Basics: Guidelines for Maintenance Personnel
- ❒ F2148 GMP – GSP Employee
- ❒ F2150 GMP: Personal Hygiene and Practices in Food Manufacturing
- ❒ F2147 GMP Basics: Process Control Practices *GMP Food Safety Video Services*
- ❒ F2151 Tape 1: Definitions
- ❒ F2152 Tape 2: Personnel and Personnel Facilities
- ❒ F2153 Tape 3: Building and Facilities
- ❒ F2154 Tape 4: Equipment and Utensils
- ❒ F2155 Tape 5: Production and Process Controls
- ❒ F2160 GMP: Sources & Control of Contamination during Processing *GMPs for Food Plant Employees: 5 Volume Video Series Based on European Standards and Regulations*
- ❒ F2161 Tape 1: Definitions
- ❒ F2161 Tape 2: Personnel and Personnel Facilities
- ❒ F2163 Tape 3: Building and Facilities
- ❒ F2164 Tape 4: Equipment and Utensils
- ❒ F2165 Tape 5: Production/Process Controls
- ❒ F2180 HACCP: Safe Food Handling Techniques
- ❒ F2169 HACCP:Training for Employees–USDA Awareness
- ❒ F2172 HACCP:Training for Managers
- ❒ F2170 The Heart of HACCP
- ❒ F2171 HACCP: The Way to Food Safety
- ❒ F2173 Inside HACCP: Principles, Practices & Results
- ❒ F2175 Inspecting for Food Safety – Kentucky's Food Code
- ❒ F2190 Is What You Order What You Get? Seafood Integrity
- ❒ F2210 Northern Delight – From Canada to the World
- ❒ F2240 On the Front Line
- ❒ F2250 On the Line
- ❒ F2270 Pest Control in Seafood Processing Plants
- ❒ F2271 Preventing Foodborne Illness
- ❒ F2280 Principles of Warehouse Sanitation
- ❒ F2290 Product Safety & Shelf Life
- ❒ F2220 Proper Handling of Peracidic Acid
- ❒ F2230 Purely Coincidental
- ❒ F2310 Safe Food: You Can Make a Difference
- ❒ F2320 Safe Handwashing
- ❒ F2325 Safe Practices for Sausage Production
- ❒ F2460 Safer Processing of Sprouts
- ❒ F2330 Sanitation for Seafood Processing Personnel
- ❒ F2340 Sanitizing for Safety
- ❒ F2341 Science and Our Food Supply
- ❒ F2350 SERVSAFE® Steps to Food Safety (6 Videos)
- ❒ F2430 Smart Sanitation: Principles & Practices for Effectively Cleaning Your Food Plant
- ❒ F2370 Supermarket Sanitation Program – "Cleaning & Sanitizing"
- ❒ F2380 Supermarket Sanitation Program – "Food Safety"
- ❒ F2390 Take Aim at Sanitation
- ❒ F2410 Wide World of Food-Service Brushes
- ❒ F2420 Your Health in Our Hands – Our Health in Yours

OTHER

- ❒ M4010 Diet, Nutrition & Cancer
- ❒ M4020 Eating Defensively: Food Safety Advice for Persons with AIDS
- ❒ M4030 Ice: The Forgotten Food
- ❒ M4050 Personal Hygiene & Sanitation for Food Processing Employees
- ❒ M4060 Psychiatric Aspects of Product Tampering
- ❒ M4070 Tampering: The Issue Examined

Visit our Web site at www.foodprotection.org for detailed tape descriptions

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:

QUANTITY	DESCRIPTION	MEMBER OR GOV'T PRICE	NON-MEMBER PRICE	TOTAL
	Procedures to Investigate Waterborne Illness—2nd Edition	$10.00	$20.00	
	Procedures to Investigate Foodborne Illness—5th Edition	10.00	20.00	

SHIPPING AND HANDLING – $3.00 (US) $5.00 (Outside US) Each additional booklet $1.50 Shipping/Handling

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

OTHER PUBLICATIONS:

QUANTITY	DESCRIPTION	MEMBER OR GOV'T PRICE	NON-MEMBER PRICE	TOTAL
	*International Food Safety Icons CD	$ 25.00	$25.00	
	Pocket Guide to Dairy Sanitation (minimum order of 10)	$ .60	$1.20	
	Before Disaster Strikes…A Guide to Food Safety in the Home (minimum order of 10)	.60	1.20	
	Food Safety at Temporary Events (minimum order of 10)	.60	1.20	
	*Developing HACCP Plans–A Five-Part Series (as published in *DFES*)	15.00	15.00	
	*Surveillance of Foodborne Disease – A Four-Part Series (as published in *JFP*)	18.75	18.75	
	*Annual Meeting Abstract Book Supplement (year requested _____)	25.00	25.00	
	*IAFP History 1911-2000	25.00	25.00	

SHIPPING AND HANDLING – per 10 – $2.50 (US) $3.50 (Outside US) Shipping/Handling

*Includes shipping and handling Other Publications Total

TOTAL ORDER AMOUNT

Prices effective through August 31, 2004

PAYMENT:

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

❑ **Check or Money Order Enclosed** ❑ VISA ❑ MasterCard ❑

CREDIT CARD # _____

EXP. DATE _____

SIGNATURE _____

International Association for Food Protection®

4 EASY WAYS TO ORDER

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

MEMBERSHIP APPLICATION

MEMBERSHIP DATA:

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.

MEMBERSHIP CATEGORIES:

MEMBERSHIPS	US	Canada/Mexico	International
❑ **Membership with *JFP & FPT – BEST VALUE!***	$165.00	$200.00	$245.00
12 issues of the *Journal of Food Protection* and *Food Protection Trends* (formerly *DFES*)			
❑ add *JFP* Online	$36.00	$36.00	$36.00
❑ **Membership with *FPT***	$95.00	$110.00	$125.00
12 issues of *Food Protection Trends*			
❑ add *JFP* Online	$36.00	$36.00	$36.00
❑ ***Student Membership with *JFP & FPT***	$82.50	$117.50	$162.50
❑ ***Student Membership with *JFP***	$47.50	$67.50	$97.50
❑ ***Student Membership with *FPT***	$47.50	$62.50	$77.50
❑ add *JFP* Online	$36.00	$36.00	$36.00

*Student verification must accompany this form.

SUSTAINING MEMBERSHIPS

Recognition for your organization and many other benefits. *JFP* Online included.

❑ **GOLD**	$5,000.00
❑ **SILVER**	$2,500.00
❑ **SUSTAINING**	$750.00

PAYMENT:

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

❑ **Check Enclosed** ❑ VISA ❑ MasterCard ❑ Discover

TOTAL MEMBERSHIP PAYMENT $ _____

All prices include shipping and handling
Prices effective through August 31, 2004

CREDIT CARD # _____

EXP. DATE _____

SIGNATURE _____

International Association for Food Protection®

4 EASY WAYS TO JOIN

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

IAFP 2004

Phoenix, Arizona

August 8-11, 2004

Exposing the Enemy!

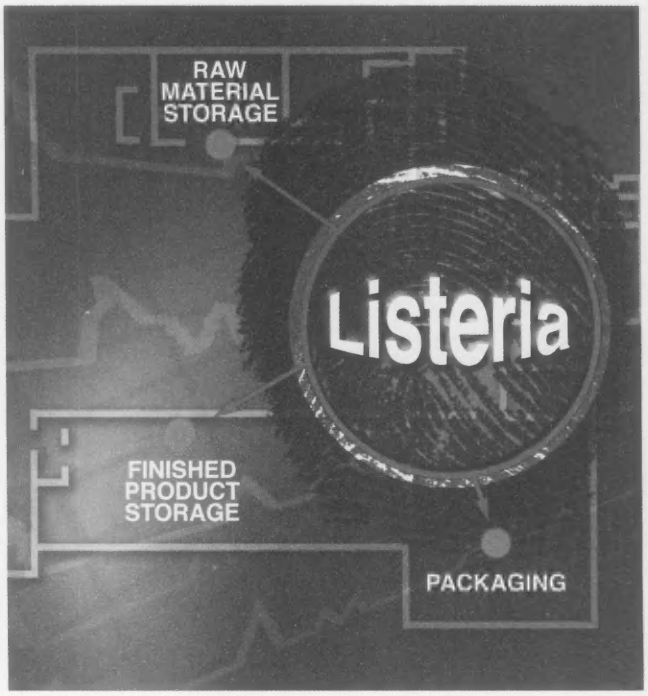
If there was an intruder in your plant putting the health of your business at risk, wouldn't you want its fingerprints?

Call DuPont™ Food Risk Assessment™ to the scene to investigate your facility for molecular intruders.

Our Microbial Mapping offering can help you expose pathogens or spoilage organisms that may be lurking in your plant, contaminating your products and compromising their integrity.

Our team of experts can capture the genetic fingerprints of the microbial intruders, revealing their identity and tracing their movement – helping you to eliminate them.

Knowledge is power... know your enemy. Protect your brand and your bottom line with **Microbial Mapping** from DuPont™ Food Risk Assessment™.



Protect your brand... get a molecular detective working for you.
DuPont™ Food Risk Assessment™
1-800-387-2122

DUPONT
The miracles of science™

Reader Service No. 178