FEBRUARY 2000•VOL. 20•NO. 2•PAGES 101-176

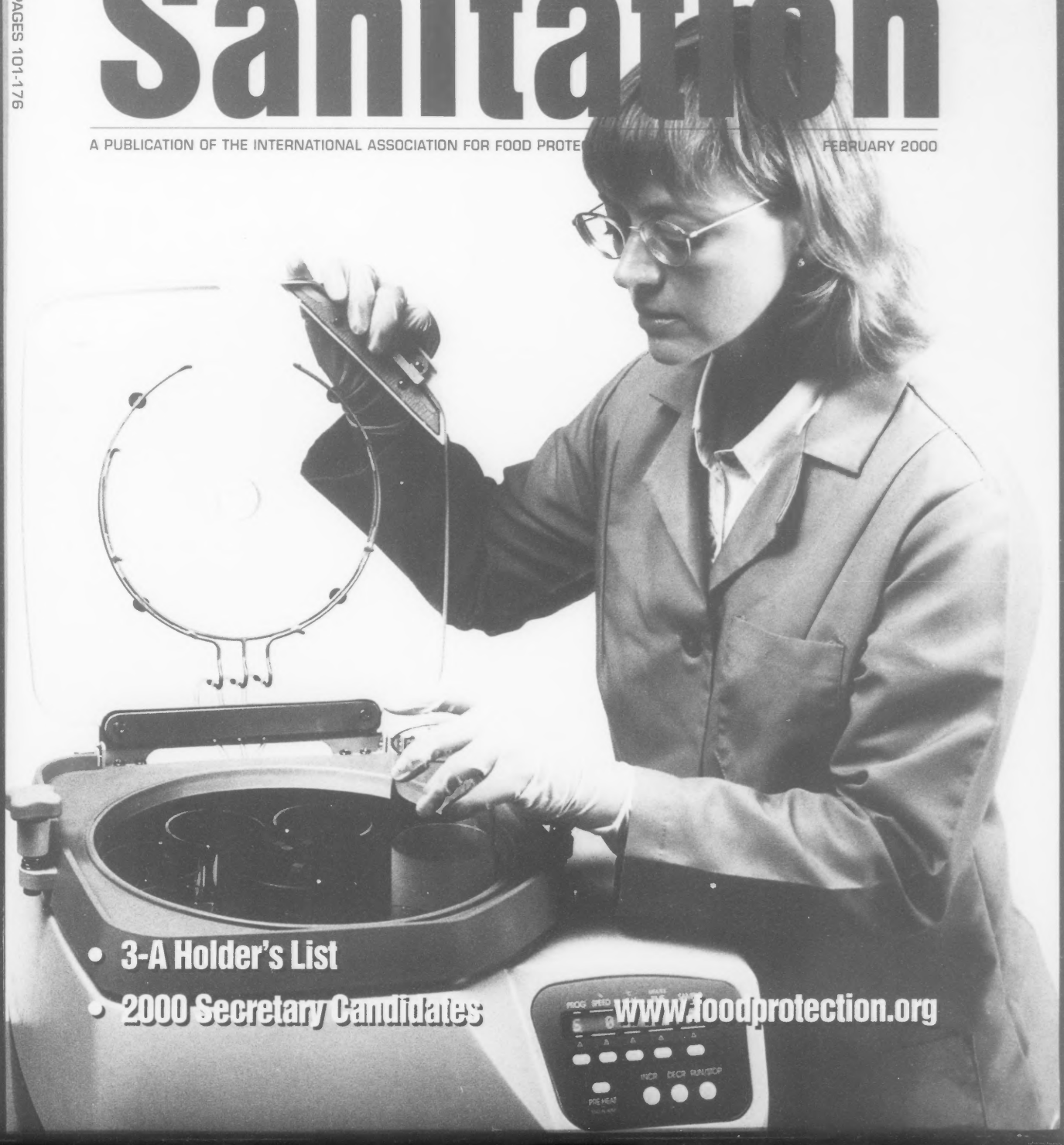
ISSN: 1043-3546
PERIODICALS
6200 Aurora Avenue•Suite 200W
Des Moines, Iowa•USA•50322

DAIRY, FOOD AND ENVIRONMENTAL

# Sanitation

A PUBLICATION OF THE INTERNATIONAL ASSOCIATION FOR FOOD PROTE

FEBRUARY 2000



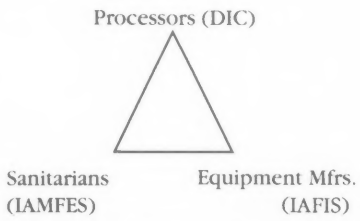
- 3-A Holder's List
- 2000 Secretary Candidates

www.foodprotection.org

# MARK OF COMPLIANCE

## The 3-A Symbol Story

The 3-A Sanitary Standards Symbol Administrative Council, known throughout the industry as the "**3-A Symbol Council**," was organized in 1956. Its purpose is to grant authorization to use the **3-A Symbol** on equipment that meets 3-A Sanitary Standards for design and fabrication.




## A Modern Concept

The modern concept of the 3-A program was established in 1944 when the Dairy Industry Committee (DIC) was formed. DIC is one of the three industry segments involved in the preparation of 3-A Sanitary Standards. These industry segments are:

- **Processors,** represented by DIC
- **Equipment Manufacturers**, represented by IAFIS
- **Sanitarians**, represented by IAMFES

## Use of the Symbol

Voluntary use of the **3-A Symbol** on dairy equipment:

- assures processors that equipment meets sanitary standards
- provides accepted criteria to equipment manufacturers for sanitary design & fabrication
- establishes guidelines for uniform evaluation and compliance by sanitarians.

**3-A Sanitary Standards Symbol Administrative Council**

**1500 Second Avenue S.E., Suite 209**

**Cedar Rapids, IA 52403**

**319-286-9221 phone** **319-286-9290 fax**

**ABOUT THE COVER...**

Phata courtesy af Labcanca Carparation. The RapidVap® N2 Evaporatian Systems combine nitragen blaw dawn with vartex motian and heat.

*Use af this phata does nat imply endarsement of any product by the Internatianal Associatian far Faad Pratection.*

DAIRY, FOOD AND ENVIRONMENTAL

# Sanitation

International Association for Food Protection

## Articles



## Association News



## Departments



## Extras

**ABOUT THE COVER...**

Photo courtesy of Labconco Corporation. The RapidVap® N2 Evaporation Systems combine nitrogen blow down with vortex motion and heat.

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

DAIRY, FOOD AND ENVIRONMENTAL

# Sanitation

International Association for Food Protection

## Articles



## Association News



## Departments



## Extras

# THE BLACK PEARL AWARD

RECOGNITION FOR CORPORATE EXCELLENCE IN FOOD SAFETY AND QUALITY


## NOMINATE TODAY!

The Black Pearl Award is presented annually at the International Association for Food Protection Annual Meeting.

The Black Pearl Award, sponsored by Wilbur Feagan and F&H Food Equipment Company, was first presented in 1994. The Black Pearl Award was established to recognize a company for outstanding commitment to and achievement in corporate excellence in food protection. For more information and to receive nomination criteria, contact the International Association for Food Protection office at 800.369.6337 or 515.276.3344; Fax: 515.276.8655; E-mail: info@foodprotection.org.

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

International Association for
Food Protection

6200 Aurora Avenue, Suite 200W
Des Moines, IA 50322-2863, USA
Phone: 800.369.6337 • 515.276.3344
Fax: 515.276.8655
E-mail: info@foodprotection.org
Web site: www.foodprotection.org



DAIRY, FOOD AND ENVIRONMENTAL

# Sanitation

A PUBLICATION OF THE INTERNATIONAL ASSOCIATION FOR FOOD PROTECTION

***Dairy, Faad and Enviranmental Sanitatian*** (ISSN-1043-3546) is published monthly beginning with the Jonuory number by the Internotionol Associotion for Food Protection, 6200 Auroro Avenue, Suite 200W, Des Moines, Iowo 50322-2863, USA. Eoch volume comprises 12 numbers. Printed by Heuss Printing, Inc., 911 N. Second Street, Ames, Iowo 50010, USA. Periodicol Postoge poid ot Des Moines, Iowo 50318 ond odditionol entry offices.

**Manuscripts:** Correspondence regarding monuscripts should be oddressed to Donno A. Bohun, Production Editor, Internotionol Associotion for Food Protection.

**News Releases, Updates, Coming Events and Caver Phatas:** Correspondence for these moteriols should be sent to Donno A. Bohun, Production Editor, Internotionol Associotion for Food Protection.

**"Instructians far Authars"** moy be obtoined from our Web site ot www.foodprotection.org or from Donna A. Bohun, Production Editor, Internotionol Associotion for Food Protection.

**Orders far Reprints:** All orders should be sent to ***Dairy, Faad and Enviranmental Sanitatian,*** Internotionol Associotion for Food Protection. Note: Single copies of reprints ore not ovoiloble from this oddress; oddress single copy reprint requests to principol outhor.

**Reprint Permissian:** Questions regarding permission to reprint ony portion of ***Dairy, Faad and Enviranmental Sanitatian*** should be oddressed to: Donno A. Bohun, Production Editor, Internotionol Associotion for Food Protection.

**Business Matters:** Correspondence regarding business motters should be oddressed to Lisa K. Hovey, Monoging Editor, Internotionol Associotion for Food Protection.

**Membership Dues:** Membership in the Associotion is ovoiloble to individuols. Dues include o 12-month subscription to ***Dairy, Faad and Enviranmental Sanitatian*** ot o rote of $85.00 US, $95.00 Conodo/Mexico, ond $110.00 Internotionol. Dues including ***Dairy, Faad and Enviranmental Sanitatian*** ond the ***Jaurnal af Faad Pratectian*** ore $140.00 US, $165.00 Conodo/Mexico, ond $210.00 Internotionol. Student memberships ore ovoiloble with verificotion of student stotus. Student rotes ore $42.50 US, $52.50 Conodo/Mexico, ond $67.50 Internotionol for ***Dairy, Faad and Enviranmental Sanitatian***; $42.50 US, $57.50 Conodo/Mexico, ond $87.50 Internotionol for ***Jaurnal af Faad Pratectian***; ond $70.00 US, $95.00 Conodo/Mexico, ond $140.00 Internotionol for ***Dairy, Faad and Enviranmental Sanitatian*** ond ***Jaurnal af Faad Pratectian***. All membership dues include shipping ond handling. No concellotions occepted. Correspondence regarding chonges of oddress ond dues must be sent to Julie A. Cottonoch, Membership Services, Internotionol Associotion for Food Protection.

**Sustaining Membership:** A sustoining membership in the Associotion is ovoiloble to componies ot o rote of $525.00 per yeor. For more informotion, contoct Julie A. Cottonoch, Membership Services, Internotionol Associotion for Food Protection.

**Subscriptian Rates:** ***Dairy, Faad and Enviranmental Sanitatian*** is ovoiloble by subscriptian for $185.00 US, $195.00 Conodo/Mexica, and $210.00 Internotional. Single issues ore ovoiloble for $24.00 US ond $33.00 oll other countries. All rotes include shipping ond handling. No concellotions occepted. For more informotion contoct Julie A. Cottonoch, Membership Services, Internotionol Associotion for Food Protection.

**Claims:** Notice of foilure to receive copies must be reported within 30 doys domestic, 90 doys outside US.

**Pastmaster:** Send oddress chonges to ***Dairy, Faad and Enviranmental Sanitatian,*** 6200 Auroro Avenue, Suite 200W, Des Moines, Iowo 50322-2863, USA.

***Dairy, Faad and Enviranmental Sanitatian*** is printed on poper thot meets the requirements of ANSI/NISO 239.48-1992.

## *SPONSORSHIPS*

We invite you to participate as a sponsor for the 2000 Annual Meeting. Sponsorship participation provides an excellent opportunity to position your company or organization as a supporter of the Association.

Several exciting opportunities will be available in 2000. Please review the event listing to select the one that will best position your organization. Reservations will be taken in order received for any open sponsorship activities.

### SPONSORSHIP EVENT LIST

| Full Support | Partial Support | Event |
|---|---|---|
| $15,000 | $ 4,000 - $ 9,000 | Evening Social Event (Monday) |
| $12,000 | $ 4,000 - $ 7,000 | Opening Reception Wine (Sunday) |
| $12,000 | $ 4,000 - $ 6,000 | Exhibit Hall Reception (Monday) |
| $ 7,500 | $ 2,500 - $ 4,000 | Leather Badge Holders w/Lanyards |
| $ 4,000 | $ 1,500 - $ 2,500 | Exhibit Hall Pastries/Coffee (Monday) |
| $ 4,000 | $ 1,500 - $ 2,500 | Exhibit Hall Pastries/Coffee (Tuesday) |
| $ 3,000 | $ 1,000 - $ 1,500 | Refreshment Break (Wednesday) |
| $ 3,000 | $ 1,000 - $ 1,500 | New Member Orientation (Saturday) |
| $ 2,000 | $ 750 - $ 1,000 | Exhibitor Move in Refreshments (Sunday) |
| $ 1,500 | $ 500 - $ 800 | Awards Banquet Flowers (Wednesday) |
| $ 1,500 | $ 500 - $ 800 | Committee Day Refreshments (Sunday) |
| $ 1,000 | $ 400 - $ 750 | Speaker Travel Support |
| $ 600 | $ 150 - $ 300 | Golfers' Continental Breakfast (Sunday) |
| $Various | $ 75 - $ 300 | Golf Tournament Prizes (Sunday) |

Name _____

Company _____

Address _____

City _____ State or Province _____

Country _____ Postal Code/Zip +4 _____

Phone _____ Fax _____

E-mail _____

Desired Event to Sponsor _____

**Mail to:** International Association for Food Protection
6200 Aurora Avenue, Suite 200W
Des Moines, IA 50322-2863, USA

**Phone:** 800.369.6337; 515.276.3344
**Fax:** 515.276.8655

# Future Annual Meetings

**2000**

**August 6-9**

Hilton Atlanta
Atlanta, Georgia

**2001**

**August 5-8**

Hilton Minneapolis
Minneapolis, Minnesota

**2002**

**June 30-July 3**

Hyatt Regency
San Diego
San Diego, California

DAIRY, FOOD AND ENVIRONMENTAL
# Sanitation

International Association for Food Protection



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

## *DFES* EDITORIAL BOARD

# SustainingMembers

**3-A Symbol Council,** 1500 Second Ave., SE, Suite 209, Cedar Rapids, IA 52403; 319.286.9221

**3M Microbiology Products,** 3M Center, Bldg. 275, St. Paul, MN 55144-1000; 612.733.9558

**ABC Research,** 3437 S.W. 24th Ave., Gainesville, FL 32607; 352.372.0436

**Advanced Instruments, Inc.,** Two Technology Way, Norwood, MA 02062; 781.320.9000

**Anderson Instrument Co.,** 156 Auriesville Road, Fultonville, NY 12072; 518.922.5315

**ASI Food Safety Consultants, Inc.,** 7625 Page Blvd., St. Louis, MO 63133; 800.477.0778

**Audits International,** 1899 Second St., Highland Park, IL 60035-3113; 847.433.0900

**Becton Dickinson Microbiology Systems, Inc.,** 7 Loveton Circle, Sparks, MD 21152-9212; 410.584.8959

**Bentley Instruments, Inc.,** 4004 Peavey Road, Chaska, MN 55318; 612.448.7600

**BioControl Systems, Inc.,** 12822 SE 32nd St., Bellevue, WA 98005; 425.603.1123

**Biolog, Inc.,** 3938 Trust Way, Hayward, CA 94545; 510.785.2564

**bioMérieux, Inc.,** 595 Anglum Road, Hazelwood, MO 63042-2320; 800.638.4835

**Capitol Wholesale Meats,** 911 W. 37th Pl., Chicago, IL 60609-1412; 773.890.0600

**Capitol Vial, Inc.,** 4525 E. Skyline, Suite 105, Tucson, AZ 85718-1600; 602.529.0788

**Chr. Hansen, Inc.,** 9015 W. Maple St., Milwaukee, WI 53214; 414.607.5700

**CIAD A.C.,** Carr. A La Victoria Km 0.6, Hermosillo, Sonora MEXICO 83000; 52.62.80.0057

**Cogent Technologies Ltd.,** 11140 Luschek Dr., Cincinnati, OH 45241; 513.469.6800

**DQCI Services, Inc.,** 5205 Quincy St., Mounds View, MN 55112-1400; 612.785.0484

**DARDEN Restaurants,** P.O. Box 593330, Orlando, FL 32859-3330; 407.245.5330

**Darigold, Inc.,** 635 Elliott Ave. W., P.O. Box 79007, W. Seattle, WA 98119; 206.286.6772

**Dean Foods,** P.O. Box 7005, Rockford, IL 61101-7005; 815.962.0647

**Decagon Devices,** 950 N.E. Nelson Court, P.O. Box 835, Pullman, WA 99163; 509.332.2756

**DiverseyLever DuBois,** 255 E. Fifth St., Suite 1200, Cincinnati, OH 45202-4799; 513.762.6794

**DonLevy & Associates, Inc.,** 1551 E. 89th Ave., Merrillville, IN 46410; 219.736.0472

**DSM Food Specialties,** N89 W14475 Patrita Dr., Menomonee Falls, WI 53051; 414.255.7955

**Dynal, Inc.,** 5 Delaware Dr., Lake Success, NY 11042; 516.326.3270

**Eaton Hall Expositions,** 256 Columbia Turnpike, Florham Park, NJ 07932; 800.746.9646

**Ecolab, Inc.,** 370 Wabasha St. N., St. Paul, MN 55102; 612.293.2364

**Educational Foundation of the National Restaurant Assn.,** 250 S. Wacker Dr., Suite 1400, Chicago, IL 60606-3834; 800.765.2122

**Electrol Specialties Company,** 441 Clark St., South Beloit, IL 61080; 815.389.2291

**Evergreen Packaging,** Division of International Paper, 2400 6th St., S.W., Cedar Rapids, IA 52406; 319.399.3236

**F & H Food Equipment Co.,** P.O. Box 3985, Springfield, MO 65808; 417.881.6114

**FoodHandler,** 514 Grand Blvd., Westbury, NY 11590; 800.338.4433

**Foss North America, Inc.,** 7682 Executive Dr., Eden Prairie, MN 55344-3677; 612.974.9892

**FRM Chem, Inc.,** P.O. Box 207, Washington, MO 63090; 314.583.4360

**Gardex Chemicals Ltd.,** 7 Meridian Road, Etobicoke, ON M9W 4Z6; 800.563.4273

**GENE-TRAK Systems,** 94 South St., Hopkinton, MA 01748; 508.435.7400

**Glo Germ Company,** 150 E. Center St., Moab, UT 84532-2430; 800.842.6622

**Great Western Chemical Co.,** 1717 E. Fargo, Nampa, ID 83687-6827; 208.466.8437

**IBA, Inc.,** 27 Providence Road, P.O. Box 31, Millbury, MA 01527; 508.865.6911

**IDEXX Laboratories, Inc.,** One Idexx Dr., Westbrook, ME 04092; 207.856.0300

# Sustaining Members

**Innovative Cleaning Equipment,** 4445 44th St., Grand Rapids, MI 49512; 616.285.6055

**International BioProducts, Inc.,** P.O. Box 0746, Bothell, WA 98041-0746; 425.398.7993

**International Dairy Foods Association,** 1250 H St. N.W., Suite 900, Washington, D.C. 20005; 202.737.4332

**J. J. Keller & Associates,** 3003 W. Breezewood Lane, Neenah, WI 54957-0368; 920.720.7625

**KenAg Inc.,** 101 E. 7th St., Ashland, OH 44805; 800.338.7953

**Kraft Foods, Inc.,** 801 Waukegan Road, Glenview, IL 60025; 847.646.3678

**Land O'Lakes, Inc.,** P.O. Box 64101, St. Paul, MN 551640101; 612.481.2870

**Malthus Diagnostics, Inc.,** 35888 Center Ridge Road, North Ridgeville, OH 44039; 440.327.2585

**Medallion Labs,** 9000 Plymouth Ave., Minneapolis, MN 55427; 612.764.4453

**Michelson Laboratories, Inc.,** 6280 Chalet Dr., Commerce, CA 90040; 562.928.0553

**NSF International,** 789 Dixboro Road, Ann Arbor, MI 48105; 764.769.8010

**NASCO International,** 901 Janesville Ave., Fort Atkinson, WI 53538; 414.563.2446

**The National Food Laboratory,** 6363 Clark Ave., Dublin, CA 94568; 510.551.4231

**National Food Processors Association,** 1350 I St. N.W., Suite 300, Washington, D.C. 20005-3305; 202.639.5985

**Nelson-Jameson, Inc.,** 2400 E. Fifth St., P.O. Box 647, Marshfield, WI 54449-0647; 715.387.1151

**Neogen Corporation,** 620 Lesher Place, Lansing, MI 48912; 517.372.9200

**NESTLÉ USA, Inc.,** 800 N. Brand Blvd., Glendale, CA 91203; 818.549.5799

**Organon Teknika Corp.,** 100 Akzo Ave., Durham, NC 27712; 919.620.2000

**Oxoid, Inc.,** 217 Colonnade Road, Nepean, Ontario, Canada K2E 7K3; 800.567.8378

**PE Applied Biosystems,** 850 Lincoln Centre Dr., Bldg. 400, Foster City, CA 94404; 650.638.5413

**Penn State University,** University Creamery, 12 Borland Laboratory, University Park, PA 16802; 814.865.7535

**PestWest Electronics Ltd.,** Denholme Drive, Ossett, West Yorkshire, England WF5 9NB; 44.1924.277631

**PRISM Integrated Sanitation Management,** 8300 Executive Center Dr., Miami, FL 331664680; 305.592.6312

**Process Tek,** 1991 Big Bend Dr., Des Plaines, Il 60016; 847.296.9312

**Qualicon, A DuPont Subsidiary,** P.O. Box 80357, Wilmington, DE 19880-0357; 302.695.2262

**R-Tech,** P.O. Box 64101, St. Paul, MN 55164-0101; 800.328.9687

**Raven Biological Labs,** 8607 Park Dr., Omaha, NE 68127; 402.593.0781

**REMEL, Inc.,** 12076 Santa Fe Dr., Lenexa, KS 66215-3594; 800.255.6730

**Rhodia, Inc.,** P.O. Box 592, Madison, WI 53701; 800.356.9393

**Rochester Midland Corp.,** 333 Hollenbeck St., Rochester, NY 14621; 716.336.2360

**Ross Laboratories,** 3300 Stelzer Road, Columbus, OH 43219; 614.624.3785

**Seiberling Associates, Inc.,** 94 North High St., Suite 350, Dublin, OH 43017-1100; 614.764.2817

**Seward Limited,** 98 Great North Road, London, N2 0GN United Kingdom; 44.0.181.365.4104

**Silliker Laboratories Group, Inc.,** 900 Maple Road, Homewood, IL 60430; 708.957.7878

**Universal Sanitizers & Supplies, Inc.,** P.O. Box 50305, Knoxville, TN 37950; 423.584.1936

**Warren Analytical Laboratory,** 650 'O' St., P.O. Box G, Greeley, CO 80632-0305; 800.945.6669

**Weber Scientific,** 2732 Kuser Road, Hamilton, NJ 08691-9430; 609.584.7677

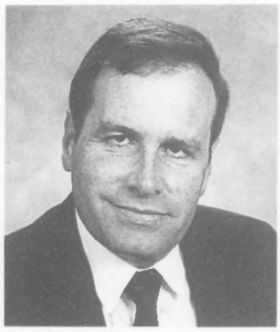
**West Agro, Inc.,** 11100 North Congress Ave., Kansas City, MO 64153; 816.891.1528

**Zep Manufacturing Co.,** 1310 Seaboard Industrial Blvd., Atlanta, GA 30318; 404.352.1680

**Zylux Corporation,** 1742 Henry G. Lane St., Maryville, TN 37801; 423.379.6016

# QUOTATIONS

## FROM JACK



By JACK GUZEWICH
President

"An update on the status of implementing the goals we set in 1997"

One thing I did not fully appreciate until I became a member of the Executive Board was how much it takes to run an Association! With a staff of twelve people, publication of two monthly journals, a four-day Annual Meeting that attracts over 1,200 people and the numerous Member services we provide, there is a lot going on and more details than you want to know about. We also are very much involved in long-range planning for the organization. At our spring meeting in 1997 we updated a long-range plan that had been developed in 1993. This column is an update on the status of implementing the goals we set in 1997.

### Membership

Our Association had been experiencing an annual attrition rate of 18% in 1997, which is typical for an association like ours. Our goal was to reduce that number to 15%, but so far we hang at 18% in spite of some different approaches we have tried. We have seen an increase in total International (outside North America) and North American Members such that our overall Membership has grown from 2,793 in 1997 to 3,002. This is not bad given the attrition rate. We also have been seeking to increase Sustaining Membership, an important way to hold down individual Member dues. Sustaining Membership has remained constant, in spite of the large number of consolidations that have occurred in the industry. Thanks go out to all of our Sustaining Members for their support. We really need the help of every Member to encourage existing Members to remain Members, to solicit new Members and to encourage additional firms to become Sustaining Members. Our staff has been developing new recruiting brochures and information that they will gladly send you upon request. Please give them a call or send an E-mail for any assistance.

### Member Services

Much of what we have done new is electronic in one way or another. Our new Web page is up and running at foodprotection.org. You will be able to register for the Annual Meeting, renew Membership, order booklets and 3-A publications online by March. Both the *Journal of Food Protection* and *Dairy, Food and Environmental Sanitation* have information available online. Abstract submission was available for the 2000 Annual Meeting. Sustaining Members have been offered a link from our Web page to theirs at no charge. All of these concepts were called for in our 1997 plan.

### Education

One service we try and provide to authors who submit manuscripts for publication in one of our journals is rapid turn-around times from first receipt of the manuscript through the review process to publication. Our goal was to have our average turn-around time be four months. Unfortunately, we are running closer to five months average. Two

of the reasons we are having a hard time making the time shorter relate to the authors themselves. We often wait a long time to receive corrected manuscripts back from authors after the review has been done. Another problem we have had is receiving page charges from authors before publication. We had to go to a system of collecting page charges up front as we were having difficulty collecting them after publication. We set another goal of conducting a reader survey of readers of both journals. Our current plans call for this to happen in the fall of this year. We set goals to increase attendance at our Annual Meeting. We had 1,030 attendees in 1997 (Orlando), 1,152 in 1998 (Nashville) and 1,131 in 1999 (Dearborn). Our goal for 2000 is 1,200 attendees and I think we will make it given the location, program, name change attracting new interest, and growing recognition of the value in attending our Meeting. Annual Meeting exhibitors have grown from 76 in 1997, to 84 in 1998, to 85 in 1999 and an expected 90 in 2000. We set the goal of seeking sponsorships for functions at the Annual Meeting, a good way to hold down ticket costs while giving sponsors added opportunities for recognition. I am very pleased to report that sponsorship has grown from $0 in 1997, to $10,000 in 1998 and over $25,000 in 1999. We expect to exceed $30,000 in sponsorships at our 2000 Meeting. Many thanks to our sponsors for their generosity. Our goal has been to hold two workshops at the Annual Meeting and two to three stand-alone workshops during the year. We met the goal at the Annual Meeting and have been doing one stand-alone workshop per year. We have some good ideas for stand-alone workshops, but they require further development for us to meet our goal.

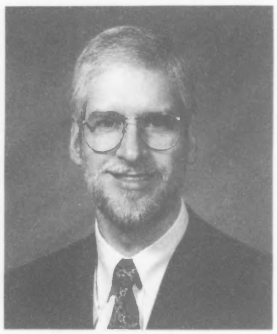
**Operations**

Plans were developed and implemented by the staff and the Board to assure that we operate effectively and efficiently. We set and have met the goal of assuring ongoing training of our staff, our most valuable resource. We established a computer rotation system e.g. leasing, in the office to keep the office up to date and functioning smoothly. We developed a system to update Board and office policies annually. The office staff organization has been realigned to empower the staff and to assure efficient operation.

None of these activities could have happened without the dedication and hard work put forth by our Executive Director, David Tharp, and the staff: (Lisa Hovey, Assistant Director; Donna Bahun, Design and Layout; Julie Cattanach, Membership Services; Lucia Collison, Association Services; Bev Corron, Public Relations; Karla Jordan, Order Processing; Didi Sterling Loynachan, Administrative Assistant; Beth Miller, Accounting Assistant, Pam Wanninger, Proofreader; Tanya Wheeler, Audiovisual Library Coordinator; and Frank Zuehlke, Senior Accountant). David's efforts are further demonstrated by his seeking and receiving recognition as a Certified Association Executive (CAE) from the American Society of Association Executives. Congratulations David! Speaking for the Board and myself, we are very proud of how our Association has matured in the last three years and we feel confident that things will continue to get even better in the future.

# COMMENTARY

## FROM THE EXECUTIVE DIRECTOR



By DAVID W. THARP, CAE
Executive Director

"By changing the Association name, we are not ignoring any segment of our Membership population"

Many times throughout the year, we receive requests from Members wanting to become more involved with our Association. Sometimes the person is interested in serving on a Committee or a Professional Development Group (PDG) or they may be interested in giving a presentation at the Annual Meeting. This month, I thought we could cover ways in which you can expand your professional growth through the International Association for Food Protection.

One item to point out before going any further is that the Association focus is just the same as when our name was the International Association of Milk, Food and Environmental Sanitarians! By changing the Association name, we are not ignoring any segment of our Membership population. Just the opposite – we need and encourage everyone's continued involvement. Although we have a new name, our mission remains the same, "to provide food safety professionals worldwide with a forum to exchange information on protecting the food supply."

The manner in which we carry out our mission is a direct result of our Members' involvement. The Association journals, *Dairy, Food and Environmental Sanitation* and the *Journal of Food Protection*, provide an excellent forum to exchange information on protecting the food supply. International Association for Food Protection Members submit articles to be peer reviewed and accepted for publication. Last year, we had a record number of submitted manuscripts for both journals and we commend each and every author for their active support of our journals and the Association. You are invited to submit articles and participate in "Advancing Food Safety Worldwide!"

Another obvious way we fulfill our mission is through the Annual Meeting. More than 250 presentations on the latest developments in food safety and protection take place during the Meeting. Again, we rely on our Members and food safety professionals to provide cutting-edge scientific information to the attendees. This is an excellent way to expand your professional growth. During the Annual Meeting, the exhibit hall also is a resource for attendees to meet with equipment, laboratory and industry suppliers and provides a friendly environment to network with colleagues. Here again, we owe a compliment to so many people who come together to make the Annual Meeting an overwhelming success.

If you find that you are unable to attend the Annual Meeting, or giving presentations during the Meeting is not your strong point, Committee service may be for you. We have a number of Committees and PDGs that meet at the Annual Meeting and conduct business throughout the year that you can volunteer to be involved with. What better way to share your knowledge with other food safety professionals? Feel free to contact the Association office for more information on Committee service. We welcome your involvement!

As I said earlier, our mission remains the same although our

name has changed. Both the journals and our Annual Meeting will continue to carry the most current topics in food safety that you have come to rely on. We are here to serve the information needs of our Members and without you, and your direction to us, there would not be a need for our Association! We believe changes are made for reasons that are well-thought out and all input is considered during the decision-making process. Our name change is but one example of the extreme analysis to which the Executive Board goes through before making decisions.

Before we conclude for this month, let me cover one area where we are fortunate to have so many fine individuals willing to give of their time and be involved. That is of course, those who are elected to serve on the Executive Board. In this issue of *DFES*, the Secretary candidates for 2000-2001 are announced on page 132. By placing their names in the running for Secretary, the candidates have committed to serving the International Association for Food Protection for a period of five years on the Executive Board. This is a huge commitment and one that should be recognized by all Members. Reviewing the list of Past Presidents of the Association is like a "Who's Who" list of food safety professionals. This may be a lofty goal for you to set, but in the future, it could be your picture in *DFES* as a candidate for Secretary! It can happen if you resolve to become involved in the Association today!

*Dairy, Food and Environmental Sanitation, Vol. 20, No. 2, Pages 114-119*


# Food Protection: New Developments in Handwashing

Anne K. Taylor


## SUMMARY

Foodborne illness is a serious problem that is receiving increased attention from government, industry, and consumer groups. The first line of defense against disease is frequent handwashing by foodhandlers. This article is a review of recent handwashing research, with special emphasis on handwashing for food protection.

A number of products are available to aid in the fight against foodborne illness. All handwashing reduces the bacteria on the hands, and antiseptic handwash products can further reduce the bacteria, some with a long-lasting effect. Instant hand sanitizers are useful when washing is not possible but do not have a lasting effect. Topical barrier products (protective creams/lotions) may be used as a supplement to handwashing. In compliance with the 1999 Food Code, gloves may be used to prevent contact between foodhandlers and food. However, gloves may leak, and natural rubber latex gloves may cause serious allergies. In addition, germs flourish in the warm, moist environment under the gloves. One solution to this problem is the use of a protective, antiseptic lotion under the gloves.


## INTRODUCTION

In September 1997, eighteen people who had attended the same party in Florida were sickened by a disease diagnosed as food poisoning from staphylococcal enterotoxin type A. Health Department investigators found that all the victims had eaten ham that had not been cooled quickly, thus allowing bacteria to grow and produce enough toxin to cause illness. The ham was apparently contaminated by the food preparer's hands and by contact with a meat slicer that had not been cleaned properly *(6)*.

For the food service industry, such an outbreak of foodborne illness is more than an inconvenience. The National Restaurant Association (NRA) estimates that an outbreak could cost a restaurant as much as $75,000 – more if there is death or serious injury *(2)*. In response to the dangers of foodborne illness, the NRA's Educational Foundation offers ServSafe, a training course in food safety. ServSafe teaches that the factors in foodborne illness fall into three categories: time and temperature abuse, poor personal hygiene, and cross contamination. The hands of food service employees can be the vectors in the spread of disease because of poor personal hygiene or cross contamination. For example, an employee might con-

taminate his hands when using the toilet, or bacteria might be spread from raw meat to salad greens by an employee's hands.

To prevent this type of contamination, the 1999 Food Code, from the Food and Drug Administration (FDA), requires employees to wash their hands and arms for 20 seconds *(15)* before handling food and between different activities. The 1999 Food Code also requires that there be no direct hand contact of foods that are ready to eat:

> "...Food employees may not contact exposed, ready-to-eat food with their bare hands and shall use suitable utensils such as deli tissue, spatulas, tongs, single-use gloves, or dispensing equipment... Food employees shall minimize bare hand contact with exposed food that is not in a ready-to-eat form" *(15)*.

Handwashing remains the most effective way to prevent the spread of disease, and this review will focus on new developments in handwashing – the use of antiseptics, instant hand sanitizers, and protective lotions – and on the limitations of gloves for food protection. Handwashing products that contain an antiseptic to reduce the germs on the hands are regulated under the FDA tentative final Monograph for Health Care Antiseptic Drug Products *(14)*, which defines three categories of hand wash products: patient preoperative products, surgical hand scrub products, and health care personnel hand wash products. Recognizing that the monograph is limited to medical applications, the Cosmetic, Toiletries, and Fragrance Association (CTFA) has proposed more extensive standards, known as the Healthcare Continuum Model *(8)*. The Model defines additional categories of products: foodhandler handwash, antimicrobial handwash, and antimicrobial bodywash. The latter two categories are for consumer use; the others are for professional use.

This article will survey the overlapping topics of foodhandler and healthcare personnel handwashes. Much of the research reviewed here is of medical origin and involves surgical scrubbing as well as patient care, but this research is still relevant to food handling. The topic of handwashing was thoroughly surveyed in an article introducing handwashing guidelines for medical professionals, from the Association for Professionals in Infection Control and Epidemiology, Inc. (APIC) *(26)*. In addition, the issue of handwashing versus gloving was discussed from a foodservice perspective by Fendler, Dolan, and Williams *(17)*.

## ANTISEPTIC HANDWASHING PRODUCTS

For the food industry worker, the most important way to reduce the spread of foodborne illness is also the simplest and least expensive – frequent handwashing. The possibility of illness spread by food contact has been confirmed in many studies, such as the 1971 report *(37)* in which *Salmonella* was shown to survive on fingertips, even after handwashing, and to be passed onto samples of meat. Numerous handwashing products are available, and some contain antimicrobial ingredients to reduce the number of bacteria on the hands. (The terms antiseptic, antibacterial, and antimicrobial will be considered equivalent as used in this review.) It has been shown that even non-antibacterial soaps can significantly reduce the amount of bacteria on hands, presumably by physical removal of the bacteria *(44)*. However, in one medical study, washing with a non-antibacterial (bland) soap did not prevent transfer of bacteria to medical devices, such as catheters *(12)*. Reduction in transferable bacteria may be improved by use of an antibacterial chemical in the soap/detergent or in a rinse or dip *(38)*. The most frequently used antiseptics are:

- Alcohols. The alcohols ethanol and iso-propanol, at levels of 62-72%, have long been used for preparation for surgery *(26)*. Alcohol products are now available to both professionals and the public as instant hand sanitizers. Alcohols can kill large numbers of microbes instantly, but their antibacterial properties are only temporary. Alcohols also have a drying effect on the skin. However, the instant hand sanitizers generally contain emollients and skin conditioners to counteract this effect.
- Iodine and iodophors. Iodine-containing ingredients for handwash and surgical scrub products are iodophors, complexes of iodine with a carrier such as polyvinylpyrrolidone (PVP). Although highly effective, the iodine is very irritating and may cause allergic reactions *(26)*. Iodine products include hand dips as well as washing products.
- Chlorhexidine gluconate. Used in both surgical scrubs and hand wash products, chlorhexidine gluconate (CHG) has a broad spectrum of activity, being effective against both gram positive and gram negative bacteria. It is generally considered to have a six hour residual activity *(10)*. CHG is usually used at a level of 2 to 4% in a detergent base *(26)*.
- Chloroxylenol. The phenolic antiseptic, chloroxylenol (para-chloro-meta-xylenol, or PCMX) is less active than CHG, but its activity persists over several hours *(26, 35)*. Reports of its effectiveness vary, because the efficacy of PCMX, like that of CHG, is highly formula dependent *(26)*. Product formulated with surfactants that inhibit the activity of PCMX were found to be no more effective than a non-antimicrobial handwashing product *(40,*

*41)*. However, in other formulations, PCMX at concentrations of 0.3% to 2.5% was highly effective *(16, 35, 36)*. In addition, the effectiveness of PCMX against *Pseudomonas* species was greatly enhanced when EDTA (ethylenediamine tetraacetic acid) was incorporated into the formulation *(9)*.

- Triclosan. Another phenolic compound, triclosan (5-chloro-2-[2,4-dichlorophenoxyl]phenol), is used in consumer products such as deodorants, dishwashing liquids, and bar soaps, as well as handwashing products for healthcare and foodservice environments. It is generally used in concentrations of 0.1% to 1.0% and has a broad spectrum of activity against both gram positive and gram negative bacteria *(4, 26)*. Like PCMX, triclosan provides good immediate and persistent effects when formulated with non-inhibiting ingredients.

Researchers at Tufts University School of Medicine *(28, 39)* reported that triclosan blocks lipid synthesis in bacteria, similar to the biocidal mechanism of some antibiotics. Thus, in the same way that some bacteria have become resistant to antibiotics, antiseptic-resistant strains might develop. However, no resistance to antiseptics has been reported outside the laboratory. There are a number of reports on the efficacy of triclosan-containing products in reducing or eliminating Methicillin-resistant *Staphylococcus aureus* (MRSA) outbreaks in hospital settings *(5, 45, 47)*.

A number of studies have compared the effectiveness of antiseptic ingredients. For example, when hands were exposed to contaminated meat and then washed, iodophor and CHG were the most effective agents in reducing the bacterial count on the hands *(41)*. Similar results were obtained under in-use conditions in a meat processing plant *(44)*, but workers found the iodophor products objectionable. When a strong antiseptic (2.5% PCMX) product was compared to an alcohol hand sanitizer, the alcohol initially reduced the bacterial count more, but its effectiveness decreased with multiple applications *(36)*. The PCMX product, however, produced greater reduction with each use. A second study using a variety of products gave similar results *(29)*.

## INSTANT HAND SANITIZERS

A number of waterless hand sanitizing products, such as Dial, Lysol, and Purell® instant hand sanitizers, are now available. These products kill germs with alcohol and may contain emollient ingredients to counteract the drying effect of the alcohol. The 1999 Food Code allows the use of such products by food handlers under certain conditions *(15)*. These products may be a supplement to regular handwashing, especially when workers are unable to wash with soap and water. It has been suggested that alcohol hand sanitizers may increase handwashing compliance, especially in a healthcare setting, because less time is required to clean the hands *(46)* and less skin irritation occurs *(31)*.

Considerable evidence exists, especially in the infection control literature *(25, 26)*, for the effectiveness of alcohol hand sanitizers. However, some experimental evidence is mixed, perhaps because of differences in the reliability of the measurement techniques used and the interpretation of the data *(34)*. For example, in a study *(18)* comparing different combinations of gloving and handwashing to protect the hands from *E. coli*-contaminated meat, bare hands with hourly washing and sanitizing with alcohol had the lowest microbial levels, and low levels were achieved with alcohol alone in spite of the necessity for hand washing due to the physical soil from the meat. One study concluded that bacteria increased after an alcohol hand sanitizer *(29, 34)* was used; however, other studies have shown that an alcohol sanitizer causes large decreases in both transient and resident bacteria *(36)*. Numerous studies have shown that effectiveness of alcohol hand sanitizers does not change with repeated use. However, one recent study found that effectiveness decreased with repeated use, while another sanitizer, which contained benzalkonium chloride, allantoin, and a surfactant, gave increasing effectiveness under the same conditions *(11)*.

## SKIN PROTECTIVE PRODUCTS

Skin protective drug products include creams, lotions, and foams that form a protective film (barrier) over the skin. The FDA *(13)* defines "skin protectants" as products that contain one or more of a list of ingredients including glycerin and dimethicone. The silicone oil dimethicone coats the skin with a protective film that is resistant to water-based and some oil-based substances *(21)*. Although these products are intended to protect hands from dryness, several studies have shown that they also reduce the release of microorganisms from hands. For example, Sheena and Stiles found that applying a barrier cream after washing with a non-antibacterial soap reduced the number of bacteria released from fingertips as much as an iodophor did *(42)*.

Emollient/protective lotions may act in another way to reduce the spread of disease: In two whole-body studies, lotions reduced the amount of skin shedding and actually slowed the growth of bacteria on the skin. In the first study *(20)*, application of a skin lotion (non-antiseptic) to the body after showering greatly reduced the number of bacteria and skin scales dispersed from 10 men and 10 women, an effect that lasted for at least four hours. The subjects in the second study *(1)* showered with either a plain soap or an antiseptic soap and then applied an emollient lotion

(non-antiseptic) to one side of the body. When bacterial counts were taken 4 hours later, the number of colonies was 54% lower for the antiseptic side and 93% lower for the antiseptic-lotion side. The data suggest that the emollient has an antimicrobial effect that is enhanced when it is combined with an antiseptic.

Some topical barrier products, contain both emollient and antimicrobial ingredients. The protective film keeps the antimicrobial substance in contact with the skin; extending the time during which it can continue to kill microbes. SAFE-SHIELD™ (DermaGuard, Inc.) contains PCMX (chloroxylenol), a phenolic antimicrobial agent, and many similar products contain triclosan. HAND MEDIC Antiseptic Skin Treatment™ (GOJO Industries, Inc.) contains benzalkonium chloride as the active ingredient. Products such as these provide three benefits to the user: a persistent antimicrobial effect, a protective barrier, and moisturizing.

## LIMITATIONS OF GLOVE USE

Since the AIDS scare of the 1980s, the use of gloves by healthcare workers has increased dramatically, and glove use has now spread into other fields. As discussed, the 1999 Food Code requires that there be no direct hand contact with ready-to-eat-food, and this requirement necessitates the use of gloves for many operations *(15)*.

The APIC Guidelines emphasize that "gloves should be used as an adjunct to, not a substitute for, handwashing" *(26)*. Furthermore, increased glove use has revealed their limitations as protective devices. In one hospital study, 85% of used vinyl gloves and 18% of used latex gloves had physical leaks after use *(22)*. In another study, 63% of used vinyl gloves and 7% of used latex gloves allowed virus to leak into them *(23)*. Because germs can grow in the warm, moist environment inside the gloves, it is important to wash the hands with an antimicrobial product before gloving and when the gloves are removed *(24)*.

Although latex gloves may be stronger and more resistant to penetration, than vinyl gloves, latex is the source of a serious health threat–latex allergy. The National Institute of Occupational Health and Safety (NIOSH) has surveyed the scientific literature and reports that 1% to 5% of the general population and 8% to 12% of healthcare workers are sensitized to latex *(32)*. Sensitized persons experience symptoms ranging from a mild dermatitis (rash) to asthma to anaphylactic shock and possibly death. Latex gloves are made from natural rubber, which may contain traces of proteins; these proteins trigger the allergic response in sensitized persons. The powder used in some gloves may absorb the proteins and spread them into the air, thus increasing exposure.

An article in the American Journal of Nursing *(19)* differentiates between the three types of reactions to natural rubber latex: (1) Contact dermatitis is an irritant reaction to the chemicals used during the processing of the latex. This dermatitis, characterized by skin redness and itching, is not a true allergy and may be relieved by using a different type of latex glove; (2) Type IV hypersensitivity is a cell-mediated allergic reaction to the chemicals used during the processing of latex. This type of sensitivity may cause delayed reactions (one to 48 hours after exposure) that include redness, itching, hives, or swelling. The Type IV reaction may lead to the more serious Type I reaction; and (3) Type I hypersensitivity is a true allergy (an IgE mediated response) that is potentially life threatening. A wide variety of symptoms may occur, up to and including respiratory and cardiac arrest. Some Type I patients may become so sensitive that they can react to balloons and other common latex items.

Latex allergy has become such a serious problem that NIOSH *(32, 33)* and other organizations, such as American Academy of Dermatology *(7)*, Association of Operating Room Nurses *(43)*, and Emergency Nurses Association *(3)*, have issued statements and calls for its prevention. The NIOSH guidelines include the following:

- Use non-latex gloves for activities that are not likely to involve contact with infectious materials (food preparation, routine housekeeping, general maintenance).
- When latex gloves are necessary, use powder-free gloves with reduced protein content.
- When wearing latex gloves, use no oil-base hand creams or lotions.
- After removing latex gloves, wash hands with a mild soap and dry thoroughly.
- Frequently clean areas and equipment contaminated with latex dust.
- For those workers who have latex allergies, avoid contact with latex gloves and products as well as avoiding the powder from latex gloves.

Some guidelines *(30, 48)* suggest that workers in whom glove use causes mild irritation should use (1) cotton glove liners, (2) non-petroleum based moisturizing creams/lotions, and (3) topical barrier products. These products may reduce contact with latex as well as protecting the skin from harsh detergents and other irritants. In a study in which a protective foam was applied to hands after washing with plain or antibacterial surgical scrub, the bacterial counts of the entire hand were not significantly altered by the presence of the foam *(27)*. In addition, the protective product did not affect glove integrity and thus could be used under surgical gloves.

## CONCLUSIONS

The use of antiseptic products for hand cleansing can significantly reduce the bacteria on the hands and thus reduce the chance of cross-contamination. These products include soap/detergents, instant hand

sanitizers, and antiseptic lotions/creams. In addition, gloves may be used to prevent cross contamination. When used in antiseptic handwash products, only alcohol and iodophores can kill large numbers of microbes instantly, although several other active agents CHG, PCMX, and triclosan are available that act less rapidly but have a residual effect. Antiseptic soaps or detergents remove surface bacteria and may have a residual effect. Instant hand sanitizers kill bacteria but do not have a lasting effect. The use of protective and antiseptic lotion products after washing may produce a residual antibacterial effect, reduce skin shedding, and protect against the irritating effects of liquids and latex.

## ABOUT THE AUTHOR

Technical Writer and Consultant, Phone or Fax: 225.767.0818; E-mail: aktaylor@ix.netcom.com.

### REFERENCES

1. Anonymous. 1985. Lotion each day helps keep infection away. Am. J. Nursing 85:771.
2. Anonymous. 1995. SERVSAFE Serving safe food certification coursebook. The Educational Foundation of the National Restaurant Association, Washington, D.C.
3. Anonymous. 1998. Emergency Nurses Association position statement – latex allergy. J. Emerg. Nursing 24:29A–30A.
4. Bhargava, H. N., and P. A. Leonard. 1996. Triclosan: applications and safety. Am. J. Infection Control 24: 209–216.
5. Brady, L. M., M. Thomson, M. A. Palmer, and J. L. Harkness. 1990. Successful control of endemic MRSA in a cardiothoracic surgical unit. Med. J. Aust. 152:240–5.
6. CDC. 1997. Outbreak of Staphylococcal food poisoning associated with precooked ham – Florida 1997. MMWR Weekly 46 (50):1189–1191 (www.cdc.gov).
7. Cohen, D. E., et al. 1998. American Academy of Dermatology's position paper on latex allergy. J. Am. Acad. Dermatol. 39:98–106.
8. Cosmetics, Toiletries, and Fragrance Association (CTFA). 1995 Healthcare continuum model. Cosmetics, Toiletries, and Fragrance Association, submitted to FDA, June 1995 (www.ctfa.org).
9. Dankert, J., and I. K. Shutt. 1976. The antibacterial activity of chloroxylenol in combination with ethylenediamine tetraacetic acid. J. Hyg. (Camb.) 76:11–22.
10. Denton, G. W. 1991. Chlorhexidine, p. 274-289. *In* S. S. Block (ed.), Disinfection, sterilization, and preservation, 4th ed. Lea & Febiger, Philadelphia.
11. Dyer, D. L., K. B. Gerenraich, and P. S. Wadhams. 1998. Testing a new alcohol-free hand sanitizer to combat infection. AORN Journal 68:239–251.
12. Ehrenkrantz, N. J., and B. C. Alfonso. 1991. Failure of bland soap handwash to prevent hand transfer of patient bacteria to urethral catheters. Infect. Control Hosp. Epidemiol. 12:654–662.
13. FDA. 1983. Part 347–Skin protectant drug products for over-the-counter human use. Federal Register 48(32): 6832–6833 (dated February 15, 1983).
14. FDA. 1994. Part 333–Topical Antimicrobial Drug Products for Over-the Counter Human Use. In Tentative Final Monograph for Health-Care Antiseptic Drug Products. Federal Register 59: starting on p. 32699, dated June 17, 1994 (www.gpo.gov).
15. FDA. 1999. 1999 Food Code. Food and Drug Administration, Bethesda, MD (www.fda.gov).
16. Fendler, E. J., R. A. Williams, and D. A. Comes. 1995. Antimicrobial cleansing compositions. U. S. Patent 5,635,462. Oct. 30.
17. Fendler, E. J., M. J. Dolan, and R. A. Williams. 1998. Handwashing and gloving for food protection. Part I: Examination of the evidence. Dairy Food Environ. Sanit. 18:814–823.
18. Fendler, E. J., M. J. Dolan, R. A. Williams, and D. S. Paulson. 1998. Handwashing and gloving for food protection. Part II: Effectiveness. Dairy Food Environ. Sanit. 18:824–829.
19. Gritter, M. 1998. The latex threat. Am. J. Nursing 98:26–33.
20. Hall, G. S., C. A. Mackintosh, and P. N. Hoffman. 1986. The dispersal of bacteria and skin scales from the body after showering and after application of a skin lotion. J. Hyg. (Camb.) 97:289–298.
21. Harvey, S. C. 1990. Topical Drugs, chapter 38. *In* A. R. Gennaro (ed.), Remington's pharmaceutical sciences, 18th ed. Mack Publishing Co., Easton, PA.
22. Korniewicz, D. M., M. Kirwin, K. Cresci, and E. Larson. 1993. Leakage of latex and vinyl exam gloves in high and low risk clinical settings. Am. Ind. Hyg. Assoc. J. 54:22–26.
23. Korniewicz, D. M., B. E. Laughon, W. H. Cyr, C. D. Lyttle, and E. Larson. 1990. Leakage of virus through used vinyl and latex examination gloves. J. Clin. Micro. 28:787–788.
24. Larson, E. 1989. Handwashing: It's essential– even when you use gloves. Am. J. Nursing 89:934–939.
25. Larson. E. L. and H.E. Morton. 1991. Alcohols. *In* S. S. Block (ed.). Disinfection, sterilization, and preservation, 4th ed. Lea & Febiger, Philadelphia.
26. Larson, E. 1995. APIC guideline for handwashing and hand antisepsis in health care settings. Am. J. Infection Control 23:251–269.
27. Larson, E., J. K. Anderson, L. Baxendale, and L. Bobo. 1993. Effects of a protective foam on scrubbing and gloving. Am. J. Infect. Cont. 21: 297–301.
28. McMurry, L. M., M. Oethinger, and S. B. Levy. 1998. Triclosan targets lipid synthesis. Nature 394:531–532.
29. Miller, M. L., L. A. James-Davis, and L. E. Milanesi. 1994. A field study evaluating the effectiveness of different hand soaps and sanitizers. Dairy Food Environ. Sanit. 14:155–160.
30. Muller, B. A., V. M. Steelman, P. G. Hartley, and T. B. Casale. 1998. An approach to managing latex allergy in the health care worker. J. Environ. Health 61:8–16.
31. Newman, J. L., and J. C. Seitz. 1990. Intermittent use of an antimicrobial hand gel for reducing soap-induced irritation of health care personnel. Am. J. Infect. Control 18:194–200.
32. NIOSH. 1997. NIOSH alert: preventing allergic reactions to natural rubber latex in the workplace. NIOSH (National Institute of Occupational Health and Safety), Pub. no. 97-135 (www.cdc.gov/niosh/latexalt.html).
33. NIOSH. 1998. Latex allergy–a prevention guide. NIOSH (National Institute of Occupational Health and Safety), Pub. no. 98-113 (www.cdc.gov/niosh/98-113.html).
34. Paulson, D. 1994. Controversy over hand sanitizers continues. Food Protection Report 10:7–8.
35. Paulson, D. S. 1994. Comparative evaluation of five surgical hand scrub preparations. AORN J. 60: 246–256.

36. Paulson, D. S. 1994. A comparative evaluation of different hand cleansers. Dairy Food Environ. Sanit. 14: 524–528.
37. Pether, J. V. S., and R. J. Gilbert. 1971. The survival of salmonellas on finger-tips and transfer of the organisms to foods. J. Hygiene (Camb.) 69:673–681.
38. Restaino, L. and C. E. Wind. 1990. Antimicrobial effectiveness of hand washing for food establishments. Dairy Food Environ. Sanit. 10:136–141.
39. Rouhi, M. 1998. Germ killers: Could widely used biocide triclosan, found in common household products, pose a health risk? Chem. Eng. News 76:9.
40. Sheena, A. Z., and M. E. Stiles. 1982. Efficacy of germicidal hand wash agents in hygienic hand disinfection. J. Food Prot. 45:713–720.
41. Sheena, A. Z., and M. E. Stiles. 1983. Efficacy of germicidal hand wash agents against transient bacteria inoculated onto hands. J. Food Prot. 46:722–727.
42. Sheena, A. Z., and M. E. Stiles. 1983. Comparison of barrier creams and germicides for hand hygiene. J. Food Prot. 46:943–946.
43. Shoup, A. J. 1997. Guidelines for the management of latex allergies and safe use of latex in perioperative settings. AORN Journal 66:726–731.
44. Stiles, M. E., and A. Z. Sheena. 1987. Efficacy of germicidal hand wash agents in use in a meat processing plant. J. Food Prot. 50:289–295.
45. Tuffnell, D. J., et al. 1987. Methicillin-resistant *Staphylococcus aureus:* the role of antiseptic in control of an outbreak. J. Hospital Infect. 10:255–259.
46. Voss, A. and A. F. Widmer. 1997. No time for handwashing!? Handwashing versus alcoholic rub: Can we afford 100% compliance? Infect. Control Hosp. Epidemiol. 18:205–208.
47. Webster, J., J. L. Faoagali, and D. Cartwright. 1994. Elimination of methicillin resistant *Staphylococcus aureus* from a neonatal intensive care unit after hand washing with triclosan. J. Paediatr. Child Health. 30:59–64.
48. Wheeler, K. F. 1992. Barrier lotions, along with gloves, can help deter occupational dermatitis. Occ. Health Safety 61:60–61.

*Dairy, Food and Environmental Sanitation, Vol. 20, No. 2, Pages 120-126*


# Reduction of *Escherichia coli* O157:H7 on Apples Using Wash and Chemical Sanitizer Treatments

Jim R. Wright, Susan S. Sumner,* Cameron R. Hackney, Merle D. Pierson, and Bruce W. Zoecklein


## SUMMARY

Unpasteurized apple cider has been implicated in outbreaks involving *Escherichia coli* O157:H7. Apples used for cider production may become contaminated by contact with animal feces. The objective of this study was to determine if wash and sanitizer treatments can reduce or eliminate *E. coli* O157:H7 on apples. Apples were subjected to six wash or sanitizing treatments: 200 ppm hypochlorite, a commercial phosphoric acid fruit wash, 5% acetic acid, 5% acetic acid followed by 3% hydrogen peroxide, a commercial peroxyacetic acid sanitizer, and distilled water. Apples that had been inoculated with a five-strain mixture (~$2 \times 10^5$ CFU *E. coli* O157:H7 per $cm^2$) were immersed in treatments for two minutes. The water wash, which caused reductions of only 1.1 logs when cells were enumerated on Sorbitol MacConkey agar (SMAC) and 0.6 logs when Tryptone Soy agar with 1% pyruvic acid (TSAP) was used, and was the only treatment that did not differ significantly from the no-wash control. Hypochlorite caused reductions of 2.1 logs on both media but differed significantly from the most effective treatment, 5% acetic acid. Phosphoric acid resulted in a reduction of 2.9 logs when cells were enumerated on SMAC but only 2.3 logs when TSAP was the recovery medium, indicating that the treatment caused some sublethal injury. For the acetic acid/hydrogen peroxide treatment, reduction was 2.5 log with SMAC and 2.4 logs with TSAP. The 5% acetic acid and peroxyacetic acid solutions were the most effective, causing reductions of 3.1 logs and 2.6 logs respectively, without apparent sublethal injury.


## INTRODUCTION

*Escherichia coli* O157:H7 was first identified as a foodborne pathogen in 1982 and is now acknowledged as a significant cause of foodborne illness *(15)* ranging from self-limited, watery diarrhea to the more severe hemorrhagic colitis, hemolytic uremic syndrome (HUS), and thrombotic thrombocytopenic purpura (TTP) *(28)*.

One of the earliest HUS outbreaks associated with apple juice or cider occurred in Canada two years before the recognition of *E. coli* O157:H7 as a foodborne pathogen; however, the agent responsible was not identified, possibly because of the length of time between sampling and analysis *(33)*. Outbreaks of HUS in Massachusetts in 1991 *(4)* and Connecticut in 1996 *(10)* attributed to *E. coli* O157:H7 were associated with the consumption of contaminated apple cider. In a 1996 outbreak involving unpasteurized apple juice in the Pacific northwest, Odwalla brand apple juice and juice mixtures contaminated with *E. coli* O157:H7 were implicated and caused a nationwide recall of all products containing apple juice *(9)*.

Although the specific mechanism of contamination of apple

cider with *E. coli* O157:H7 is often unknown, several explanations have been offered. Because cattle and other ruminants are generally regarded as the primary reservoir for this organism *(6)*, contamination most likely originates directly or indirectly from fecal matter. Direct contamination may result from the use of fallen apples, fertilization of orchards with manure, or even grazing of farm animals in close proximity to orchards. Other possibilities include poor hygiene and unsanitary procedures of field and processing staff, inadequate cleaning of processing equipment, the use of decayed or damaged fruit, and failure to wash apples properly before processing *(4, 35)*.

Many believe that the use of a kill step such as pasteurization rather than prevention of contamination is the best means of eliminating *E. coli* O157:H7 from apple cider. Some of the larger juice processors have already begun using a pasteurization procedure *(2)*. However, pasteurization may be cost prohibitive for many smaller operations, because costs increase sharply as production capacity and number of days per year of processing decrease *(22)*. In addition, pasteurization may adversely affect sensory characteristics responsible for the appeal of fresh cider *(29)*.

Besides pasteurization or other process that sterilizes the final product, the preventive measure with the greatest impact on the microbiological safety of cider may prove to be the use of a wash and/or sanitizing treatment on apples before processing. Such a measure may be the easiest to implement and monitor and may result in only moderately increased cost of production. A typical wash procedure employs water or chlorinated water, may be used with or without a scrubber, and is designed for removal of field soil prior to processing *(14)*. In addition, a commercial fruit wash can be added to wash water to facilitate removal of field soil. There is little research on the effectiveness of such products for the removal of bacteria. One such product was evaluated during this study.

Sanitizing compounds such as a chlorine solution, used either alone or in conjunction with a wash step, may also be employed *(8)*. In fact, chlorine solutions at concentrations of 50-200 ppm are the most widely used treatments for fresh produce, with a typical contact time of 1 to 2 minutes *(16)*. Organic acids such as acetic acid have GRAS status and have been shown to have antimicrobial properties. Hydrogen peroxide is also known for its bactericidal effects and decomposes, rapidly leaving no residual toxicity *(12, 13)*. Peroxyacetic acid displays good antimicrobial activity against a wide variety of microorganisms *(12, 13)*.

The objective of this study was to evaluate the effectiveness of various wash and sanitizer treatments for eliminating *E. coli* O157:H7 from the surface of apples.

## MATERIALS AND METHODS

### Preparation of inoculum

Five acid resistant *E. coli* O157:H7 strains, 380-94; 933; C7927 (human isolate from cider outbreak); E0019; and E09, were obtained from the University of Nebraska, Lincoln culture collection. Stock cultures were maintained on Tryptone Soy agar (TSA) (Difco Laboratories, Detroit, MI) at 4°C and grown in Tryptone Soy broth (TSB) (Difco Laboratories) at 35°C. From preliminary research, it was determined that the level of inoculum obtained in TSB for the five individual cultures was relatively even ($8.0 \times 10^8 - 1.5 \times 10^9$ CFU/ml). Each culture was subjected to two successive transfers by loop inocula to 10 ml TSB. A third transfer of 1 ml was made into 100 ml TSB adjusted to pH 5 with 1 N HCl; this step allowed the cultures to become acid adapted, as reported by Leyer et al. *(23)*. Incubation of cultures was for 18-24 hours at 35°C. Equal volumes of cultures were then combined to create a five-strain mixture. A 30-ml aliquot from the mixed culture was added to 9 liters sterile distilled water at 25°C in a 7 gal polypropylene tank (Nalgene, Rochester, NY). Preliminary studies showed that this cell suspension routinely resulted in a level of approximately $1 \times 10^6$ *E. coli* O157:H7 per ml. This suspension served as the inoculum for the test apples.

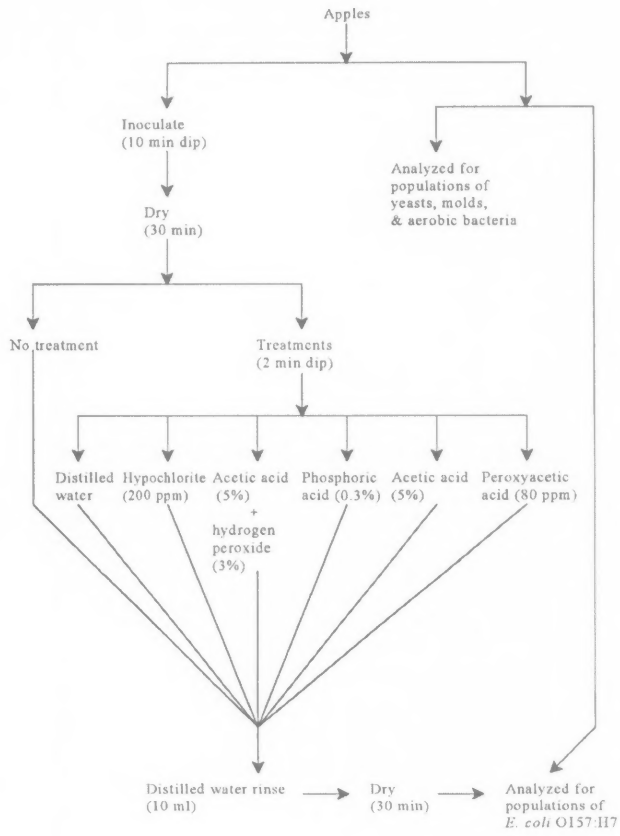
### Preparation and inoculation of apples

Sound, unwaxed, blemish-free Red Delicious apples of uniform size and shape (2 1/2 to 2 3/4 inches in diameter) were obtained from the Virginia Tech fruit and vegetable processing plant and assigned randomly to treatments. Apples were allowed to come to room temperature (~25°C) before being inoculated. A flow chart that illustrates inoculation procedures is given in Fig. 1. Apples were placed in the inoculum and agitated by stirring with a glass rod for 10 min to ensure even inoculation. For each replication, a portion of the apples were not inoculated and served as controls to check for natural flora. Inoculated apples were allowed to dry for at least 30 min in a laminar flow biological hood before treatment. Results of preliminary experiments indicated that this procedure provided uniformity and consistency in inoculation procedure and counts on the apples.

### Preparation of wash and sanitizer treatments

Five wash or sanitizer treatments were prepared: 200 ppm sodium hypochlorite; Decco APL Kleen® 246 (ELF Atochem North America, Inc., Monrovia, CA), a commercial phosphoric acid-based fruit wash (0.3% phosphoric acid); 5% acetic acid V/V (LabChem, Inc., Pittsburgh, PA); 5% acetic acid followed by 3% hydrogen peroxide (Fisher Scientific, Fairlawn, NJ); and Tsunami 100™ (Ecolab®, Food and Beverage Division, St. Paul, MN), a commercial peroxyacetic acid-based solution (80 ppm peroxyacetic acid). A distilled water treatment was also included as a control. Dis-

**Figure 1.** Scheme for evaluating the effectiveness of various chemical wash and sanitizer treatments for the removal of *E. coli* O157:H7 from apple surfaces.




tilled water for all treatments was allowed to reach room temperature (~25°C) before addition of chemicals and introduction of apples. Treatments were prepared in 2 gal polypropylene tanks (Nalgene) and stirred to mix before being applied.

### Application of wash and sanitizer treatments

Procedures in the application of treatments are outlined in Figure 1. Apples were placed in the treatment tanks and stirred with a glass rod to ensure even contact with the solution. Because a contact time of 2 minutes or less is generally employed with hypochlorite solutions used for produce *(16)*, a 2-min contact time was employed for each treatment for the sake of comparison. Contact time was determined by using a stopwatch. For the combination treatment, 5% acetic acid followed by 3% hydrogen peroxide, contact time was 1 min in each solution. For each apple, treatments were followed by a 10-ml distilled water rinse applied from a handheld sprayer (Fisher Scientific, Pittsburgh, PA). Apples were allowed to dry in a laminar flow biological hood for at least 30 min before analysis. For each replication, a portion of the inoculated apples received no treatment and served as a control to determine the actual inoculum level.

### Analysis and enumeration

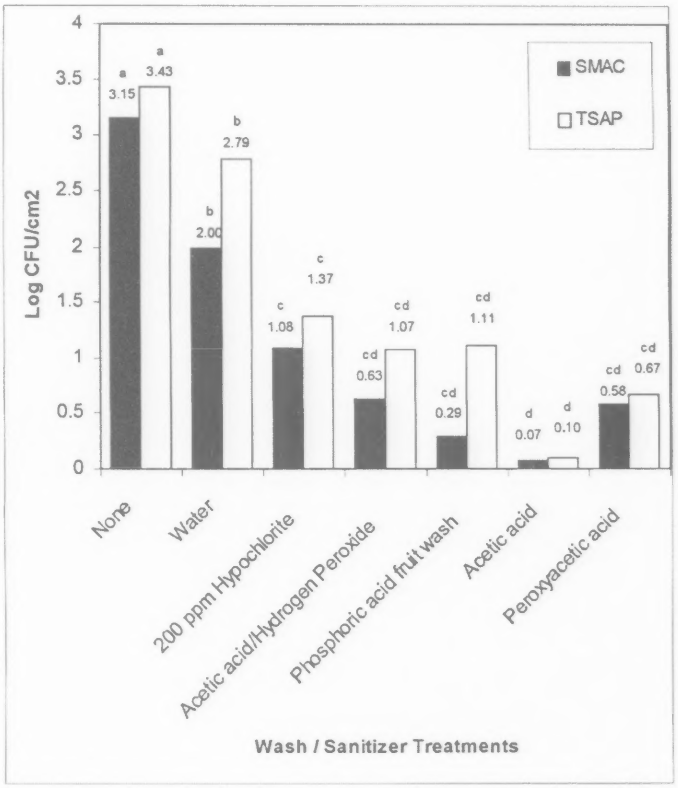
Following treatment, apples were placed individually in stomacher bags to which 100 ml of 0.1% sodium lauryl sulfate solution (SLS) (Fisher Scientific) was added. SLS was used to facilitate removal of any bacteria remaining on apple surfaces. Preliminary studies demonstrated that recovery was generally better with SLS solution than for 0.1% peptone solution. Each bag was massaged by hand for 1 minute.

Serial dilutions were made in 0.1% peptone (Difco Laboratories) and spread plated in duplicate on Sorbitol MacConkey agar (SMAC) (Difco Laboratories) and on TSA supplemented with 1% pyruvic acid (Fisher Scientific) (TSAP). Recovery of injured *E. coli* O157:H7 is best when nonselective media such as TSA *(32)* are used; thus the nonselective TSAP was used for the recovery of sublethally injured cells. Plates were incubated for 20 to 24 h at 35°C. Sorbitol negative colonies on SMAC and morphologically typical colonies on TSAP were enumerated with a Quebec colony counter. Routine verification of isolates was conducted using Micro-ID's (Remel, Lenexa, KS) and an *E. coli* O157 Latex agglutination test kit (Unipath Oxoid USA). Serial dulutions prepared from uninoculated apples were spread plated in duplicate on Yeast and Mold agar (Difco Laboratories) supplemented with 0.01% chloramphenicol (Fisher Scientific) (YMAC) for yeasts and molds; on TSA for aerobic mesophilic bacteria; and on SMAC. YMAC plates were incubated for 48 h at 25°C.

### Experimental design and statistical analysis

The experiment was replicated six times, and multiple samples from each of the 7 treatments plus the uninoculated control were analyzed at each sampling time. For each treatment, the total numbers of samples plated on SMAC and TSAP were 23 and 16, respectively. Microbial counts (CFU per square centimeter of apple surface area) were determined in duplicate for each replication. Because apples were uniform in size, a standard surface area measurement was used. Counts were subjected to the Kruskal-Wallis Test and Fisher's

**Figure 2.** Papulatians af *E. cali* O157:H7 an apples subjected ta wash ar sanitizer treatments as enumerated an Sarbital MacCankey agar (SMAC) and Tryptane say agar with 1% pyruvic acid (TSAP). Within each media type, values with different letters (a, b, c, d) differ significantly ($P \leq 0.001$ except far c-d, where $P \leq 0.022$).




Exact Test (2-Tail) using the Statistical Analysis System (SAS Institute, Cary, NC) to determine significant differences ($P \leq 0.001$ unless otherwise noted) among treatments.

## RESULTS

*E. coli* O157:H7 was not detected on apples that had not been inoculated, and the level of aerobic mesophilic background microflora on apples was <10 CFU/cm². Preliminary studies were conducted to determine the level of inoculum that could be obtained on the surface of apples. Although the level of inoculum obtained for the test apple suspension was routinely >$10^6$ CFU/ml, the inoculum level achieved for apple surfaces ranged from 4.6 to $8.0 \times 10^3$ CFU/cm². This was also the case for the control treatment that did not receive a wash or sanitizing step.

Mean *E. coli* O157:H7 counts on apple surfaces after treatments as recovered on SMAC are shown in Fig. 2. All treatments except water and 200 ppm hypochlorite resulted in a reduction of 2.5 logs or more. All treatments yielded reductions that differed significantly from results with the inoculated control that did not receive a wash. Likewise, water alone differed significantly from all other treatments. Reduction of *E. coli* O157:H7 on apple surfaces from water alone was 1.1 logs. No significant difference between chemical treatments was seen except for that between 5% acetic acid and 200 ppm hypochlorite ($P \leq 0.022$). The reduction achieved with 200 ppm hypochlorite, adjusted to pH 5 to maximize the amount of free available chlorine in solution, was 2.1 logs. Mean counts on SMAC for chemically treated apples ranged from 1.17 CFU/cm² for 5% acetic acid to 11.91 CFU/cm² for 200 ppm hypochlorite.

Results obtained using the injury recovery media TSAP, also shown in Fig. 2, were similar to those obtained with SMAC, although some differences were evident. When allowing for the recovery of sublethally injured organisms, only two of the chemical treatments (5% acetic acid and peroxyacetic acid) resulted in a reduction of 2.5 logs or greater. All treatments, including water, were significantly different from uninoculated controls, and all chemical treatments differed from water alone. As with SMAC, the only chemical treatments to differ significantly were 5% acetic acid and 200 ppm hypochlorite ($P \leq 0.018$). Mean counts on TSAP for chemically treated apples ranged from 1.25 CFU/cm² for 5% acetic acid to 23.28 CFU/cm² for 200 ppm hypochlorite.

## DISCUSSION

The reduction of approximately one log *E. coli* O157:H7 seen here when using the water dip treatment is consistent with reductions reported by other researchers. Brackett *(7)* reported a 1 log reduction of *Listeria monocytogenes* on Brussels sprouts dipped in water. Likewise, Harmon et al. *(20)* found that washing mung bean sprouts 3 times by spraying with water for 5 minutes reduced *Bacillus cereus* by approximately 1 log. Nguyen and Carlin *(27)* saw bacterial reductions of less than 1 log when using water as a wash for many different vegetables. Also, water alone had a little effect on the microbial load of packaged salad mix *(31)*.

Because water has no antimicrobial activity at the temperature at which it was used in this study, the reduction must have been due

to bacteria simply being washed off the surface of the apples. There may be a limit to the number of cells that can be removed in this way. A water wash used in conjunction with some physical means of removing bacterial cells, such as brushing may result in a greater reduction. In a survey of Virginia cider producers' practices, washing the fruit before crushing was reported by 98% of respondents, of whom indicated that they use brushing along with washing *(36)*. However, the results of the present study clearly show that a water dip treatment may be inadequate for removal of *E. coli* O157:H7 from apple surfaces, particularly if the fruit is heavily soiled. This finding appears even more important given that only 17% of those surveyed use any type of detergent wash, only 34% use a sanitizer, and the majority use water washing alone *(36)*.

Cider producers often use chlorinated water from a municipal water supply to wash apples. Chlorine is also widely added to wash water in fruit and vegetable processing plants as a sanitizer *(5)*. However, the antimicrobial activity of hypochlorite is reliant on environmental factors such as the pH, temperature, organic load, and ionic concentration of the solution *(12, 37)*. Goverd et al. *(19)* investigated the frequency of coliforms and *Salmonella* in cider and juice processing plants and saw an ongoing and cumulative bacterial contamination from fruit production to finished product. Coliform counts of flume water ranged from over $1.8 \times 10^3$ to $8.0 \times 10^6$. The microbial counts of fruits and vegetables, and thus the organic loads in fruit and vegetable wash and flume water, are often high *(27)*. In addition, wash solutions are often recycled, and this leads to a higher organic load and a greater chance of contamination of fruit *(8)*. Garg et al. *(17)* found that maintaining the desired level of free available chlorine in wash solutions in the processing plant was difficult and the difficulty was attributed to organic material in solution from vegetables and to the fact that chlorine addition was done manually.

For this study, a 200 ppm hypochlorite solution, adjusted to pH 5 to maximize available chlorine, was used. At a pH between 4 and 5, 98-100% of the chlorine is in the hypochlorous acid (HOCl) form, which is the form with greatest bactericidal activity *(12)*. Wash water was not recycled, the apples were not highly soiled, and levels of background microflora were low. Under such conditions, the effectiveness of chlorine is maximized, as has been shown by other researchers in laboratory studies *(1)*. In this study, the mean count of *E. coli* O157:H7 on apple surfaces after chlorine treatment, 11.91 CFU/cm$^2$ on SMAC and 23.28 CFU/cm$^2$ on TSAP, were the highest counts seen among the chemical treatments. Although these numbers may seem low, the infective dose of *E. coli* O157:H7 is believed to be very low *(25)*. This study was done under controlled conditions, and the effectiveness of hypochlorite in processing plants may be reduced, as mentioned. Several researchers have reported less-than-ideal results when using a hypochlorite solution as an antimicrobial wash treatment for various fruits and vegetables *(1, 7, 18, 34, 37, 38)*. Possible reasons given for the ineffectiveness of hypochlorite solutions in these studies are inactivation of hypochlorite by organic matter, incomplete wetting of produce *(7)*, and the inaccessibility of chlorine to crevices and pockets *(1)*.

The hypochlorite treatment was the only chemical treatment that differed significantly from any of the other chemical treatments. The difference was seen between hypochlorite and 5% acetic acid, which resulted in the lowest mean counts on both media. Only small differences were seen between the other chemical treatments, all of which were more effective than either water or hypochlorite solution in eliminating *E. coli* O157:H7 from apples.

The phosphoric acid-based fruit wash resulted in the second largest reduction (2.9 logs) when cells were plated on SMAC. However, it was better than only one other treatment, hypochlorite, when the injury recovery medium was used, resulting in a reduction of 2.3 logs. This suggests that the phosphoric acid may have caused sublethal injury to a portion of the bacterial cells. However, the difference between SMAC and TSAP was not statistically significant. It should be noted that this product is described by the manufacturer as a general purpose acidic cleaner and is not intended to be a sanitizer. It is designed for the removal of field soil from apples and pears.

Hydrogen peroxide used in chiller water for poultry at a concentration of 6600 ppm is an effective bactericide, but it leads to bleaching and bloating of carcasses *(24)*. Researchers investigating the effectiveness of several sanitizers in removal of *E. coli* O157:H7 from produce, saw a reduction of 2 logs on broccoli and 4 logs on tomatoes when 3% hydrogen peroxide was used. However, the most effective treatment, 5% acetic acid followed by 3% hydrogen peroxide, reduced the number of organisms to undetectable levels *(30)*. This treatment is also an effective means of reducing the bacterial load on beef carcass tissue *(3)*. We chose to include this treatment in our study based on the results of these earlier works. In this study, the combination treatment of acetic acid/hydrogen peroxide caused a reduction of 2.5 logs when cells were enumerated on SMAC and 2.4 logs on TSAP. This treatment was slightly less effective than acetic acid alone. Increasing the contact time in each solution may result in a greater reduction. However, as mentioned previously, these treatments did not differ significantly.

Little information exists on the use of peroxyacetic acid for removing pathogens from produce surfaces. It is increasingly used in clean-in-place sanitizing in beverage

and dairy plants because to its effectiveness against yeasts and molds *(26)*. It has also been used as a sanitizer for food contact surfaces and has been found to be effective for inactivating various pathogens, including *Listeria monocytogenes*, *Yersinia enterocolitica*, and *Campylobacter jejuni (12)*. In the present study, the peroxyacetic acid treatment, like acetic acid, tended to kill rather than injure the organism though reduction was slightly lower for peroxyacetic than for acetic acid.

Studies on the antimicrobial effectiveness of acetic acid have yielded mixed results. Zhang and Farber *(37)* saw *Listeria monocytogenes* reductions of less than one log on lettuce and cabbage treated by dipping in 1% acetic acid. More concentrated solutions of acetic acid were not tested, however, as higher concentrations might have adversely affected the quality of these leafy vegetables. Spray treatments with organic acids including acetic acid, in concentrations up to 5% were used with some success to reduce *E. coli* O157:H7 on beef tissue; however, total elimination was not achieved *(11)*. Karapinar and Aktug Gonul *(21)* achieved a 5 log reduction of *Yersinia enterocolitica* on parsley by dipping in either 2% or 5% acetic acid for 15 min. *E. coli* O157:H7 is reduced by 2 logs on broccoli and 3 logs on tomatoes, with little effect on quality, when acetic acid solutions of 2% and 5% are used *(30)*. In this study, 5% acetic acid was the most effective treatment for the elimination of *E. coli* O157:H7 from the surface of apples resulting in a reduction of 3.1 logs without causing sublethal injury.

Based on the results of this study, it appears that the use of a sanitizing treatment in conjunction with a water or commercially available detergent fruit wash for cider apples may help to reduce *E. coli* O157:H7 in apple cider. The purpose of the wash step is to remove field soil, and it should not be relied upon for removal of pathogenic microorganisms. Any of the chemical solutions used in this study, with the exception of hypochlorite, could be used as a sanitizing treatment following the wash step and should be more effective in reducing *E. coli* O157:H7 than practices currently used by the majority of producers. Both 5% acetic acid and 80 ppm peroxyacetic acid were effective in reducing *E. coli* O157:H7 from apple surfaces without causing sublethal injury. More research is needed, however, to determine the effectiveness of such treatments under actual processing conditions.

## ACKNOWLEDGMENTS

This research was supported by a grant from the Virginia Agricultural Council (Project #339) The authors thank Steven Kathman and Amy Lanning for assistance with statistical analysis.

## ABOUT THE AUTHORS

*Department of Food Science and Technology, Virginia Polytechnic Institute and State University, Blacksburg, VA 24061, Phone: 540.231.5280; Fax: 540.231.9293; E-mail: sumners@vt.edu.

### REFERENCES

1. Adams, M. R., A. D. Hartley, and L. J. Cox. 1989. Factors affecting the efficacy of washing procedures used in the production of prepared salads. Food Microbiol. 6:69–77.
2. Aylsworth, J. 1997. Cider producers keep eyes on FDA. American Fruit Grower. 117:30–31.
3. Bell, K. Y., C. N. Cutter, and S. S. Sumner. 1997. Reduction of foodborne microorganisms on beef carcass tissue using acetic acid, sodium bicarbonate, and hydrogen peroxide spray washes. Food Microbiol. 14:439–448.
4. Besser, R. E., S. M. Lett, J. T. Weber, M. P. Doyle, T. J. Barrett, J. G. Wells, and P. M. Griffin. 1993. An outbreak of diarrhea and hemolytic uremic syndrome from *Escherichia coli* O157:H7 in fresh-pressed apple cider. JAMA 269:2217–2220.
5. Beuchat, L. R., and J. Ryu. Produce handling and processing practices. Emerg. Infect. Dis., [serial on line] 1977 Oct.-Dec. 3. Available from: URL:http://www.cdc.gov/ncidod/EID/eid.htm.
6. Borczyk, A. A., H. Lior, and L. M. C. Duncan. 1987. Bovine reservoir for verotoxin-producing *Escherichia coli* O157:H7. Lancet 1:98.
7. Brackett, R. E. 1987. Antimicrobial effect of chlorine on *Listeria monocytogenes*. J. Food Prot. 50:999–1003.
8. Brackett, R. E. 1992. Shelf stability and safety of fresh produce as influenced by sanitation and disinfection. J. Food Prot. 55:808–814.
9. CDC. 1996. Outbreak of *Escherichia coli* O157:H7 infections associated with drinking unpasteurized commercial apple juice – British Columbia, California, Colorado, and Washington, October, 1996. MMWR 45:975.
10. CDC. 1997. Outbreaks of *Escherichia coli* O157:H7 infection and cryptosporidiosis associated with drinking unpasteurized apple cider – Connecticut and New York, October, 1996. MMWR 46:4–8.
11. Cutter, C. N., and G. R. Siragusa. 1994. Efficacy of organic acids against *Escherichia coli* O157:H7 attached to beef carcass tissue using a pilot scale model carcass washer. J. Food Prot. 57:97–103.
12. Davidson, P. M., and A. L. Branen (ed.). 1993. Antimicrobials in foods. Marcel Dekker, Inc., New York.
13. Dillon, V. M., and P. E. Cook. 1994. Biocontrol of undesirable microorganisms in food, p. 255-296. *In* V. M. Dillon and R. G. Board (ed.), Natural antimicrobial systems and food preservation. CAB International, Wallingford, UK.
14. Downing, D. L. 1989. Apple cider, p. 169-187. *In* D. L. Downing (ed.), Processed Apple Products. Van Nostrand Reinhold, New York.
15. Doyle, M. P. 1991. *Escherichia coli* O157:H7 and its significance in foods. Int. J. Food Microbiol. 12:289–302.
16. Food and Drug Administration. 1998. Guidance for Industry: Guide to Minimize Microbial Food Safety Hazards for Fresh Fruits and Vegetables. Food and Drug Administration. Washington, DC.
17. Garg, N., J. J. Churey, and D. F. Splittstoesser. 1990. Effect of processing conditions on the microflora of fresh-cut vegetables. J. Food Prot. 53:701–703.
18. Golden, D. A., E. K. Heaton, and L. R. Beuchat. 1987. Effect of chemical treatments on microbiological, sensory, and physical qualities of individually shrink-wrapped produce. J. Food Prot. 50:673–680.

19. Goverd, K. A., F. W. Beech, R. P. Hobbs, and R. Shannon. 1979. The occurrence and survival of coliforms and salmonellas in apple juice and cider. J. Appl. Bacteriol. 46:521–530.
20. Harmon, S. M., D. A. Kautter, and H. M. Solomon. 1987. *Bacillus cereus* contamination of seeds and vegetable sprouts grown in a home sprouting kit. J. Food Prot. 50:62–65.
21. Karapinar, M., And S. Aktug Gonul. 1992. Removal of *Yersinia enterocolitica* from fresh parsley by washing with acetic acid or vinegar. Int. J. Food Microbiol. 16:261–264.
22. Kozempel, M., A. McAloon, and W. Yee. 1998. The cost of pasteurizing apple cider. Food Technol. 52:50–52.
23. Leyer, G. J., L. Wang, and E. A. Johnson. 1995. Acid adaptation of *Escherichia coli* O157:H7 increases survival in acidic foods. Appl. Environ. Microbiol. 61:3752–3755.
24. Lillard, H. S., and J. E. Thomson. 1983. Efficacy of hydrogen peroxide as a bactericide in poultry chiller water. J. Food Sci. 48:125–126.
25. Lior, H. 1994. *Escherichia coli* O157: H7 and verotoxigenic *Escherichia coli* (VTEC). Dairy Food Environ. Sanit. 14:378–382.
26. Marriott, N. G. 1994. Principles of food sanitation. Chapman & Hall, Inc., London.
27. Nguyen, C., and F. Carlin. 1994. The microbiology of minimally processed fresh fruits and vegetables. Crit. Rev. Food Sci. Nutr. 34:371–401.
28. Padhye, N. V., and M. P. Doyle. 1992. *Escherichia coli* O157:H7: Epidemiology, pathogenesis, and methods for detection in food. J. Food Prot. 55:555–565.
29. Parish, M. E. 1997. Public health and nonpasteurized fruit juices. Crit. Rev. Microbiol. 23:109–119.
30. Peters, D. L. 1995. Control of enteric pathogenic bacteria on fresh produce. M.S. thesis. University of Nebraska.
31. Shapiro, J. E., and I. A. Holder. 1960. Effect of antibiotic and chemical dips on the microflora of packaged salad mix. Appl. Microbiol. 8:341–344.
32. Silk, T. M., and C. W. Donnelly. 1997. Increased detection of acid-injured *Escherichia coli* O157:H7 in autoclaved apple cider by using nonselective repair on trypticase soy agar. J. Food Prot. 60:1483–1486.
33. Steele, B. T., N. Murphy, G. S. Arbus, and C. P. Rance. 1982. An outbreak of hemolytic uremic syndrome associated with ingestion of fresh apple juice. J. Pediatr. 101:963–965.
34. Wei, C. I., T. S. Huang, J. M. Kim, W. F. Lin, M. L. Tamplin, and J. A. Bartz. 1995. Growth and survival of *Salmonella montevideo* on tomatoes and disinfection with chlorinated water. J. Food Prot. 58:829–836.
35. Wojtala, G. 1997. Unpublished letter. Food Division, Michigan Dept. of Agriculture, Lansing, MI.
36. Wright, J. R., S. S., Sumner, C. R. Hackney, M. D. Pierson, and B. W. Zoecklein. 1999. A survey of Virginia cider producers practices. Dairy Food Environ. Sanit. (submitted).
37. Zhang, S., and J. M. Farber. 1996. The effects of various disinfectants against *Listeria monocytogenes* on fresh-cut vegetables. Food Microbiol. 13:311–321.
38. Zhuang, R. Y., L. R. Beuchat, and F. J. Angulo. 1995. Fate of *Salmonella montevideo* on and in raw tomatoes as affected by temperature and treatment with chlorine. Appl. Environ. Microbiol. 61:2127–2131.

# Reflections from the Past

## The Association's New Name: A Historical Perspective

Elmer H. Marth

The Members have spoken and our Association has a new name! This action resulted after nearly 20 years of efforts to reach that goal. It cannot be said that IAMFES acted in haste on this issue. Much of what happened during the past 20 years regarding a change in the Association's name was never written into the official records and resides in the memories of persons involved with this matter. Consequently, before memories become too dim with time, I thought it appropriate to describe some of the work that went into this project.

### EARLY EFFORTS

The seeds for the Association's new name were sown at the 1976 Annual Meeting of the Journal Management Committee. Dr. Kenneth G. Weckel, then a professor of food science at the University of Wisconsin-Madison and a past president of IAMFES, was a member of the committee and had been for several years. Dr. Weckel felt that the title, *Journal of Milk and Food Technology,* was inappropriate because it did not reflect the journal's content nor the primary purpose of IAMFES. He had expressed this view at several earlier meetings of the committee, and also offered suggestions of titles that might be adopted. The committee agreed with Weckel's views, but his suggested titles were unacceptable to the committee and to me as editor.

In 1976, Dr. Weckel again brought up the matter of the journal title but this time offered no suggestions of alternative titles. Instead, the matter was discussed by the entire committee and the title, *Journal of Food Protection,* emerged from the discussion. This title was acceptable to the entire committee, including the editor. Dr. Ralston B. "Pete" Read, then director of the microbiology division of the Food and Drug Administration, was chairman of the committee and in his report to the Executive Board of IAMFES, on behalf of the committee, recommended that the new title be adopted for the journal. The Executive Board accepted the recommendation and the first issue of the *Journal of Food Protection* appeared in January of 1977.

By 1980 it was evident to me (and to others) that the change in title had a salutary effect on the journal. The number of manuscripts submitted for publication

had increased and the overall quality of work reported in these papers had improved. As I was preparing for the 1980 annual meeting of the Journal Management Committee, it occurred to me that a similar change in the name of the Association would be beneficial both for the Association and for the journal. Thus I suggested to the committee that the name of IAMFES be changed to International Association for Food Protection. The committee agreed with my reasoning and so Chairman Read, on behalf of the committee, recommended to the Executive Board of IAMFES that the Association's name be changed as just mentioned. The Executive Board did not accept the recommendation. The process was repeated in 1981 with the same result, the recommendation was not accepted by the Executive Board.

In 1982, the Journal Management Committee agreed it would be futile to further pursue the matter. It was then that I decided to offer a motion at the annual business meeting that the name of the Association be changed to International Association for Food Protection. My motion was seconded and then was soundly defeated. At this point I concluded it served no purpose to continue working on this issue.

Later in 1982, Dr. Robert Marshall, then president of IAMFES, arranged for a survey form to be sent to the Members. Members were offered three choices regarding the name of the Association: no change, International Association for Food Protection, or International Association for Milk and Food Protection. There were 876 forms returned with 92 (10.5%) choosing no change, 517 (59%) choosing International Association for Food Protection and 265 (30.3%) selecting International Association for Milk and Food Protection (see report by then president Robert T. Marshall, *Journal of Food Protection* 45:1273, 1982). Even though nearly 90% of votes indicated the name of the Association should be changed and nearly 60% chose International Association for Food Protection, the Executive Board at its 1983 annual meeting listened to the views of some vocal dairy sanitarians, ignored the wishes of most Members, and chose to maintain the status quo.

However, the matter did not go away. In 1984 at the annual business meeting, Dr. R. B. Read made a motion to require the Executive Board to take immediate action to change the name of the Association to Association for Food Protection. The motion was seconded and then was promptly tabled by a vote of 46 to 25. This meant the motion had to be considered again at the 1985 annual business meeting when it, too, was soundly defeated. With this action the issue went into hibernation for the remainder of the 1980s.

## RECENT EFFORTS

The question of a name change was considered by the Executive Board early in the 1990s. The Board agreed that the name should be changed to International Association for Food Protection. A motion to that effect was brought before the business meeting in 1993 when Dr. Michael Doyle was president of IAMFES. The motion was defeated.

In April of 1997, the Executive Board revisited the issue of the Association's name, the issue also was discussed at meetings of committees at the IAMFES Annual Meeting in Orlando, Florida. These discussions generally were favorable and prompted the Executive Board at its October 1997 meeting to agree that the name of the Association should be changed to International Association for Food Protection. In February, 1998 Mr. Gale Prince discussed the name change in his president's column in *Dairy, Food and Environmental Sanitation*. A few months later, personnel in the IAMFES office researched the legal aspects of a change in the Association's name. The proposed new name was promoted in July, 1998 at the IAMFES Annual Meeting in Nashville and soon after a task force began to rewrite the constitution and bylaws to incorporate the new name.

During the fall of 1998 and the spring of 1999 Dr. Robert Brackett and Mr. David Tharp discussed the proposed new name in the president's and executive director's columns, respectively, in *Dairy, Food and Environmental Sanitation*. Revision of the constitution and bylaws was completed and a copy was sent to members in June, 1999.

The revised constitution and bylaws, with the name change in place, were adopted almost unanimously by over 300 Members who attended the annual business meeting on August 3, 1999 in Dearborn, Michigan. This was followed by the mailing of ballots to the entire Membership so everyone could vote on the issue. Ballots had to be returned to the IAMFES office by September 30, 1999; results of the vote were posted on the IAMFES Web site on October 10, 1999 and published in the November, 1999 issue of *Dairy, Food and Environmental Sanitation*. During the fall of 1999 legal matters regarding the name change were completed and on January 1, 2000 IAMFES became the International Association for Food Protection.

## WHY NOW?

Why did the Membership vote overwhelmingly to change the name of the Association when earlier efforts to do so were soundly defeated? It appears that the confluence of several factors made it possible.

First, the Executive Board recognized the need to change the name and members of the Board, even with the annual changes in Membership, were unanimous in their decision that it should be International Association for Food Protection. This vision and unanimity enabled the Board to exert the leadership needed to inform and convince the Members that this move was important for the welfare of the Association. Such leadership by the Executive Board was lacking in the 1980s.

Second, the *Journal of Food Protection* has grown continuously since 1977 and now is the major source of published information, worldwide, on issues related to food protection. Likewise, the programs of IAMFES Annual Meetings in the last decade have grown to become the leading source of current information on food protection. Thus, Members felt it was reasonable for food protection to be in the Association's name.

Third, newer Members in the Association had no emotional ties to the old name and hence were ready to vote for a name that represents current and future activities of the Association.

Fourth, the Membership of IAMFES changed markedly during the last two decades. It once was primarily dairy-oriented, whereas now it is largely food-oriented. This change ultimately overcame the desire of some to retain "milk" (even though it too is a food) in the name of the Association.

There may still be other reasons for the near-unanimous vote by the members (94% favored the change) on this issue. It is unfortunate that Dr. R. B. Read did not live to see this change in the name of the Association. He would have been pleased.

## ACKNOWLEDGMENTS

This article was reviewed by Drs. Robert E. Brackett, Michael P. Doyle, and Robert T. Marshall; by Emeritus Professor Earl O. Wright; and by International Association for Food Protection Executive Director, Mr. David Tharp. I thank all for their help to make this article as accurate as possible.

## ABOUT THE AUTHOR

Emeritus professor of food science, bacteriology, and food microbiology and toxicology, University of Wisconsin-Madison; editor, *Journal of Milk and Food Technology* (1967-1976) and *Journal of Food Protection* (1977-1987), Department of Food Science, University of Wisconsin-Madison, 1605 Linden Drive, Madison, WI 53706-1565.

# Presidential Address

Earl O. Wright

1974 Annual Meeting
International Association of Milk, Food and Environmental Sanitarians
St. Petersburg, Florida

August 11-14, 1974

This year will be recorded as one of big change for IAMFES. The office of the Executive-Secretary was relocated on January 1, 1974. At that time the headquarters and office functions were moved from Shelbyville, Indiana to Ames, Iowa. This will certainly also be a year that I will long remember. It has been gratifying that the Membership has been very patient and helpful through the transition. Publication of the Journal will be moved to Ames where a new printer will do the work after January 1, 1975. We hope you will again have patience with us when we make this move. The wearing of two hats since last January has been an intriguing experience for me. I am referring to serving as both President of the organization and taking on my new duties as Executive Secretary.

## Affiliates and Membership

This year, considerable effort has been directed toward strengthening the affiliate organizations and reviving affiliates that had not been active in recent years. Affiliate organizations are the local arm of IAMFES, and it is very essential that this representation be a strong one if our Association is to continue its outstanding work. There are several states or areas that do not have organized affiliates even though they do have a large number of direct members. There is a challenge for us to help organizations function in these areas. To accomplish this it will take the effort of many active affiliates. I know that the affiliates will respond when called upon to help in this effort.

It has been very gratifying to know that the Association has had 350 to 400 new direct or affiliate members join this year. This is largely due to the fine efforts of our Committee on Membership that is led by Harold Heiskell. Increasing Membership should be a goal for everyone to work on. The strength of an organization is in its Membership. I wonder how many prospective members each of you have talked to this year? A good, active, membership is the first ingredient to a successful organization. The activity of that membership is the second important ingredient. Put these two together with proper leadership and a successful organization will emerge. With the successful organization that we enjoy in IAMFES, it is necessary to constantly keep reviewing these two ingredients if we are to continue to be one of the leading organizations in this field.

There is a good possibility that we will have new affiliates organized in two of our neighboring countries in the near future. With the number of our subscribers growing abroad this could well be our golden opportunity to begin to establish affiliate activity in other countries. Your Executive Board is taking a serious look at such possible developments. One new affiliate organization has become a reality at this meeting. We now have two affiliate associations with our neighbor, Canada.

## Cooperation with NEHA

The Association has continued its investigation of a possible future merger with the National Environmental Health Association (NEHA). This year the Executive Secretaries of the two organizations made a study of the organizations – comparing their composition, functions, and financial status. This report is now in the hand of the two Executive Boards who will be giving it further consideration. It is not an easy

matter to combine two strong organizations into an amalgamated organization. It first must be determined if this type of procedure would benefit the Membership. If this is a possibility then what type of an organization should be the outcome? Joining two strong organizations together is no assurance that the new or reorganized group will be successful. I have seen both successes and failures in the past decade among dairy and food plants attempting to combine into another organization. Because of the similarities of our Memberships, before steps toward merger can be taken a thorough investigation should be made with both organizations participating.

## Committees

Committee work is the backbone of our organization. Much effort has been put forth to strengthen committees. We have 28 committees functioning within our organization. Keeping up-to-date with each of these committees is no easy task. The success of this organization is very dependent on hard working committees. IAMFES is very fortunate in having not only hard working Membership but also top notch leadership which makes things happen and gets things done. We are asking our affiliate associations to annually make suggestions and recommendations to the President-Elect who is in charge of committee assignments, so that new leadership becomes involved in committee work. I want to thank the chairman of each committee for the help he has given me this past year. If our organization is to serve our Membership properly, the committees must be in tune with the needs of the Membership. The affiliate organizations can play a major role in this area.

## The Journal

*The Journal of Milk and Food Technology* is our mouthpiece. It serves as a strong public relations medium for our organization. Subscriptions for this Journal from foreign countries are growing; we are now mailing the Journal to most foreign countries. This Journal is recognized as being outstanding in the area of milk and food safety and sanitation. Because of the reputation of the Journal and our strong organization we have clientele covering a wide spectrum of interests. Our clientele vary from the research scientist in the laboratory doing research on quality and other problems, to students, and to sanitarians who are doing quality control work in the field. The food industry has become an important section of our clientele. We need to increase and promote the interest of this group in our Journal and organization. With this wide range of clientele it is evident that our Journal can not be all things to all people. Our Journal enjoys the recognition of researchers and the academic community. Therefore, we have the good fortune of receiving outstanding research articles for publication. In addition to research papers the Journal endeavors to have an equal amount of space devoted to technical papers (sometimes in form of review articles), non-technical papers, and affiliate news published in each issue, in that order, if all theses materials are available. The most difficult papers to obtain for publication are those of a non-technical nature. We ask your help in strengthening this area of the Journal.

The Journal is nearly a self-supporting vehicle. Printing of the Journal will be moved to Ames, Iowa on January 1, 1975 so that this operation is located in close proximity to the main office.

## In Conclusion

IAMFES is an active and strong organization because of the input from its individual Members. IAMFES will continue to represent the Members as their professional organization in a manner that is desired by the Members. It is up to you as Members to communicate with leaders of your organization to let your wishes be known. This can be done by working through your affiliate and also by directly contacting the Executive Secretary's office. This office is waiting for suggestions about needed improvements. Many have already been made and changes are being planned because of your suggestions. More communication always results in better understanding.

Reprinted from *The Journal of Milk and Food Technology*, Vol. 37, No. 11.

# International Association for Food Protection

# 2000 – 2001

# SECRETARY ELECTION

Biographical information on the Secretary candidates for 2000-2001 is presented on the following page. Please review the information carefully as you make your decision on which candidate to vote for.

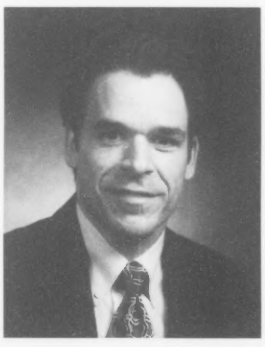
Ballots will be mailed to all International Association for Food Protection Members during the first week of February. Completed ballots are due back to the Association office by March 24, 2000. Sealed ballots will be forwarded to the Tellers Committee for opening and counting. Results of the election will be announced in the May issue of *Dairy, Food and Environmental Sanitation.*

If you have any questions about the voting process, please contact David W. Tharp, Executive Director at 800.369.6337, or 515.276.3344, or E-mail: dtharp@foodprotection.org.

# THE CANDIDATES

## PAUL A. HALL

## FRANK YIANNIS



# BIOGRAPHICAL INFORMATION

## Paul A. Hall

Paul A. Hall is Director of Microbiology and Food Safety for Kraft Foods where he is responsible for developing and directing strategic microbiological safety and research programs including microbiological risk management, control of pathogens and spoilage organisms, HACCP implementation and regulatory compliance. Prior to joining Kraft in 1989, Mr. Hall previously held corporate microbiology positions for Anheuser Busch Companies and Ralston Purina Company.

During his 25-year career, Mr. Hall has published and lectured extensively in the area of microbiological food safety and has served on a number of microbiological trade and professional association technical committees. He is an active member and past-chair of the International Life Sciences Institute's (ILSI) Technical Committee on Food Microbiology and was instrumental in forging the highly successful Annual Meeting collaboration between IAFP and ILSI. Mr. Hall has been an active Member of IAFP since 1987. He is currently vice-chair of the Annual Meeting Program Committee and is also a member of the *Journal of Food Protection* Management Committee, past editorial board member of the *Journal of Food Protection* and past Black Pearl Award Jury Committee member. Mr. Hall has organized and chaired numerous Annual Meeting symposia and programs over the past twelve years.

Other professional affiliations for Mr. Hall include, Chair – Industry Board of Advisors for the University of Georgia, Center for Food Safety and Quality Enhancement, National Center for Food Safety and Technology, Past President – Food Microbiology Division – American Society for Microbiology, and Executive Committee – Food Microbiology Research Conference. Additionally, Mr. Hall has served on the Food and Drug Administration's CFSAN Research Review Committee and as an industry representative on the Food Laboratory Accreditation Working Group. Mr. Hall received his bachelor's degree in microbiology from the University of Missouri – St. Louis and his M.S. in management of technology from Washington University in St. Louis. He is currently completing a Ph.D. in quality management.

## Frank Yiannas

Frank Yiannas is Manager of Walt Disney World's Environmental Health Department. He oversees all food safety programs, as well as other public health functions, for one of the world's largest entertainment companies. Mr. Yiannas joined Disney in 1989 to establish their first food safety laboratory. During his tenure, Mr. Yiannas has expanded the program beyond testing by establishing cutting-edge risk management strategies.

Mr. Yiannas is a nationally recognized speaker on the topic of innovative and creative approaches to food safety. Under his direction, Disney has been recognized for playing a leadership role in implementing HACCP at the food service level, developing hand-held computer technology to conduct food safety audits, and utilizing progressive microbial detection methods. Mr. Yiannas plans to extend the hand-held technology to computerize HACCP measurements. Also, he presently co-chairs a committee to develop international food safety icons that visually and universally communicate important food safety processes.

Mr. Yiannas has been an active Member of IAFP since 1993. His involvement at the Annual Meetings includes organizing symposia, functioning as convenor, and presenting on relevant food safety issues. Mr. Yiannas is presently serving a three-year term on the Annual Meeting Program Committee. He also chairs the Food Sanitation Professional Development Group (PDG), and is a member of the Microbial Risk Assessment and Retail Food Safety & Quality PDGs.

Locally, Mr. Yiannas is very involved with the Florida Association of Milk, Food and Environmental Sanitarians (FAMFES). He is the current president of FAMFES and plays an active role in organizing the annual education conferences, assisting with the FAMFES newsletter, and recruiting new members.

At the national level, Mr. Yiannas holds a seat on Council I, Laws and Regulations, of the Conference for Food Protection (CFP). This council recommends changes to the Food and Drug Administration Model Food Code. He recently co-chaired a committee for the CFP to develop standards for permanent, outdoor cooking sites.

Mr. Yiannas is a Registered Microbiologist with the American Academy of Microbiology in the area of Consumer Products and Quality Assurance. He received his BS in microbiology with honors from the University of Central Florida and is pursuing a master of public health from the University of South Florida. In addition, he is a member of several professional associations, including the Institute of Food Technologists and the American Society for Microbiology.

# New Members

## AUSTRALIA

**Patricia Desmarchelier**
Food Science Australia
Brisbane, Queensland

## CANADA

**Brian R. Smith**
Maple Leaf Meats Inc.
Mississauga, Ontario

## GREECE

**Stamatia Kotretsou**
Technological Institute
Athens, Attiki

## ITALY

**Leslie G. Huck**
U.S. Army Veterinary Corps.
Vicenza

## MEXICO

**Lopez Guisa Gabriel**
Siasport, S.A. DE C.V.
Jacona, Michoacan

## UNITED STATES

### Arkansas

**Mike Doyle**
OK Foods, Fort Smith

### California

**Toni L. Hofer**
Raley's, W. Sacramento

**Mary S. Palumbo**
California Dept. Health Services
Sacramento

### Connecticut

**Bob Sulick**
Carl's Pasta Inc., Manchester

### Illinois

**Ray Burke**
Haarmann & Reimer, Kildeer

**Winston Lees**
The Chicago Group Inc., Chicago

**Maria P. Oria**
Institute of Food Technologists
Chicago

### Indiana

**Dave McClure**
The Steritech Group, Indianapolis

### Iowa

**Edward E. Fetzer**
Iowa State University, Ames

### Kansas

**Tom Nielsen**
National Beef Packaging Co.
Liberal

### Maryland

**Margaret E. Cole**
CFSAN, Laurel

### Missouri

**Kristin L. Kollath**
Whitmire Micro-Gen, St. Louis

**Eric Murphy**
Archimica (Missouri) Inc.
Springfield

### Nevada

**Theodore Mori**
The Sausage Factory, Carson City

### New Jersey

**Yi-Cheng Su**
Papetti's Hygrade Egg Products
Elizabeth

### New York

**Joseph Corby**
NYS Dept. Ag. & Mkts., Albany

**Martin Wiedmann**
Cornell University, Ithaca

### North Carolina

**Marlin Bembers**
Carolina Turkeys, Mount Olive

### Ohio

**Terry A. Kroening**
Borden Foods Corp., Gahanna

### Pennsylvania

**Donna Boozer**
Capsugel, Greenwood

**Nkuchia Mikanatha**
Pennsylvania Dept. of Health
Harrisburg

**Brendan A. Niemira**
USDA-ARS, Wyndmoor

**John S. Novak**
USDA-ARS-ERRC, Wyndmoor

### Texas

**Tim Henderson**
City of Carrollton, Carrollton

### Wisconsin

**Todd C. Charnetzki**
Bou-Matic Equipment, Madison

## New IAFP Sustaining Member

**Stuart J. Ray**
Seward Limited
London, United Kingdom

## Alfa Laval Flow Inc. Appoints Marketing Supervisor

Marty Organ of Milwaukee, WI, has been promoted to marketing supervisor for Alfa Laval Flow Inc.

Organ joined Alfa Laval Flow Inc. in 1997 as marketing coordinator. He became senior marketing communication specialist before taking on his new role as marketing supervisor. In addition to his marketing communications activities, his new responsibilities will include overseeing the day-to-day activities in the marketing department.

## Society for Industrial Microbiology Elects Officers

New officers and directors have been elected by the Society for Industrial Microbiology (SIM). Vincent Gullo, Ph.D., director of microbial products, Schering-Plough Research Institute (Kenilworth, NJ) will serve as SIM president for the 1999-2000 term. President-elect for the term commencing in August 2000, is Kristien Mortelmans, Ph.D., senior microbiologist, biopharmaceutical development division, SRI International (Menlo Park, CA). LaVerne Boeck, Eli Lilly & Company, retired (Indianapolis, IN) is past president.

Steve Nelson begins his three-year term as treasurer which ends August 2002. Mr. Nelson is manager, Traders Protein (Memphis, IN). Ann Horan, associate director, microbial products, Schering-Plough Research Institute (Kenilworth, NJ) will continue to serve as secretary through her three-year term ending in August 2000.

Richard Baltz, Ph.D. was elected to SIM's Board of Directors. Dr. Baltz is president of CognoGen Biotechnology Consulting (Indianapolis, IN). Other SIM directors currently serving three-year terms are Anne Dombrowski, Ph.D. senior research fellow in natural products drug discovery at Merck Research Laboratories (Rahway, NJ); Brendlyn Faison, Ph.D., associate professor of biological sciences, Hampton University (Hampton, VA); and Douglas Jaeger, manager of custom fermentation for Abbott Laboratories (N. Chicago, IL).

## Dycus Joins Bell Laboratories as Technical Sales Rep for Western United States

Roman Dycus has joined Bell Laboratories' sales and marketing team as a technical sales representative for the western United States.

Dycus provides technical support and information on Bell's rodent control products to Bell distributors and PCOs in northern California, Oregon, Washington, Idaho, Montana, Wyoming, Utah, Nevada and Hawaii.

A trained entomologist, Dycus received a bachelor of science degree in entomology from the University of Kentucky, Lexington, KY, in 1995. He also holds a pest control license in fumigation, general pest control and termite control from the Hawaii Dept. of Agriculture.

Before joining Bell, Dycus worked for Terminix International, most recently as a regional service manager where he provided technical expertise and managed sales and service for its Hawaii region. Before that, he worked as a termite entomologist for the New Orleans Mosquito Control Board where he conducted practical field research with pesticide companies on controlling termites.

## AACC Appoints Editor-in-Chief of Cereal Chemistry

Dr. Jon Faubion, director of scientific services, American Association of Cereal Chemists, St. Paul, MN is the new editor-in-chief for the association's premier scientific journal *Cereal Chemistry*. Primary responsibilities include solicitation of cereal research results internationally, as well as supervising the Board of Editors and the scientific review process.

According to Steve Nelson, executive vice president, "The AACC Board of Directors selected Dr. Faubion because of his experience in cereal science research and publishing. In addition, the Board of Directors decided to take advantage of having the editor-in-chief position located at AACC headquarters as *Cereal Chemistry* makes the transition to an electronic journal."

Faubion succeeds Dr. Vladimir Rasper, Guelph, Ontario, Canada, who was editor-in-chief for six successful years.

## New Data Establish Link Between 'Mad Cow Disease' and Fatal Brain Damage in Humans

A new study now provides the most compelling evidence to date that infectious proteins called prions from cattle with bovine spongiform encephalopathy, commonly known as mad cow disease, have infected humans and caused fatal brain damage. Recent epidemiological findings, along with studies of the prion protein and transmissions to inbred mice and primates, have raised the possibility of a link between mad cow disease and a new form of Creutzfeldt-Jakob disease in humans, both characterized by an ultimately fatal perforation of tissue in the brain. In the article beginning on Page 15137 of the Dec. 21, 1999 PNAS, researchers from the University of California, San Francisco, and Western General Hospital in Edinburgh, Scotland, present the first compelling data to indicate that the particular strain of prion implicated in mad cow disease is the same strain that causes the variant of Creutzfeldt-Jakob disease. By creating a genetically altered line of mice carrying prion protein genes from cows, the researchers successfully eliminated the "species barrier" thought to afford members of one species some degree of protection from prions derived from a different species. Approximately 250 days after being inoculated with prions from diseased cows, the transgenic mice developed the disease. A second group of mice inoculated with prions from the diseased mice became sick after a virtually identical period of time, confirming that the transgenic mice transmit mad cow disease prions with no detectable change of strain or properties specific to the species and attributable to the mice themselves. Most significantly, inoculation of the transgenic mice with prions from human cases of the new form of Creutzfeldt-Jakob disease produced the same incubation period and pattern of brain damage as had inoculation with prions from diseased cows.

Additionally, inoculation of transgenic mice with prions from sheep with scrapie, another prion-related disease causing neurological damage, produced prions with dramatically different biological properties.

This work was supported by the National Institutes of Health and the G. Harold and Leila Y. Mathers Foundation.

Reprinted from *Academy of Sciences (PNAS).*

NEWS

## Food Recalls: How Can You Prepare? Insurance Brokers Service Offers Advice to Businesses

A series of food recalls in December prompted Insurance Brokers Service, Inc. (IBS) president and COO Bob Greenebaum to offer the following advice to food companies: Get coverage. "The truth is, for big and small food producers alike, recalls can cost millions of dollars in product losses and operational delays, not to mention intangible losses to a company's reputation and customer confidence," Greenebaum said. "Protecting the consumer is the number one priority in a product recall. But can you do so without crippling your business?"

Greenebaum, whose company offers product recall insurance for food companies, stresses that while manufacturers and processors may have an understanding of the operational aspects of a recall – which regulators to notify, how to contain the exposed product and how to track a problem – they may not have a plan that incorporates these logistical requirements with reputation-saving communications efforts. He suggests that companies must be prepared to deal with a recall from several angles, including financial protection, logistical planning and effective communication with the public and media.

Currently, there are a number of different insurance products on the market offering financial coverage for both accidental contamination and products tampering. For example, IBS's Total Recall PLUS product includes a unique crisis management component that assists companies both with logistics and communications considerations, as well as real-time crisis support to safeguard the insured's reputation.

Again emphasizing the growing number of recalls, Greenebaum advises companies to prepare for a worst case scenario. "It's an up-front investment that can save your company."

## Collaboration to Help Thwart Foodborne Pathogens

High-quality, fresh-cut melon and tomatoes that are free of microbial pathogens are the goal of Agricultural Research

Service scientists and industry cooperators who have teamed up in a joint research project.

Scientists at the ARS Eastern Regional Research Center's Plant Science and Technology Research Unit in Wyndmoor, PA, have entered into a two-year Cooperative Research and Development Agreement with EPL Technologies, Inc., in Philadelphia, PA News. Retailers have long desired a way to produce fresh-cut tomatoes and melons safely, but haven't pursued this market due to product quality problems and food safety concerns caused by inadequate cold temperatures during distribution.

Melons and tomatoes have been associated with foodborne illnesses from *Salmonella* contamination in the past. *Salmonella* heads the list as one of the most common causes of foodborne illnesses, with about 40,000 salmonellosis cases reported yearly, according to the federal Center for Disease Control and Prevention.

ARS researchers have already developed improved methods for extending the shelf life of perishable fruits and vegetables. Under the agreement with EPL Technologies, they plan to develop novel methods for reducing or removing pathogenic bacteria from fresh-cut fruits. These methods should be friendly alternatives to common washing agents, such as chlorine, which are used to rid fresh-cut foods of microbial pathogens. Previous ARS studies and others have shown limitations with conventional washing and sanitizing agents in reducing microbes on fruit surfaces.

This technology is needed in the fresh-cut market, which grows at a rate of 20 percent annually. Most of this growth, however, is in the fresh-cut vegetable market. This research should allow fresh-cut manufacturers to expand their markets and make healthy fresh-cut products available to a larger group. Successful introduction of these products will have a major impact on growers and shippers.

## USDA Approves Irradiation of Meat to Help Improve Food Safety

Industry will soon be able to irradiate raw meat and meat products such as ground beef, steaks, and pork chops to reduce significantly or eliminate *E. coli* O157:H7 and other hazardous microorganisms, Agriculture Secretary Dan Glickman announced on Dec. 14, 1999. "While there is no single silver bullet to cure all food safety problems, irradiation has been shown to be both safe and effective," said Glickman. "USDA is committed to approving new technologies that offer industry additional tools to help produce even safer food."

Food irradiation is the process of exposing food to high levels of radiant energy to reduce or eliminate potentially dangerous microorganisms on meat and poultry. The Food and Drug Administration (FDA), which approves food additives such as irradiation, determined in December 1997 that irradiation of raw meat is safe.

Irradiation is currently the only known method to eliminate deadly *E. coli* O157:H7 bacteria in raw meat. The technology also significantly reduces levels of *Listeria*, *Salmonella*, and *Campylobacter* on raw product.

However, consumers need to continue to handle and prepare irradiated meat and poultry as they would other raw products because some bacteria, especially spoilage organisms, are not destroyed by irradiation, and bacteria from other foods can cross-contaminate irradiated foods.

Under USDA's plan, which will take effect in mid-February 2000, radiation will be permitted to treat refrigerated or frozen raw meat and meat products.

As with other antimicrobial interventions USDA has approved for meat and poultry, irradiated products must still meet all other food safety requirements, including sanitation and pathogen reduction standards.

Ensuring consumer choice, USDA is requiring that irradiated meat and meat products bear the radura international symbol for irradiation, and a statement that the product was treated by irradiation. Irradiated meat used in other products such as sausages and bologna also must be labeled. For unpackaged meat products that do not have labels, the statement and logo must be displayed at the point of sale to consumers. These labeling requirements do not apply to products purchased through foodservice operations, such as restaurants.

In a related action, USDA is streamlining the approval process for food additives by ending the requirement that food additives be approved separately by both FDA and USDA. Currently, once FDA approves a food additive, USDA must conduct separate rulemaking in order for it to be approved for use in meat or poultry. This regulatory reform effort will pave the way for the use of irradiation on ready-to-eat products such as luncheon meat. On August 23, 1999, a consortium of industry organizations petitioned FDA to approve irradiation for processed meat and poultry products.

## Early Warning and Response System for Communicable Diseases Becomes Fully Operational

The European Commission adopted two important decisions concerning the setting up of an early warning and response system for communicable

diseases. Terms of action are now clearly defined and communicable diseases and special health issues identified. The system will be run by the European network for the epidemiological surveillance and control of communicable diseases which was which was set up in 1998. The network focuses on the permanent surveillance of tuberculosis, travel associated legionnaires' disease, AIDS and HIV, human salmonellosis and the bacteria *E. coli* O157. This list has now been extended to include a range of other diseases.

David Byrne, Commissioner for Health and Consumer Protection welcomed the adoption of the management guidelines for the early warning and response system: "These two decisions bring the operation of the network to full speed. They set out the principles of the early warning and response system for communicable diseases. Rapid reaction to threats to public health from communicable diseases is one of the priorities of the Commission's policy in this field. We need to be increasingly alert to the huge threat to health from many communicable diseases. As Europe becomes increasingly integrated, there is a corresponding increase in the ease with which such diseases can be transmitted. We need, therefore, to have well developed mechanisms to identify suspected or actual outbreaks and to take the appropriate measures to bring them under control."

The first decision clearly identifies the "terms of action" that will be dealt with by the early warning and response system of the community network. These are "events," which by themselves or in association with other similar events, are or have the potential to become public health threats. The decision furthermore describes the procedures for information, consultation and cooperation under the early warning and response system.

The second decision identifies the communicable diseases and special health issues which have to be covered by epidemiological surveillance in the community network. The network will progressively cover, amongst others, influenza, hepatitis A, B, C, malaria, other diseases preventable by vaccination – e.g. diphtheria, measles, mumps, sexually transmitted diseases, food and waterborne diseases and diseases of environmental origin, diseases transmitted by non-conventional agents (e.g. Creutzfeldt-Jakob-disease) airborne diseases, zoonoses, serious imported diseases e.g. cholera, plague. The growing resistance against antibiotic agents will also be observed attentively by means of the European network. This will contribute to ensure timely reaction on this major threat for human health through guidance to health professionals and the public and adaptation of legislation to scientific findings.

The Commission has now the tools to allow the network to become fully operational. The early exchange and analysis of data within the network will improve the rapid reaction to emergencies and as such the prevention of communicable disease outbreaks inside and outside the community.

## Achievements in Public Health, 1900-1999

According to the U.S. Centres for Disease Control, the Ten Great Public Health Achievements –United States, 1900-1999 are:

- Vaccination
- Motor-vehicle safety
- Safer workplaces
- Control of infectious diseases
- Decline in deaths from coronary heart disease and stroke
- Safer and healthier foods
- Healthier mothers and babies
- Family planning
- Fluoridation of drinking water
- Recognition of tobacco use as a health hazard

These 10 public health achievements highlighted in MMWR reflect the successful response of public health to the major causes of morbidity and mortality of the 20th century. In addition, these achievements demonstrate the ability of public health to meet an increasingly diverse array of public health challenges. The full report, available at www.cdc.gov/mmwr, highlights critical changes in the US public health system this century.

## Leatherhead Food RA Announces a New Journal

*Food Allergy and Intolerance – a Journal for the World Food Industry*, is a new journal to be launched by Leatherhead Food Research Association in 2000. To be published three times a year, the journal will appeal to food technologists, nutritionists and technical personnel in the food industry, as well as clinicians and other health professionals. The journal will contain articles by international experts in food allergy and intolerance, and all articles will be reviewed by an editorial board of experts.

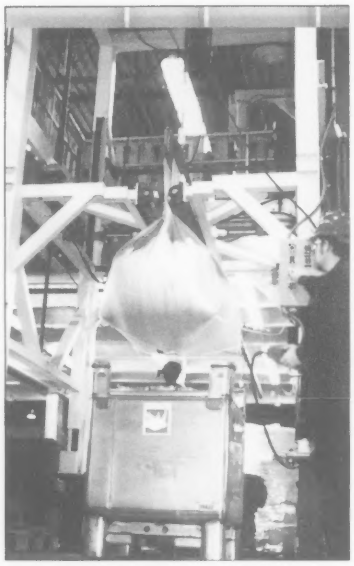
Key areas covered by the journal will include:

- Guidelines and advice for industry aimed at good practice during food manufacture and processing.
- Legislation issues and other legal requirements of food manufacturers, and liability issues of concern to food manufacturers and retailers, including labelling information and advice.
- The latest and clinical research into the causes of food allergy and intolerance (including milk, eggs, wheat, soya, peanut/nut, fish, shellfish and additives, etc.). Information on the prevalence of food allergy and intolerance.
- Commerically available analytical kits for detecting food allergens.
- The development of vaccines and other treatments for victims of allergic reactions.

Each issue of the journal will also contain regular features on new research, food allergy and intolerance in the media and internet sites relevant to the subject.

For further information, please contact the Publications Department at Leatherhead Food RA on 44.0.1372.376.761; Fax: 44.0.1372.822.374; E-mail: publications@lfra.co.uk.

# Industry**Products**



*Custom Packaging Systems, Inc.*

## Unique Rhino™ Squeeze Bag from Custom Packaging Systems, Inc.

The Rhino™ Squeeze Bag from Custom Packaging Systems provides a reusable semi-bulk package holding up to 2,200 pounds of viscous and heavy liquids that completely discharges contents in a clean, efficient and ergonomic operation. The design of the Rhino Squeeze Bag features Custom Packaging's exclusive cone-shaped bottom for fast flow and complete discharge of thick and highly viscous liquid products. An internally secured form-fit liner aids in preventing product entrapment in the bag and assures expulsion of residual product that might otherwise be trapped in the bag's bottom.

Holding up to 2,200 pounds of product, the Squeeze Bag offers an economical, labor-saving alternative to drums, totes, and trucks. Once the product is discharged and the liner removed, the self-folding squeeze bag will weigh only 9 pounds and may be reused for additional cost savings, or easily recycled or disposed of.

The Rhino Squeeze Bag is constructed of USDA and FDA approved materials, and is designed with a durable woven polyethylene or polypropylene outer bag and a multiply poly form-fit inner disposable liner. The special design of the liner, which is taped and tied to the tough outer bag, prevents the liner from collapsing during discharge and keeps the liner securely in place until removal. The liner is available in barrier films to maintain shelf life.

Custom Packaging Systems, Inc., Manistee, MI

**Reader Service No. 234**

## New RapidVap® $N_2$ Evaporation Systems from Labconco

Labconco Corporation, has introduced the redesigned New RapidVap $N_2$ Evaporation System. The new RapidVap $N_2$ Evaporation System directs a stream of nitrogen or dry gas downward onto the surface of the samples to speed evaporation and help remove the solvent as it evaporates. The RapidVap $N_2$ offers a more efficient automatic alternative to Kuderna-Danish and rotary evaporators.

The combination of vortex action, heat and nitrogen blow down accelerate evaporation. The Teflon-coated aluminum sample block holds eight large samples, up to 450 milliliters each. The redesigned RapidVap $N_2$ System also has improved chemical compatibility, and up to nine different protocols can be entered into memory.

Labconco Corporation, Kansas City, MO

**Reader Service No. 235**

## Groen Releases New Process Equipment Solutions Guide

Groen has released a new Process Equipment Solutions Guide which they are making available to food, confectionary, cosmetic, pharmaceutical and chemical manufacturers worldwide. This handy 12-page booklet provides both batch and continuous processing equipment solutions for a wide range of product heating and chilling applications.

"Groen also offers unique continuous heat transfer systems built around multi-tube thin film evaporators; single unit scraped surface heat exchangers, that are sized by throughput volume; and

fully jacketed continuous screw coaters," stated John Jasper, Groen's director of process equipment sales. "While atmospheric processing with steam heat transfer is popular, we can also provide efficient hot water and hot oil systems, and kettles that use pressure or vacuum for faster heating and cooling."

The Groen Process Equipment mini-catalog includes a handy mixing action selection guide to the broad range of agitator configurations available with Groen's Premier™ and Elite™ lines of hemispheric bottom kettles. This colorful catalog also covers Groen's line of pilot plant and laboratory equipment; a line of flush mounted and in-line sanitary ball valves; and their CapKold® cook-and-chill refrigerated foods production systems.

Groen Process Equipment Group, Elk Grove Village, IL

Reader Service No. 236

## Simply Affordable Leak Testing for Sealed Liquid-Filled Containers or Packages from Cincinnati Test Systems, Inc.

Cincinnati Test Systems, Inc., has introduced a new Sentinel MD Moisture Detection instrument to accurately evaluate test results and determine leaks utilizing non-destructive methods of controlling and monitoring the atmospheric pressure in a vacuum chamber. This sophisticated instrument has been simplified for operator convenience and packaged for an affordable cost of verifying product integrity (possibly down stream from a liquid fill and seal operation).

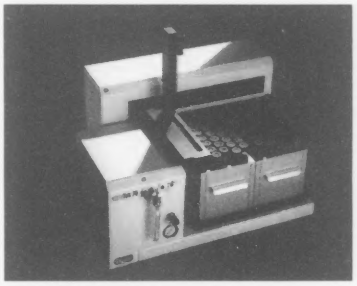
Technically it works by controlling and monitoring the evacuation of the test chamber to below the boiling point of the liquid. At this point any leakage from the container will effect the rate of evacuation of the chamber, the retention of vacuum in the chamber and the characteristics of the vacuum response. Total cycle time can be less than 15 seconds depending on the part and leak size, etc.

The Sentinel MD provides three inputs and outputs for interface to PLCs or external devices allowing the flexibility to perform simple leak test functions or economically interface with a PLC operated system. (Inputs: start test, stop test, and one programmable for either remote Auto Cleanup or Part Present to start test. Outputs: accept, reject and one programmable for Seal or External Exhaust.)

Reject values for evacuation pressure, test pressure, and response fit are easily set through the operator panel. The evacuation pressure, test pressure, and response fit are stored for up to 100 parts and can be easily reviewed by the operator or output to a printer or computer via the RS232 port.

Cincinnati Test Systems, Inc., Village of Cleves, OH

Reader Service No. 237



*Tekmar-Dohrmann*

## Tekmar-Dohrmann Increases Lab Productivity with the AQUATek 70

Laboratories have productivity challenges that must be met to survive in their competitive markets. The AQUATek 70 combined with the 3100 Sample Concentrator is designed to handle beverage samples such as fruit juices, carbonated beverages, water and beer. Virtually all sample preparation of beverage samples is eliminated with automatic sample measurement, automatic standard addition, and high temperature OptiRinse. Performance benefits of the AQUATek 70 include minimized standard usage, excellent precision with automatic standard addition, reduced carryover with high temperature OptiRinse and a vial transport system with proven reliability.

Tekmar-Dohrmann, Cincinnati, OH

Reader Service No. 238

## Osmonics® UltraFilic® M-Series Membrane Engineered to be "Fouling-Free"

The separation of oil and water by ultrafiltration (UF) is a proven technology, but its widespread utilization for wastewater minimization or recycling applications has three common problems: (1) fouling from "free" oil which overflows from upstream pretreatment; (2) fouling from free oil which de-emulsifies as the feed is concentrated; and (3) fouling and decomposition of the membrane from accidental contamination of the waste stream by aggressive solvents. The new M-Series by Osmonics is a technologically superior UltraFilic membrane element that will resist these obstacles.

M-Series membranes are made of a chemically-modified polyacrylonitrile (PAN) polymer. As opposed to conventional "oil attracting" membranes, these membranes are engineered to be extremely "water attracting,"

which helps prevent fouling from free oils. The membranes are designed with an asymmetric pore morphology that prevents oil and dirt molecules from being trapped in the depths of the pore. Available in a wide range of sizes, the membranes meet the objectives of most applications.

Because of this element's chemical stability and performance versatility, there is no need to neutralize the waste stream prior to filtration. It is also possible to recycle most aqueous cleaners online at their operating temperatures. M-Series technology may be applied to numerous industrial applications including petroleum, gas, chemical, food, automotive, laundry, metal finishing, pharmaceutical, and textile.

Osmonics, Colorado Springs, CO

**Reader Service No. 239**

## New Maximum Free Passage Fulljet® Nozzle from Spraying Systems Co.

The new Maximum Free Passage (MFP) FullJet nozzle, from Spraying Systems Co., offers the industry's free passage of any full cone spray nozzle of its type. The nozzle's maximum solids passage capability translates into consistent coating, cooling, blanching, washing, and rinsing.

The MFP FullJet nozzle features a patent-pending design that provides maximum spherical diameter free passage with outstanding spray performance. The design results in uniform distribution of liquid throughout the spray pattern for higher performance in spraying applications. The stable spray has consistent edges without fluttering.

The MFP nozzles are available in all 316 stainless steel or a brass body with a 316 stainless steel vane. They feature NPT and BSPT inlet connections from 3/8" to 3" standard spray angles of 60° and 90° and wide spray angles of 115°.

Spraying Systems Co., Wheaton, IL

**Reader Service No. 240**

*Eriez Magnetics*

## Major Advancement in New Rare Earth Tube Magnet Surpasses Current Separation Levels by 40% by Eriez Magnetics

Forty percent stronger than standard magnets, Eriez' new RE5HP Rare Earth tube magnets, powered by Erium® 3000, provide the highest level of separation efficiency of any tube magnet on the market today. State-of-the-art circuit geometry and increased holding power improve separation of fine and weakly magnetic contaminants in processing applications such as pharmaceutical/chemical powders, liquid lines and food processing.

The higher strength of the RE5HP holds finer contaminants even more tightly to its surface to ensure the removal of fine metal contamination – virtually eliminating wash-off by product flow. Designed with the same dimensional envelope as its predecessors, the RE5HP can retrofit into existing grates and traps to effectively prevent machinery damage and ensure product purity.

"The new RE5HP tube magnet keeps downtime associated with metallic contamination to a minimum. And, it offers increased holding force, higher gauss rating and improved separation efficiency – at no additional cost," says Dave Heubel, product manager, separation.

Eriez Magnetics, Erie, PA

**Reader Service No. 241**

## Molecular Biology Grade Ethanol Increases DNA Yield from Sigma

The broad range of products for molecular biology from Sigma-Aldrich now includes both 95% (190 proof) and 100% (absolute, 200 proof) benzene-free nondenatured alcohol. Use-tested for nucleic acid precipitation, Molecular Biology Grade Ethanol is only available from Sigma-Aldrich. It has no detectable DNase, RNase, or Nickase activity. This eliminates the need for researchers to worry about contamination or compromising the results of an experiment, thus saving time, aggravation, and money.

Purchasing non-denatured ethanol typically requires separate payment of federal excise tax. Sigma-Aldrich prepays the tax and includes it in the purchase price as a convenience for customers. This eliminates the need for alternative suppliers and allows researchers to Purchase Molecular Biology Grade Ethanol, with other products through normal purchasing channels. This makes additional customer record keeping for excise tax purposes unnecessary.

Sigma, St. Louis, MO

**Reader Service No. 242**

*Dairy, Food and Environmental Sanitation, Vol. 20, No. 2, Pages 143-164*


# Holders of 3-A Symbol Council Authorization as of January 31, 2000

Questions or statements concerning any of the holders' authorizations listed below, model numbers or the equipment fabricated should be addressed to: Administrative Officer, 3-A Symbol Council, 1500 Second Avenue, SE, Suite 209, Cedar Rapids, IA 52403; Phone 319.286.9221; Fax 319.286.9290

## 01-07 Storage Tanks for Milk and Milk Products

2 APV Americas – Lake Mills
100 South CP Ave.
Lake Mills, WI 53551

117 DCI, Inc.
P.O. Box 1227, 600 No. 54th Ave.
St. Cloud, MN 56301

127 Paul Mueller Co.
1600 W. Phelps St.
Springfield, MO 65801

440 Scherping Systems
801 Kingsley St.
Winstead, MN 55395

31 Walker Stainless Equipment Co., Inc.
902 - 2nd Main St.
Elroy, WI 53929-0126

## 02-09 Pumps for Milk and Milk Products

975 Alfa Laval Pumps Ltd.
Birch Road
Eastbourne, East Sussex
BN23 6PQ, England
(Not Available in the USA)

976 Alfa Laval Flow
Birch Road
Eastbourne, East Sussex
BN23 6PQ, England
(Not Available in the USA)

63R APV Americas – Lake Mills
100 South CP Ave.
Lake Mills, WI 53551

946 APV Americas – Lake Mills
100 South CP Ave.
Lake Mills, WI 53551-1799

568 Allweiler AG, Werk Bottrop
Kirchhellener Ring 77-79
D-46244 Bottrop
Germany
(US Rep.: Shanley Pump and Equipment, Inc.
2525 South Clearbrook Drive
Arlington Heights, IL 60005)

793 Ampco Pumps Co.
4000 W. Burnham St.
Milwaukee, WI 53215

212R Babson Brothers Company
Dairy Systems Division
20903 West Gale Ave.
Galesville, WI 54630-0659

999 Blackmer/Mouvex
1809 Century Ave., SW
Grand Rapids, MI 49509

923 Bombas Bornemann S.R.L.
Armenia 2898 (1605)
Munro, Argentina
(US Rep.: Bornemann Pumps, Inc.
P.O. Box 1769
Matthews, NC 28105)

205R Boumatic
1919 S. Stoughton Road
P.O. Box 8050
Madison, WI 53716

739 CSF Inox S.P.A.
Strada per Bibbiano
7 – Montecchio E. (RE)
Italy
(US Rep.: Sanchelima Intl.
1781-83 N.W. 93rd Ave.
Miami, FL 33172)

709 Conexiones Inoxidables
De Puebla S.A. de C.V.
Vicente Guerrero No. 211
Xicotepec de Juarez
Edo, Puebla, Mexico
(US Rep.: Ben Dolphin Consulting
4735 Lansing Drive
North Olmsted, OH 44070)

820 Drum Industries, Inc.
2501 Constant Comment Place
Louisville, KY 40299

671 Flowtech Inc.: - Teknoflow, Inc.
1701 Spinks Drive
Marietta, GA 30067

466 Fluid Metering, Inc.
5 Aerial Way, Suite 500
Syosset, NY 11791

828 Flux Pumps Corp.
4430 Commerce Circle
Atlanta, GA 30336

306 Fristam Pumps, Inc.
2410 Parview Road
Middleton, WI 53562

65R Alfa Laval Flow Inc./G & H Products
8201 - 104th St., P.O. Box 581909
Pleasant Prairie, WI 53158-0909

325 Johnson Pumps (U.K.) Ltd.
Highfield Industrial Estate
Edison Road, Eastbourne
East Sussex, England BN23 6PT
(US Rep.: Viking Pump, Inc.
406 State St., Box 8
Cedar Falls, IA 50613)

145R ITT Jabsco Products
1485 Dale Way
Costa Mesa, CA 92626

502 Inoxpa, s.a.
Carrer Dels Telers, 54
17820 Banyoles
Spain
(US Rep.: Jensen Fittings Corp.
107-111 Goundry St.
North Tonawanda, NY 14120)

314 Len E. Ivarson, Inc.
3100 W. Green Tree Road
Milwaukee, WI 53209

997 Joh. Heinr. Bornemann GmbH
Industriestrasse 2
D-31683
Obernkirchen, Germany

603 Johnson Pump (UK) Ltd.
Highfield Industrial Estate
Edison Rd. Eastbourne
East Sussex, England BN236PT
(US Rep.: Viking Pump, Inc.
406 State St., Box 8
Cedar Falls, IA 50613)

604 Johnson Pump (UK), Ltd.
Highfield Industrial Estate
Edison Rd. Eastbourne
East Sussex, England BN236PT
(US Rep.: Viking Pump, Inc.
406 State St., Box 8
Cedar Falls, IA 50613)

841 Johnson Pump (UK), Ltd.
Highfield Industrial Estate
Edison Rd. Eastbourne
East Sussex, England BN236PT
(US Rep.: Viking Pump, Inc.
406 State St., Box 8
Cedar Falls, IA 50613)

996 Johnson Pump (UK), Ltd.
Highfield Industrial Estate
Edison Rd. Eastbourne
East Sussex, England BN236PT

673 Alfa Laval Pumps, Inc.
9201 Wilmot Road
Kenosha, WI 53142

654 Mono Pumps Ltd., Dresser Pump Div.
Martin St.
Audenshaw, Manchester
England M34 5DQ
(US Rep.: Monoflo, Dresser Pump Division
Dresser Industries
821 Live Oak Drive
Chesapeake, VA 23320-2601)

400 Netzsch Incorporated
119 Pickering Way
Exton, PA 19341-1393

827 PACKO Diksmuide, NV
Cardijnlaan 10
B8600 Diksmuide, Belgium
(Not available in the USA)

701 Pierre Guerin SA
BP. 12 - 79210
Mauze-Sur-Le-Mignon
France
(Not available in the USA)

241 Puriti, S.A. de C.V.
Alfredo Nobel 39
Industrial Puente de Vigas
Tlalnepantla, Mexico
(US Rep.: Waukesha Cherry-Burrell
611 Sugar Creek Road
Delavan, WI 53115)

148R Moyno Industrial Products
A Division of Robbins & Myers, Inc.
P.O. Box 960
Springfield, OH 45501-0960

810 O.M.A.C. SRL Pompe
Via G. Falcone 8, I-42948
Rubiera (RE) Italy
(US Rep.: Sanchelima International, Inc.
1781-83 N.W. 93rd Ave.
Miami, FL 33172)

934 Pladot Ein Harod
Kibbutz Ein Harod Meuhad
18965
Israel
(US Rep.: Robert E. Turner
P.O. Box 4595
Gettysburg, PA 17235-4595)

1004 Q.-Pumps,. S.A. de C.V.
Acceso A #108, Fracc.
Inc. Jurica, 76130
Queretaro, Mexico
(US Rep,: Q.-Pumps, S.A.
P.O. Box 148
Zion, IL 60099)

595 seepex, Inc.
511 Speedway Drive
Enon, OH 45323

678 Shanley Pump & Equipment, Inc.
2525 S. Clearbrook Drive
Arlington Heights, IL 60005

911 Sigma Equipment Corp.
39 Westmoreland Ave.
White Plains, NY 10606

507 Sine Pump
c/o Sundstrand Fluid Handling
14845 West 64th St.
Arvada, CO 80007

567 Stainless Products, Inc.
1649 72nd Ave.
P.O. Box 169
Somers, WI 53171

72R L.C. Thomsen Inc.
1303 43rd St.
Kenosha, WI 53140

26R Tri-Clover, Inc.
P.O. Box 1413
Kenosha, WI 53141-1413

1011 Tuchenhagen North America, Inc.
9160 Branch Road
Columbia, MD 21045

899 Lederle GmbH Pumpen
Und Maschinenfabrik
Gundelfingen, Germany
(US Rep,: Alto Systems Inc.
P.O. Box 60667
Houston, TX 77205)

52R Viking Pump, Inc.
A Unit of IDEXX Corporation
406 State St., P.O. Box 8
Cedar Falls, IA 50613

29R Waukesha Cherry-Burrell
611 Sugar Creek Road
Delavan, WI 53115

### 04-04 Homogenizers and Reciprocating Pumps

75 APV Gaulin
500 Research Drive
Wilmington, MA 01887

390 American Lewa, Inc.
132 Hopping Brook Road
Holliston, MA 01760

247 Bran & Luebbe, Inc.
1025 Busch Parkway
Buffalo Grove, IL 60015

657 Microfluidics International, Corp.
P.O. Box 9101
30 Ossipee Road
Newton, MA 02164-9101

558 Niro Soavi S.p.A.
VIA M. Da Erba Edoari, 29/A
43100 Parma (Italy)
(Distributed in the US by:
Niro Hudson, Inc.
1600 Country Road F
Hudson, WI 54016)

847 Stork Food & Dairy Systems, Inc.
P.O. Box 1258
1024 Airport Parkway
Gainesville, GA 30503

770 Tetra Pak, Inc.
101 Corporate Woods Parkway
Vernon Hills, IL 60061

87 Waukesha Cherry-Burrell
611 Sugar Creek Road
Delavan, WI 53115

### 05-14 Stainless Steel Automotive Milk Transportation Tanks for Bulk Delivery and/or Farm Pick-up Service

379 Brenner Tank Mauston, Inc.
N. 3760 Hwy. 12 & 16
Mauston, WI 53948

756 Beall Trailers of CA
1301 South Ave.
Turlock, CA 95380-5108

70R Brenner Tank, Inc.
450 Arlington Ave., P.O. Box 670
Fond du Lac, WI 54936

40 Hills Stainless Steel & Equipment Co., Inc.
505 W. Koehn St.
Luverne, MN 56156

513 Nova Fabricating, Inc.
404 City Road
P.O. Box 213
Avon, MN 56310

85 Polar Tank Trailer, Inc.
Holdingford, MN 56340

653 Tremcar
1, Tougas St.
Iberville, Quebec, J2X 2P7 Canada
(US Rep.: Bay State Tr. & Tr.
527 Winthrop
Rehobeth, MA 02769)

25 Walker Stainless Equip. Co., Inc.
625 State St.
New Lisbon, WI 53950

437 West-Mark
2704 Railroad Ave., P.O. Box 100
Ceres, CA 95307

943 LBT Stainless, Inc.
Route 5, Box 480
Manning, SC 29102

### 10-03 Milk and Milk Products Filters Using Disposable Filter Media

593 Filtration Systems
Div. of Mechanical Mfg. Corp.
10304 N.W. 50th St.
Sunrise, FL 33351

435 Sermia International
771 Boul. Industriel
Blainville, Quebec
Canada J7C 3V3
(US Rep.: Edward W. Fox, Jr.
1200 Rolling Ridge Way, #403
Bloomington, IN 47403)

296 L.C. Thomsen, Inc.
1303 43rd St.
Kenosha, WI 53140

711 Kusel Equipment Co.
820 West St.
Watertown, WI 53094

1024 Ultrafilter, Inc.
3560 Engineering Drive
Norcross, GA 30092

1026 Pall Europe Ltd.
Walton Road
Portsmouth, Hampshire PO6 1TD England

35 Tri-Clover, Inc.
P.O. Box 1413
Kenosha, WI 53141-1413

### 11-05 Plate-type Heat Exchangers for Milk and Milk Products

880 AGC Engineering
8869 SE 58th St. Ave.
Portland, OR 97206

365 APV Heat Exchanger AS
Platinvej, 8
P.O. Box 329
DK-6000 Kolding
Denmark
(Not available in the USA)

20 APV Americas
395 Fillmore Ave.
Tonawonda, NY 14150

120 Alfa-Laval, Agri, Inc.
11100 No. Congress Ave.
Kansas City, MO 64153

17 Tetra Pak Engineering
101 Corporate Woods Parkway
Vernon Hills, IL 60061

718 Babson Bros. Co.
Dairy Systems Div.
1400 West Gale Ave.
Galesville, WI 54630

30 Waukesha Cherry-Burrell
Process Equipment Division
P.O. Box 35600
Louisville, KY 40232-5600

14 Chester-Jensen Co., Inc.
5th & Tilghman Sts., P.O. Box 908
Chester, PA 19016

791 The Coburn Co., Inc.
834 E. Milwaukee St., Box 147
Whitewater, WI 53190

468 GEA Ecoflex North America, Inc.
7150 Distribution Drive
Louisville, KY 40258-2528

622 ITT Standard
175 Standard Parkway
Cheektowaga, NY 14227

414 Paul Mueller Co.
P.O. Box 828
Springfield, MO 65801

912 Pladot Ein Harod
Kibbutz Ein Harod Meuhad
18965 Israel
(US Rep.: Robert E. Turner
P.O. Box 4595
Gettysburg, PA 17235-4595)

279 The Schlueter Company
3410 Bell St., P.O. Box 548
Janesville, WI 53547-0548

650 API Schmidt-Bretten, Inc.
2777 Walden Ave.
Buffalo, NY 14225

670 Flomax International, Ltd.
2 Robert St.
P.O. Box 14537
New Zealand
(US Rep.: Masport, Inc.
6140 McCormick Drive
Lincoln, NE 68507)

1005 Schmidt Thermal Processing Ltd.
P.O. Box 31-247
Milford, Auckland, New Zealand
(US Rep.: Westfalia Dairy Systems, Inc.
1862 Brummel Drive
Elk Grove Village, IL 60007)

658 Thermaline
180-37th St.
Auburn, WA 98001

885 Tranter, Inc. Texas Division
1900 Old Burk Hwy
Wichita Falls, TX 76304

610 Universal Dairy Equipment
11100 N. Congress Ave.
Kansas City, MO 64153

### 12-05 Tubular Heat Exchangers for Milk and Milk Products

886 API Ketema Heat Transfer Technology
2300 W. Marshall Drive
Grand Prairie, TX 75051

438 APV Americas Heat Transfer
395 Fillmore Ave.
Tonawanda, NY 14150

248 Allegheny Bradford Corp.
P.O. Box 200, Route 219 South
Bradford, PA 16701

243 Babson Brothers Company
Dairy Systems Division
20903 Westgale Ave.
Galesville, WI 54630-0659

605 Waukesha Cherry-Burrell
Process Equipment Division
P.O. Box 35600
Louisville, KY 40232-5600

103 Chester-Jensen Co., Inc.
5th & Tilghman Sts., P.O. Box 908
Chester, PA 19016

712 Enerquip, Inc.
North Road
P.O. Box 467
Medford, WI 54451

889 FMC Corporation-FranRica Systems
P.O. Box 30127
Stockton, CA 95213-0127

298 Feldmeier Equipment, Inc.
6800 Town Line Road
P.O. Box 474
Syracuse, NY 13211

217 Girton Manufacturing Co.
P.O. Box 900
Millville, PA 17846

711 Kusel Equipment Co.
820 West St.
Watertown, WI 53094

238 Paul Mueller Co.
P.O. Box 828
Springfield, MO 65801

96 C.E. Rogers Co.
1895 Frontage Road, P.O. Box 118
Mora, MN 55051

532 Scherping Systems
801 Kingsley St.
Winsted, MN 55395

971 Hydro-Thermal Corporation
400 Pilot Court
Waukesha, WI 53188

392 Stork Food & Dairy Systems, Inc.
P.O. Box 1258
1024 Airport Parkway
Gainesville, GA 30503

614 Tetra Pak Processing Systems
101 Corporate Woods Parkway
Vernon Hills, IL 60061

951 Thermaline, Inc.
180 37th St. N.W.
Auburn, Washington 98001

632 Yula Corporation
330 Bryant Ave.
Bronx, NY 10474

1058 Peterson Custom Stainless, Inc.
1100 Industrial Drive
Watertown, WI 53094

### 13-09 Farm Milk Cooling and Holding Tanks

802 Refinox S.A. DE C.V.
Ind. Torreon, Coah, Mexico
(US Rep.: James Read
M.E. Stainless
601 High Plain Drive
Bel Air, MD 21014)

49R Alfa Laval Agri, Inc.
11100 North Congress Ave.
Kansas City, MO 64153

240 Babson Brothers Company
Dairy Systems Division
P.O. Box 659
Galesville, WI 54630

4R Bou-matic, The Dairy Equipment
Division of DEC, International
1919 S. Stoughton Road
Madison, WI 53708-8050

12R Paul Mueller Co.
1600 W. Phelps, P.O. Box 828
Springfield, MO 65801

611 Universal Dairy Equipment
11100 N. Congress Ave.
Kansas City, MO 64153

### 16-05 Evaporators and Vacuum Pans for Milk and Milk Products

132 APV Americas
182 Wales Ave.
Tonawanda, NY 14150

277 Contherm, Inc.
P.O. Box 352, 111 Parker St.
Newburyport, MA 01950

500 Dedert Corporation
20000 Governors Drive
Olympia Fields, IL 60461

186R Marriott Walker Corp.
925 E. Maple Road
Birmingham, MI 48011

273 Niro, Inc.
9165 Rumsey Road
Columbia, MD 21045

107R C.E. Rogers Co.
P.O. Box 118
1895 Frontage Road
Mora, MN 55051

299 Stork Food & Dairy Systems, Inc.
P.O. Box 1258
1024 Airport Parkway
Gainesville, GA 30503

### 17-09 Formers, Fillers and Sealers of Single Service Containers for Fluid Milk and Fluid Milk Products

1031 ACMA USA, INC.
501 Southlake Blvd.
Richmond, VA 23236
(US Rep.: AUTOPROD Inc.
5355 115th Ave. North
Clearwater, FL 33760)

939 BWI KP Aerofill
807 West Kimberly Road
Davenport, IA 52808-3848

382 SIG Combibloc, Inc.
4800 Roberts Road
Columbus, OH 43228

192 Evergreen Packaging
2400 6th St. S.W., P.O. Box 3000
Cedar Rapids, IA 52406

488 BWI Fords Holmatic, Inc.
1750 Corporate Drive, Suite 700
Norcross, GA 30093

1009 Federal Manufacturing Company
201 West Walker St.
Milwaukee, WI 53204-0215

1029 FORMSEAL
1 rue de l'Epee Royale
14700 FALAISE
France
(US Rep.: AUTOPROD INC.
5355-115th Ave. No.
Clearwater, FL 33760)

619 Hassia Verpackungsmaschinen GmbH
Heerweg 19
D-63691 Ranstadt
Germany
(US Rep.: Hassia USA, Inc.
1210 Campus Drive West
Morganville, NJ 07751)

735 Kvalitetsproduktion AB
S-693 29 Degerfors, Sweden
(US Rep.: Flowtech, Inc.
1900 Lake Park Drive, Suite 345
Smyrna, GA 30080)

330 Milliken Packaging
P.O. Box 736
White Stone, SC 29353

442 Milliken Packaging
P.O. Box 736
White Stone, SC 29386

137 Elopak, Inc.
30000 South Hill Road
New Hudson, MI 48165

941 Oden Corporation
255 Great Arrow Ave.
Buffalo, NY 14207-3024

989 PACK LINE, Ltd.4, Hapatish St.
Holon 58815
Israel
(US Rep.: Rabbeco, Inc.
2601 Miles Road
Warrensville Heights, OH 44128)

1015 ProTherm Engineering Company
3475 W. Shaw Ave., Suite 106
Fresno, CA 93711

281 Purity Packaging Corp.
800 Kaderly Road
Columbus, OH 43228

967 RAPAK
20939 Cabot Blvd.
Hayward, CA 94545

1001 REMY Equipment
50 Ave. describes Fenots
28109 Dreux, France
(US Rep.: SIDEL, INC.
5600 Sun Court
Norcross, GA 30092)

924 Robert Bosch GmbH
P.O. Box 1127
D-71301
Waiblingen, Germany
(US Rep.: Robert Bosch Corporation
9890 Red Arrow Hwy
Bridgman, MI 49106)

482 Serac, Inc.
300 Westgate Drive
Carol Stream, IL 60188

681 Shikoku Kakoki Co., Ltd.
No. 10-01 Nishinokawa
Tarohachisu, Kitajima-Cho
Itanogun, Tokushima, Japan
(US Rep.: Elopak, Inc.
30000 South Hill Road
New Hudson, MI 48165)

220 Tetra Rex, Inc.
451 East Industrial Blvd.
Minneapolis, MN 55413

1020 Tetra Rex, Inc.
909 Asbury Drive
Buffalo Grove, IL 60089

351 Tetra Pak, Inc.
3300 Airport Road
Denton, TX 76207

694 IPFO International, Inc.
275 Fountainebleau Blvd., Suite 247
Miami, FL 33172

### 19-04 Batch and Continuous Freezers for Ice Cream, Ices, and Similarly Frozen Dairy Foods, as Amended

141 Waukesha Cherry-Burrell
P.O. Box 35600
Louisville, KY 40232-5600

146 Waukesha Cherry-Burrell Corp.
P.O. Box 35600
Louisville, KY 40232-5600

286 Tetra Pak Hoyer, Inc.
P.O. Box 280
Lake Geneva, WI 53147

355 Emery Thompson Machine & Supply Co.
1349 Inwood Ave.
Bronx, NY 10452

### 22-07 Silo-type Storage Tanks for Milk and Milk Products

154 APV Americas – Lake Mills
100 South CP Ave.
Lake Mills, WI 53551

173 DCI, Inc.
P.O. Box 1227, 600 No. 54th Ave.
St. Cloud, MN 56301

312 Feldmeier Equipment, Inc.
6800 Town Line Road
P.O. Box 474
Syracuse, NY 13211

439 JV Northwest, Inc.
390 S. Redwood St.
Canby, OR 97013

155 Paul Mueller Co.
1600 W. Phelps, P.O. Box 828
Springfield, MO 65801

503 Ripley Stainless, Ltd.
RR #3, Suite 41
Summerland, British Columbia V0H 1Z0
Canada

479 Scherping Systems
801 Kingsley St.
Winsted, MN 55395

675 Stainless Fabrication, Inc.
4455 W. Kearney
Springfield, MO 65803

165 Walker Stainless Equipment Co., Inc.
625 State St.
New Lisbon, WI 53950

### 23-02 Equipment for Packaging Viscous Dairy Products

174 APV Crepaco
A Division of APV North America, Inc.
100 South CP Ave.
Lake Mills, WI 53551-1799

902 A.T.S. Engineering, Inc.
7270 Torbram Road, Unit 23
Mississauga, Ontario
Canada L4T 3Y7
(US Rep.: L and A Package Sales
356 Millstone Road
Clarksburg, New Jersey 08510
And Packaging Specialist
4500 Greenville Ave.
Dallas, TX 75206)

366 AUTOPROD, Inc.
5355 – 115th Ave. N
Clearwater, FL 33760

96 BENHIL-GASTI Verpack
Ungsmaschinen GmbH
Jagenbergstrasse 1
D-41468 Neuss
Germany

965 BENHIL-GASTI Verpack
Ungsmaschinen GmbH
Jagenbergstrasse 1
Germany
(US Rep.: Autoprod, Inc.
5355 – 115th Ave. N
Clearwater, FL 34620)

868 Cryovac-Sealed Air Corporation
P.O. Box 464
Duncan, SC 29223-0464

853 Elmar Industries
200 Gould Ave., P.O. Box 245
Buffalo, NY 14043-0245

1030 FORMSEAL
1 rue de l'Epee Royale
14700 Falaise, France
(US Rep.: Autoprod Inc.
5355 115th Ave. North
Clearwater, FL 33760)

674 Hayssen Manufacturing
225 Spartangreen Blvd.
Duncan, SCa 29334

447 GEI International, Inc.
700 Pennsylvania Drive
Exton, PA 19341-0439

942 Oden Corporation
255 Great Arrow Ave.
Buffalo, NY 14207-3024

870 Machinery Engineering & Technology LLC
4634 Case Drive, P.O. Box 1467
Janesville, WI 53546

343 Tetra Pak Hoyer, Inc.
P.O. Box 280
Lake Geneva, WI 53147

679 Consolidated Biscuit Co.
312 Rader Road
McComb, OH 45858

635 Interbake Dairy Ingredients Div.
2821 Emerywood Parkway, Suite 210
Richmond, VA 23294

760 Jordan Manufacturing, Inc.
1688 Country Road 192
Crossville, ALa 35962

537 Osgood Industries, Inc.
601 Burbank Road
Oldsmar, FL 34677

990 PACK LINE, Ltd.
4, Hapatish St.
Holon 58815
Israel
(US Rep.: Rabbeco, Inc.
2601 Miles Road
Warrensville Heights, OH 44128)

666 RapidPak
2530 West Everett St.
Appleton, WI 54914-4958

740 Raque Food Systems, Inc.
11002 Decimal Drive
Louisville, KY 40299

221 Sweetheart Packaging
10100 Reistertown Road
Owing Mills, MD 21117

891 World Cup Packaging Corporation
777 Progressive Lane
South Beloit, IL 61080

### 24-02 Non-Coil-Type Batch Pasteurizers

158 APV Americas – Lake Mills
100 South CP Ave.
Lake Mills, WI 53551-1799

187 DCI, Inc.
P.O. Box 1227, 600 No. 54th Ave.
St. Cloud, MN 56302

166 Paul Mueller Co.
P.O. Box 828
Springfield, MO 65801

1025 Pladot Ein Harod
Kibbutz Ein Harod
Meuhad 18965 Israel
(US Rep.: Robert E. Turner
P.O. Box 4595
Gettysburg, PA 17235-4595)

878 Walker Stainless Equipment
625 State St.
New Lisbon, WI 53950

### 25-02 Non-Coil-Type Batch Processors for Milk and Milk Products

159 APV Americas – Lake Mills
100 South CP Ave.
Lake Mills, WI 53551-1799

188 DCI, Inc.
P.O. Box 1227, 600 No. 54th Ave.
St. Cloud, MN 56301

725 Inox-Tech, Inc.
6705 Route 132
Ville Ste-Catherine
Quebec, Canada JOL 1EO
(US Rep.: Michael Ripka, Pres.
Bionex
1261 E. Meridian Ave.
Payallup, WA 98373)

710 Lee Industries, Inc.
514 West Pine St.
Phillipsburg, PA 16866

167 Paul Mueller Co.
P.O. Box 828
Springfield, MO 65801

687 SANIFAB
528 North St.
Stratford, WI 54484

448 Scherping Systems
801 Kingsley St.
Winsted, MN 55395

520 Stainless Fabrication, Inc.
4455 W. Kearney
Springfield, MO 65803

837 Viatec Process Incorporated
500 Reed St.
Belding, MI 48809

202 Walker Stainless Equip. Co., Inc.
625 State St., P.O. Box 202
New Lisbon, WI 53950-0202

### 26-03 Sifters for Dry Milk and Dry Milk Products

752 Andritz Sprout-Bauer
35 Sherman St.
Muncy, PA 17756

363 Kason Corp.
67-71 East Willow St.
Milburn, NJ 07041

430 Midwestern Industries, Inc.
915 Oberlin Road, P.O. 810
Massillon, OH 44648-0810

185 Rotex, Inc.
1230 Knowlton St.
Cincinnati, Ohio 45223

656 Separator Engineering, Ltd.
810 Ellingham St.
Pointe Clair, Quebec, Canada H9R 3S4
(US Rep.: Kason Corp.
1301 E. Linden Ave.
Linden, NJ 07036)

172 Sweco, Inc.
(Division of Emerson Electric Company)
7120 Buffington Road
Florence, KY 41042

### 27-04 Equipment for Packaging Dry Milk and Dry Milk Products

352 All-Fill, Inc.
418 Creamery Way
Exton, PA 19341

935 Bossar S.A.
Poligono Industrial Roca
C/. San Marti s/n.
08100 Martorelles
(Barcelona)
Spain
(US Rep.: Hayssen Manufacturing Co.
225 Spartangreen Blvd.
Duncan, SC 29334)

831 Custom Equipment Design
1057 Hwy 80 East, P.O. Box 4807
Monroe, LA 71203

618 Yamato Scale Co., Ltd.
5-22- Saemba-Cho
Akashi, Hyogo 673-8788 Japan

625 Ishida Company, Ltd.
44, Sanno-Cho, Shogoin
Sakyo-Ku, Kyoto, Japan
(US Rep.: Heat & Control
21121 Cabot Blvd.
Hayward, CA 94545-1132)

922 Ishida Co., Ltd.
44 Sanno-Cho, Shogoin
Sakyo-Ku
Kyoto, Japan
(US Rep.: Heat & Control, Inc.
21121 Cabot Blvd.
Hayward, CA 94545-1132)

409 GEI International, Inc.
700 Pennsylvania Drive
Exton, PA 19341-0439

905 Pacmac, Inc.
1161 Armstrong Ave.
P.O. Box 360
Fayetteville, AR 72702-0360

998 SIG Pack Eagle Corporation
2107 Livingston St.
Oakland, CA 94606

895 Spiroflow-Orthos Systems, Inc.
2806 Gray Fox Road
Monroe, NC 28110

497 Triangle Package Machinery Co.
6655 West Diversey Ave.
Chicago, IL 60635

**28-03 Flow Meters for Milk and Milk Products**

270 ABB Instrumentation, Inc.
125 E. County Line Road
Warminster, PA 18974

272 Accurate Metering Systems, Inc.
1651 Wilkening Court
Schaumburg, IL 60173

253 Badger Meter, Inc.
4545 W. Brown Deer Road
P.O. Box 23099
Milwaukee, WI 53223

884 Bailey-Fischer & Porter GmbH
Dransfeld Strasse, Gottingen 37079
Germany
(US Rep.: Bailey-Fischer & Porter
125 E. County Line Road
Warminster, PA 18974)

956 Blancett Fluid Flow Meters
100 E. Felix St. South, Suite 190
Fort Worth, TX 76115-3548

979 Bopp & Reuther Messtechnik GmbH
Carl-Reuther Strasse 1
D-68305 Mannheim
Germany
(US Rep.: Metron Technology
2005 – 10th St.
Boulder, CO 80302)

359 Brooks Instrument Division
407 W. Vine St.
Hatfield, PA 19440

660 Danfoss A/S
DK-6430
Nordborg, Denmark
(US Rep.: Danfoss Electronics
2995 Eastrock Drive
Rockford, IL 61109)

950 Delta M Corp.
1003 Larsen Drive
Oak Ridge, TN 37830

692 Endress & Hauser Flowtec AG
Kägenstrasse 7
CH – 4153 Reinach, Switzerland
(US Rep.: Endress & Hauser, Inc.
2350 Endress Place
Greenwood, IN 46143)

226 Bailey Fischer & Porter Co.
125 E. County Line Road
Warminster, PA 18974

477 Flowdata, Inc.
1817 Firman Drive
Richardson, TX 75081-1826

506 Flow Technology, Inc.
4250 East Broadway Road
Phoenix, AZ 85040

224 The Foxboro Company
33 Commercial St.
Foxboro, MA 02035

717 Gemu Valves, Inc.
3800 Camp Creek Parkway
Ste. 102 Bldg. 2400
Atlanta, GA 30331

649 Geo Technology Corporation
12312 E. 60th St.
Tulsa, OK 74146

1035 GRUPPO ISOIL S.p.A.
Via F.lli Gracchi 27
20092 Cinsello Balsamo
Milano, Italy
(US Rep.: Liquid Controls, LLC
105 Albrecht Drive
Lake Bluff, IL 60044-2242)

661 Alfa Laval Flow, Inc.
G & H Division
8201 – 104th St., P.O. Box 581909
Pleasant Prairie, WI 53158-0909

630 Halliburton Services
Drawer 1431
Duncan, OK 73536-0346

574 Aaliant
150 Venture Blvd.
P.O. Box 4584
Spartanburg, SC 29305

512 Hoffer Flow Controls, Inc.
107 Kitty Hawk Lane
Elizabeth City, NC 27909-4585

744 Honeywell IAC
1100 Virginia Drive
Fort Washington, PA 19034

733 Honeywell, Inc.
1100 Virginia Drive
Fort Washington, PA 19034-3260

265 Flow Automation
9303 Sam Houston Parkway South
Houston, TX 77099-5298

535 FMC Invalco, Inc.
(An FMC Corporation Subsidiary)
P.O. Box 1183
Hutchinson, KS 67504

764 Yokogawa Industrial Automation America Inc.
4 Dart Road
Newnan, GA 30265-1040

840 KOBOLD Instr. Inc.
1801 Parkway View Drive
Pittsburgh, PA 12505

871 KOBOLD Instr. Inc.
1801 Parkway View Drive
Pittsburgh, PA 12505

529 KROHNE, Inc.
7 Dearborn Road
Peabody, MA 01960

972 Liquid Controls, LLC
105 Albrecht Drive
Lake Bluff, IL 60044-2242

1034 Liquid Controls, LLC
105 Albrecht Drive
Lake Bluff, IL 60044-2242

778 Magnetrol Intl., Inc.
5300 Belmont Road
Downers Grove, IL 60515

378 Micro Motion, Inc.
7070 Winchester Circle
Boulder, Colorado 80301

932 Nitto Seiko Co., Ltd.
623 Japan, 30
Nobu-Cho
Ayabe Kyoto
(US Rep.: Endress & Hauser Flowtec AG
Division USA
2350 Endress Place
P.O. Box 246-1
Greenwood, IN 46142)

938 norax, Inc.
10728 S. 92nd St.
Franklin, WI 53132

1019 Pacific Flow Controls
170-F Alamo Plaza, Suite 177
Alamo, CA 94507

729 Peek Measurement, Ltd.
Kings Worthy, Winchester
Hampshire, England S023 7QA
(US Rep.: Peek Measurement
10335 Landsbury, Ste. 300
Houston, TX 77099-3407)

490 Rosemount, Inc.
12001 Technology Drive
Eden Prairie, MN 55344

585 Solartron
11321 Richmond Ave.
Houston, TX 77082-2615

587 Schlumberger Ind., Measurement Div.
1310 Emerald Road
Greenwood, SC 29646

550 Sparling Instruments Co., Inc.
4097 N. Temple City Blvd.
P.O. Box 5988
El Monte, CA 91731

715 Thermal Instrument Co.
217 Sterner Mill Road
Trevose, PA 19053

1021 Toshiba Corporation
1, Toshiba-Cho
Fuchu-Shi, Tokyo 183 Japan

803 Turck, Inc.
3000 Campus Drive
Plymouth, MN 55441-2656

### 29-01 Air Eliminators for Milk and Fluid Milk Products

340 Accurate Metering Systems, Inc.
1651 Wilkening Court
Schaumburg, IL 60173

662 Alfa Laval Flow, Inc.
G & H Division
8201 - 104th St., P.O. Box 581909
Pleasant Prairie, WI 53158-0909

436 Scherping Systems
801 Kingsley St.
Winsted, MN 55395

1057 Krebs Engineers
5505 West Gillette Road
Tuscon, AZ 85743

### 30-01 Farm Milk Storage Tanks

421 Paul Mueller Co.
P.O. Box 828
Springfield, MO 55395

### 31-02 Scraped Surface Heat Exchangers

290 APV Americas - Lake Mills
100 South CP Ave.
Lake Mills, WI 53551

323 Waukesha Cherry-Burrell
Process Equipment Division
P.O. Box 35600
Louisville, KY 40232-5600

274 Alfa Laval Thermal, Inc.
111 Parker St.
Newburyport, MA 01950

496 FMC Corp.
Fran Rica Systems
P.O. Box 30127
Stockton, CA 95213-0127

361 Terlet N.V.
P.O. Box 62
7200 AB Zutphen
Netherlands
(US Agent Manning & Lewis-NJ)

964 Schroder Gmbh & Co. KG
Falkenstr. 51-57
D-23564, Lubeck
Germany
(US Rep.: Schroder N.A. Corp.
12780 Westlinks Drive
Fort Myers, FL 33913)

### 32-02 Uninsulated Tanks for Milk and Milk Products

397 APV Americas – Lake Mills
100 South CP Ave.
Lake Mills, WI 53551

268 DCI, Inc.
600 No. 54th Ave., P.O. Box 1227
St. Cloud, MN 56301

708 Lee Industries, Inc.
P.O. Box 688
Phillipsburg, PA 16866

844 Paul Mueller Co.
1600 West Phelps St.
Springfield, Missouri 65801

354 C.E. Rogers Co.
1895 Frontage Road P.O. Box 118
Mora, MN 55051

683 SANIFAB
A Division of A&B Process Systems Corp.
P.O. Box 86
Stratford, WI 54484

441 Scherping Systems
801 Kingsley St.
Winsted, MN 55395

852 Viatec, Inc.
1220 State St.
Hastings, MI 49058

339 Walker Stainless Equip. Co., Inc.
625 State St.
New Lisbon, WI 53950

### 33-01 Polished Metal Tubing for Dairy Products

310 Allegheny Bradford Corp.
P.O. Box 200 Route 219 South
Bradford, PA 16701

812 A.T.I. s.r.1.
Viale Resegone 7
22036 Erba (Como)
Italy
(US Rep.: Norca Corporation
185 Great Neck Road
Great Neck, NY 11022)

413 Azco, Inc.
P.O. Box 567
Appleton, WI 54912

736 Kvalitetsproduktion AB
S-693 29 Degerfors, Sweden
(US Rep.: Flowtech, Inc.
1900 Lake Park Drive, Ste. 345
Smyrna, GA 30080)

308 Rath Manufacturing Co., Inc.
2505 Foster Ave.
Janesville, WI 53545

368 Rodger Industries Inc.
P.O. Box 186, R.R. 1
Blenheim, Ontario
Canada NOP 1A0

776 TGPRO
Bangkok, Thailand
(US Rep.: Kurt Orban Partners
Kurt Orban
450 Kings Road
Brisbane, CA 94005)

775 Trent Tube
P.O. Box 77
East Troy, WI 53120

331 United Industries, Inc.
1546 Henry Ave.
Beloit, WI 53511

### 34-02 Portable Bins

916 Custom Metalcraft, Inc.
2332 East Division
P.O. Box 10587 GS
Springfield, MO 65808

647 Thomas Conveyor Company
Tote System Division
P.O. Box 2916
Fort Worth, TX76113-2916

869 ADMIX, Inc.
234 Abby Road
Manchester, NH 03103-3332

527 Arde Barinco, Inc.
500 Walnut St.
Norwood, NJ 07648

590 Chemineer, Inc.
125 Flagship Drive
North Andover, MA 01845

417 Waukesha Cherry-Burrell
Process Equipment Division
P.O. Box 35600
Louisville, KY 40232-5600

825 GEI International, Inc.
700 Pennsylvania Drive
Exton, PA 19341

914 International Mixing Tech. S.a.r.l.
469Ave. Louis Herbeaux
F-59240 Dunkerque
France
(US Rep.: I.M.T. USA
6946 Paseo Laredo
San Diego, CA 92037)

642 Mondomix B.V.
Reeweg 13
P.O. Box 98
1394 ZH Nederhorst den Berg
The Netherlands
(US Rep.: Mondomix
1 West IL St., Suite 300
St. Charles, IL 60174

1027 Polar Process Inc.
P.O. Box 190
92 Albert St. E.
Plattsville, Ontario, Canada J0J IS0

680 Quadro Engineering, Inc.
613 Colby Drive
Waterloo, Ontario, Canada J2V 1A1
(US Rep.: Quadro, Inc.
55 Bleeker St.
Milburn, NJ 07041-1414)

766 Semi-Bulk
159 Cassens Court
Fenton, MO 63026-2543

724 Silverson Machines, Inc.
P.O. Box 589
355 Chestnut St.
E. Longmeadow, MA 01028

### 36-00 Colloid Mills

808 Boston Shearpump, Inc.
170 Linden St.
Wellesley, MA 02181-7919

846 IKA Works, Inc.
2635 North Chase Parkway, S.E.
Wilmington, NC 28405-7499

915 IKA Works, Inc.
2635 North Chase Parkway, S.E.
Wilmington, NC 28405-7499

608 Kinematica, Inc.
19 Normandy Road
Newton, MA 02166

293 Waukesha Cherry-Burrell
611Sugar Creek Road
Delavan, WI 53115

### 38-00 Cottage Cheese Vats

541 Kusel Equipment Co.
820West St.
Watertown, WI 53094

385 Stoelting, Inc.
502 Hwy 67
Kiel, WI 53042-1600

### 40-01 Bag Collectors for Dry Milk and Dry Milk Products

381 Marriott Walker Corp.
925 E. Maple Road
Birmingham, MI 48809

456 C.E. Rogers Co.
P.O. Box 118
Mora, MN 55051

### 41-01 Mechanical Conveyors

631 Flexicon Corp
1375 Strykers Road
Phillipsburg, NJ 08865

894 Spiroflow-Orthos Systems, Inc.
2806Gray Fox Road
Monroe, NC 28110

### 42-01 In-Line Strainers

855 Flowtech Inc.
1701 Spinks Drive S.E.
Marietta, GA 30067-8925

655 Tri-Clover, Inc.
P.O. Box 1413
Kenosha, WI 53141-1413

1023 Ultrafilter, Inc.
3560 Engineering Drive
Norcross, GA 30092

606 Waukesha Cherry-Burrell
611 Sugar Creek Road
Delavan, WI 53115

### 44-02 Air Hydraulically or Mechanically Driven Diaphragm Pumps

958 American LEWA, Inc.
132 Hopping Brook Road
Hollingston, MA 01746-1499

959 American LEWA, Inc.
132 Hopping Brook Road
Hollingston, MA 01746-1499

937 Versa-Matic Pump Co.
6017 Enterprise Drive
Export, PA 15632-8969

1012 Versa-Matic Pump Co.
6017 Enterprise Drive
Export, PA 15632-8969

713 Warren Rupp, Inc., A Unit of IDEXX Corp.
800 North Main St.
P.O. Box 1568
Mansfield, OH 44905

833 Wilden Pump & Engineering Com
22069 Van Buren St.
Grand Terrace, CA 92313-5651

805 Tri-Clover
P.O. Box 1413
Kenosha, WI 53141-1413

### 45-00 Cross Flow Membrane Modules

807 CeraMem Separations
20 Clematis Ave.
Waltham, MA 02154

786 North Carolina SRT, Inc.
221 James Jackson Ave.
Cary, NC 27513

### 46-01 Refractometers and Optical Sensors

981 AW Company
8809 Industrial Drive
Franksville, WI 53126-9337

785 Bran & Lubbe, Inc.
1025 Busch Parkway
Buffalo Grove, Il 60089

955 Brimrose Corp. of America
5020 Campbell Blvd.
Baltimore, MD 21236-4968

859 The Electron Machine Corp.
15820 CR 450 West
P.O. Box 2345
Umatilla, FL 32784

800 Epsilon Industrial Inc.
2215 Grand Ave. Parkway
Austin, TX 78728

783 James C. Camp
dba Advantec Process Systems
95 Wyngate Drive
Newnan, GA 30265

940 K-Patents OY
P.O. Box 77
Fin-01511
Vantaa, Finland
(US Rep.: K-Patents, Inc.
1804 Centre Pointe Circle, Suite 106
Naperville, IL 60563

697 Liquid Solids Control, Inc.
P.O. Box 259
Farm St.
Upton, MA 01568

751 Maselli Measurements, Inc.
Via Baganza, 43100
Parma, Italy
(US Rep.: Maselli Measurements, Inc.
P.O. Box 7571
Stockton, CA 95267

921 optek-Danulat Inc.
279 South 17th Ave., Suite 10
West Bend, WI 53095

767 Foss NIR Systems, Inc.
12101 Tech Road
Silver Spring, MD 20904

750 PT Papertech, Inc.
#301 - 2609 Westview Drive
North Vancouver
B. C. Canada V7N 4M2
(US Rep.: BD Services Corp.
300 North Commercial St.
Bellingham, WA 98227

919 Foss NIR Systems, Inc.
12101 Tech Road
Silver Spring, MD 20904

742 Reflectronics, Inc.
3009 Montavesta Road
Lexington, KY 40502

### 47-00 Pumps for Cleaning and Sanitizing Solutions

897 Ampco Pumps Co.
4000 West Burnham St.
Milwaukee, WI 53215

### 50-00 Level Sensing Devices

705 Bindicator Co.
1915 Dove St.
Port Huron, MI 48060

### 51-00 (Formerly 08-17R) Plug-Type Valves

787 Cipriani, Inc.
Tassalini S.P.A
23195 LaCadena Drive, Suite 103
Laguna Hills, CA 92653

772 Alfa Laval Flow, Inc.
G & H Division
8201 - 104th St., P.O. Box 581909
Pleasant Prairie, WI 53158-0909

780 L.C. Thomsen, Inc.
1303 - 43rd St.
Kenosha, WI 53140

239 LUMACO
9 - 11 East Broadway
Hackensack, NJ 07601

788 Puriti, S.A. De C.V.
Alfredo Nobel No. 39
Fracc. Inc. Pte. De Vigas
Tlalnepantha, MX
(US Rep.: Waukesha Cherry-Burrell
611 Sugar Creek Road
Delavan, WI 53115

781 Robert James Sales, Inc.
699 Hertel Ave., Suite 260
Buffalo, NY 14207

357 Tanaco Products
3860 Loomis Trail Road
Blaine, WA 98230

777 Tech Control Ent.
3725 N. Murray Road
Otis Orchard, WA 99027

790 Tri-Clover, Inc.
P.O. Box 1413
Kenosha, WI 53141-1413

759 VNE Corp.
1149 Barberry Drive
Janesville, WI 53545

761 Waukesha Cherry-Burrell
611 Sugar Creek Road
Delavan, WI 53115

**52-01 (Formerly 08-17H) Thermoplastic Plug Type Valves**

907 LAUFER International AG
Finkenweg 2
D-88709
Meersburg, Germany
(US Rep.: M. G. Newell Corporation
115 N. 20th St.
Tampa, FL 66305)

577 Ralet-Defay
66, Blvd. Poincare
1070 Brussels, Belgium
(US Agent GENICANAN, Chazy, NY)

**53-01 (Formerly 08-17A) Compression Type Valves**

484 APV Americas – Lake Mills
100 South CP Ave.
Lake Mills, WI 53551-1799

952 APV Fluid Handling-America
100 South CP Ave.
Lake Mills, WI 53551-1799

730 APV Americas – Lake Mills
100 South CP Ave.
Lake Mills, WI 53551-1799

552 APV Americas – Lake Mills
100 South CP Ave.
Lake Mills, WI 53551-1799

245 Babson Brothers Co.
Dairy System Division
P.O. Box 659
20903 West Gale Ave.
Galesville, WI 54630

443 Badger Meter, Inc.
6116 East 15th St.
Tulsa, OK 74112

686 Bardiani Valvole S.R.L.
Via G. Vittorio, 30/B
43045 Fornovo (PR) Italy
(US Rep.: Sanchelima Int.
1763 Northwest 93rd Ave.
Miami, FL 33172

1010 Candigra/CIA, S.A.
c/Telers, 54-Aptdo 174
17820 Banyoles, Spain
(Not available in the USA)

538 Cipriani, Inc.-Tassalina S.P.A.
23195 La Cadena Dr., Suite 103
Laguna Hills, CA 92653

716 Conexiones Inoxidables
de Puebla S.A.de C.V.
Vincente Guerrero No. 211
Xicotepec de Juarez
Edo, Puebla Mexico
(US Rep.: Ben Dolphin Consulting
4735 Lansing Drive
North Olmsted, OH 44070)

376 Defontaine of America, Inc.
16720 W. Victor Road
New Berlin, WI 53151

530 Alfa Laval Flow, Inc.
G & H Division
8201 - 104th St., P.O. Box 581909
Pleasant Prairie, WI 53158-0909

607 FLOWSERVE Corporation
510 Parkway View Dr.
Pittsburgh, PA 15205-1410

570 LUMACO
9-11 East Broadway
Hackensack, NJ 07601

881 MTX Milchtechnik AG
Saint Galler Strasse 19
SH-9042
Speicher AR
Switzerland
(US Rep.: Mr. James Lucas
Lucas & Associates
642 Alvarado St., #306
San Francisco, CA 94114)

483 On-Line Instrumentation, Inc.
Rt. 376, P.O. Box 541
Hopewell Junction, NY 12533

652 Pierre Guerin SA
BP.12-79210
Mauze-Sur-Le-Mignon
France
(Not available in the USA)

551 Puriti, S.A. de C.V.
Alfredo Nobel 39
Fracc. Inc. Puente de Vigas
Tlalnepantla, Mexico
(US Rep.: Waukesha Cherry-Burrell
611 Sugar Creek Rd.
Delavan, WI 53115)

149R Q-Controls
Subsidiary of Cesco Magnetics
93 Utility Court
Rohnert Park, CA 94928

978 Relco Unisystems Corp.
2281 - 3rd Ave. S.W., P.O. Box 1689
Willmar, MN 56201

748 Richards Industries Valve Group
3170 Wasson Road
Cincinnati, OH 45209-2381

944 Samson Controls, Inc.
4111 Cedar Blvd.
Baytown, TX 77520

762 Stainless Products, Inc.
1649 - 72nd Ave.
Somers, WI 53171-0169

806 Steri Technologies, Inc.
857 Lincoln Ave.
Bohemia, NY 11716

804 Sudmo North America, Inc.
6918 Forest Hills Road
Rockford, IL 61111

823 Sudmo North America, Inc.
6918 Forest Hills Road
Rockford, IL 61111

954 Taylor Valve Technology
8300 S.W. 8th St.
Oklahoma City, OK 73128

542 L.C. Thomsen, Inc.
1303 - 43rd St.
Kenosha, WI 53140

34A Tri-Clover, Inc.
P.O. Box 1413
Kenosha, WI 53141-1413

467 Tuchenhagen North America, Inc.
9165 Rumsey Road
Columbia, MD 21045

1008 UNIVALVE S.A.
Z.A. du Mittelfeld 1,
rue Alfred Kastler
F67300 Schiltigheim, France
(Not available in the USA)

561 VACU-PURG, Inc.
214 West Main St.
P.O. Box 159
Fredericksburg, IA 50630

584 Valvinox, Inc.-SGRM Division
650 lere Rue.
Iberville-QUE-Canada J2X 3B8

796 VNE Corp.
1149 Barberry Drive
Janesville, WI 53547

555 Waukesha Cherry-Burrell
611 Sugar Creek Road
Delavan, WI 53115

### 54-02 (Formerly 08-17B) Diaphragm-Type Valves

565 APV Americas - Lake Mills
100 South CP Ave.
Lake Mills, WI 53551-1799

877 APV Americas - Lake Mills
100 South CP Ave.
Lake Mills, WI 53551-1799

980 APV Americas - Lake Mills
100 South CP Ave.
Lake Mills, WI 53551-1799

615 AsepCo
1101 San Antonio Road, #301
Mountain View, CA 94043

814 Burkert Contromatic Corp.
2602 McGaw Ave.
Irvine, CA 92714

953 Burkert Contromatic Corp.
2602 McGaw Ave.
Irvine, CA 92714

745 Cashco, Inc.
P.O. Box 6, Hwy. 140 West
Ellsworth, KS 67439-006

617 Defontaine of America, Inc.
16720 W. Victor Road
New Berlin, WI 53151

856 Flowtech, Inc.
1900 Lake Park Drive, #345
Smyrna, GA 30080

637 Gemu Valves, Inc.
3800 Camp Creek Parkway
Bldg 2600, Suite 110
Atlanta, GA 30331

514 H.D. Bauman Inc.
35 Mirona Road
Portsmouth, NH 03801-5317

203R ITT Engineered Valves
33 Centerville Road
Lancaster, PA 17603-2064

494 Tri Clover Inc.
Division of Alfa Laval
P.O. Box 1413
Kenosha, WI 53141-1413

### 55-01 Boot Seal Valves for Milk & Milk Products

821 Keofitt A/S
Snaremosvej 27
KDK-7000 Fredericia
Denmark
(SU Rep.: Keofitt, Inc.
c/o Leman
2920-3000 Wolff St.
Racine, WI 53404)

### 56-00 (Formerly 08-17E) Inlet and Outlet Leak-Protector Plug Valve

34E Tri-Clover, Inc.
P.O. Box 1413
Kenosha, WI 53141-1413

### 57-01 Formerly 08-17F) Tank Outlet Valve

531 Alfa Laval Flow, Inc.
G & H Division
8201 - 104th St., P.O. Box 581909
Pleasant Prairie, WI 53158-0909

534 Lumaco
9-11 East Broadway
Hackensack, NJ 07601

643 Paul Mueller Co.
1600 West Phelps
Springfield, MO 65801

### 58-00 (Formerly 08-17M) Vacuum Breakers and Check Valves

843 APV Americas-Lake Mills
100 South CP Ave.
Lake Mills, WI 53551

986 CME
No. 21, Alley 6, Lane 71
Lin-Sen Rd.
Taoyuan, Taiwan
(US Rep.: Bradford Cast Metals
P.O. Box 33
Elm Grove, WI 53122)

691 Defontaine of America, Inc.
16720 W. Victor Road
New Berlin, WI 53151

835 Alfa Laval Flow, Inc.
G & H Division
P.O. Box 1413
Kenosha, WI 53141-1413

1014 Check-All Valve Manufacturing Co.
1800 Fuller Road
Des Moines, IA 50265

968 SINMAG FITTING CORP.
6F, No. 23, Wu-Chuang 6th Road
Wu-Ku Hsiang
Taipei Hsien, Taiwan
(US Rep.: MarketNet
2241 Quebec Ave. S.
St. Louis Park, MN 55426

834 Stanfos, Inc.
3908 - 69th Ave.
Edmonton, Alberta
Canada T6B 2V2
(US Rep.: Andron Stainless Corporation
8901 Farrow Road, Suite 101
Columbia, SC 29203)

857 Steel 7 O'Brien, Mfg. Co.
12850, Route 39
Sardina, NY 14134

689 VNE Corporation
1149Barberry Drive
Janesville, WI 53547

908 Waukesha Cherry-Burrell
611 Sugar Creek Road
Delavan, WI 53115

### 59-00 (Formerly 08-17D) Automatic Positive Displacement Sampler

291 Accurate Metering Systems Inc.
1650 Wilkening Court
Schaumburg, IL 60173

284 Bristol Equipment Co.
210 Beaver St.
P.O. Box 696
Yorkville, IL 60560-0696

### 60-00 (Formerly 08-17G) Rupture Discs

407 Continental Disc Corp.
3160 W. Heartland Drive
Liberty, MO 64068

854 Fike Metal Prod.
Div. Fike Corp.
704 South 10th St.
Blue Springs, MO 64015

892 Oklahoma Safety Equipment Company (OSECO)
1701 West Tacoma
Broken Arrow, OK 74012

### 61-00 (Formerly 08-171) Steam Injected Heaters

728 APV Americas
Heat Transfer Division
395 Fillmore Ave.
Tonawanda, NY 14150

811 Hydro-Thermal Corporation
400 Pilot Court
Waukesha, WI 53188

991 Komax Systems, Inc.
508 East E St.
Wilmington, CA 90744

560 Pick Heaters, Inc.
P.O. Box 516
West Bend, WI 53095

874 Q-Jet DSI, Inc.
704 Powell Lane, P.O. Box 350
Lewiston, NY 14092-0350

### 62-01 (Formerly 08-17L) Hose Assemblies

795 Able Hose & Rubber, Inc.
2307 E. Hennepin Ave.
Minneapolis, MN 55413

774 The Briggs Co.
3 Bellecor Drive
New Castle, DE 19720

758 Crouch Supply Co.
P.O. Box 16389
902 S. Jennings
Ft. Worth, TX 76161

721 Dixon Valve & Coupling Co.
800 High St.
Chestertown, MD 21620-1196

913 JGB Enterprises, Inc.
115 Metropolitan Drive
Liverpool, NY 13088

757 Nelson-Jameson, Inc.
P.O. Box 647
2400 East 5th St.
Marshfield, WI 54449

727 Nalge Process Technologies Group
924 Marcon Blvd.
Allentown, PA 18103

799 R/W Connection
936 Links Ave.
Landisville, PA 17538

698 Sanitary Couplers, Inc.
275 South Pioneer Blvd.
Springsboro, OH 45066

700 Titan Industries, Inc.
P.O. Box 1007
11121 Garfield Ave.
South Gate, CA 90280-7590

### 63-02 (Formerly 08-17R) Sanitary Fittings

1018 Advance Fittings Corporation
218 West Centralia St.
Elkhorn, WI 53121

380 Allegheny Bradford Corp.
P.O. Box 200 Route 219 South
Bradford, PA 16701

79R APV Americas – Lake Mills
100 South CP Ave.
Lake Mills, WI 53551-1799

682 Andron Stainless, Ltd.
6170 Tomken Road
Mississauga, Ontario
Canada L5T 1X7
(US Rep.: Andron Stainless Corp.
8901 Farrow Road, #101
Columbia, SC 29223)

349 APN, Inc.
921 Industry Road
Caledonia, MN 55921

900 APV Americas – Lake Mills
100 South CP Ave.
Lake Mills, WI 53551-1799

948 ARMATURENWERK
HOTENSLEBEN GmbH
SchulstraBe 5-6
39393 Holenslebon
Germany
(US Rep.: VNE Corporation
1149 Barberry Drive
Janesville, WI 53547)

1016 Becker, Inc.
P.O. Box 1258
6705 14th Ave.
Kenosha, WI 53140

621 Bradford Castmetals
P.O.Box 33
Elm Grove, WI 53122

688 Swagelok
29500 Solon Road
Solon, OH 44139-3492

985 CME
No. 21, Alley 6, Lane 71
Lin-Sen Road
Taoyuan, Taiwan
(US Rep.: Bradford Cast Metals
P.O. Box 33
Elm Grove, WI 53122)

960 C S E Chiang Sung
Enterprise Co., Ltd.
No. 65 Sheng Kung 1st Road
Pei Tou Industrial Park
Changhua, Taiwan ROC
(US Rep.: Kurt Orban Partners
450 Kings Road
Brisbane, CA 94005)

949 CANDIGRA y CIA, S.A.
C/. Telers, 54-Aptdo. 174
17820 Banyoles
Spain
(Not Available in the USA)

645 Cipriani, Inc. - Tassalini S.P.A.
23195 La Cadena Drive, Suite #103
Laguna Hills, CA 92653

962 CIVACON
416 E. Alondra Blvd.
Gardena, CA 90248

696 Conexiones Inoxidables
de Puebla S. A. de C. V.
Vicente Guerrero No. 112
Xicotepec de Juarez
Edo. Puebla, Mexico
(US Rep.: Ben Dolphin Consulting
4735 Lansing Drive
North Olmsted, OH 44070)

1003 Dixson Valve and Coupling Company
800 High St.
Chestertown, MD 21620-1196

677 EXCEL-A-TEC, Inc.
N93 W14635 Whittaker Way
Menomonee Falls, WI 53051

973 Fastest, Inc.
2315 Hampden Ave.
St. Paul, MN 55114

947 FLOWMECA
47 rue du Bois Chaland
LISSES
91029 Evry Cedex
France
(US Rep.: FLOWMECA, Inc.
19400 Stevens Creek Blvd., Suite 200
Cupertino, CA 95014)

838 Food & Dairy Quality Mgmt. Inc. (QMI)
245 E. 6th St., Suite 416
St. Paul, MN 55101

67R Alfa Laval Flow, Inc.
G & H Division
8201 - 104th St., P.O. Box 581909
Pleasant Prairie, WI 53158-0909

925 Hassia Verpackungsmachinen
GmbH
Heerweg 19
D-63691
Ranstadt, Germany
(US Rep.: Hassia USA, Inc.
1210 Campus Drive West
Morganville, NJ 07751)

773 Herrli AG
3210 Kerzers
Switzerland
(US Rep.: VNE Corp.
P.O. Box 1698
Janesville, WI 53547)

917 Irving Polishing & Mfg., Co., Inc.
5704 46th St.
Kenosha, WI 53144-1899

454 Jensen Fittings Corp.
107-111 Goundry St.
North Tonawanda, NY 14120-5998

933 King Lai International Co., Ltd.
No. 10, The 6th St.
Youth Industrial Zone
Tachia, Taichung
Taiwan ROC
(Not Available in the USA)

389 Lee Industries, Inc.
P.O. Box 688
Philipsburg, PA 16866

703 Parker Hannifin Corp.
UHP Products Division
1005 A Cleaner Way
Huntsville, AL 35805

200R Paul Mueller Co.
1600 W. Phelps St., Box 828
Springfield, MO 65801

726 Nalge Process Technologies Group
924 Marcon Blvd.
Allentown, PA 18103

242 Puriti, S.A.de C.V.
Alfredo Nobel 39
Industrial Puente de Vigas
Tlalnepantla, Mexico
(US Rep.: Waukesha Cherry-Burrell
611 Sugar Creek Road
Delavan, WI 53115)

424 Robert-James Sales, Inc.
699 Hertel Ave., Suite 260
Buffalo, NY 14207

699 Rodger Industries, Inc.
P.O. Box 186
Blenheim, Ontario
Canada N0P 1A0

1007 Rotary Systems Inc.
1036 McKinley St.
Anoka, MN 55303

969 SINMAG FITTING CORP.
6F, No. 23, Wu-Chuang 6th Road
Wu-Ku Hsiang
Taipei Hsein, Taiwan
(US Rep.: MarketNet
2241 Quebec Ave. S.
St. Louis Park, MN 55426)

334 Stainless Products, Inc.
1649-72nd Ave., Box 169
Somers, WI 53171

741 Steel & O'Brien Mfg., Inc.
12850 Rt 39
Sardinia, NY 14134

391 Stork Food & Dairy Systems, Inc.
P.O. Box 1258
1024 Airport Parkway
Gainesville, GA 30503

449 Tech Controls Enterprise Co., Ltd.
3725 N. Murray Road
Otis Orchard, WA 99027

73R L.C. Thomsen, Inc.
1303-43rd St.
Kenosha, WI 53140

34R Tri-Clover, Inc.
P.O. Box 1413
Kenosha, WI 53141-1413

987 Trident Stainless Manufacturing Ltd.
4635 Burgoyne St., Units 17-18
Mississuaga, Ontario
Canada L4W 1V9
(US Rep.: Steve Byskosh
500 Berwick Court
Schaumburg, IL 60193)

1017 United Pacific Distributors Supply, Inc.
1040 Wallace Place
City of Industry, CA 91748

707 Valvinox, Inc., SG RM Div.
650-1st St.
Iberville, Quebec, Canada J2X 3B8

304 VNE Corp.
1149 Barberry Drive
Janesville, WI 53547

82R Waukesha Cherry-Burrell
611 Sugar Creek Road
Delavan, WI 53115

1006 Westfalia Landtechnik of Australia Pty. Ltd.
4 Saligna Drive
Tullamarine, Victoria
Australia 3043
(US Rep.: Westfalia Dairy Systems, Inc.
1862 Brummel Drive
Elk Grove, IL 60007

**64-00 (Formerly 08-17N) Pressure Reducing and Back Pressure Regulating Valve**

782 CASHCO, Inc.
P.O. Box 6
Ellsworth, KS 67439-0006

753 Alfa Laval Flow, Inc.
G & H Division
8201 - 104th St., Box 581909
Pleasant Prairie, WI 53158-0909

769 Richards Industries Valve Group
3170 Wasson Road
Cincinnati, OH 45209-2381

### 65-00 Sight &/or Light Windows & Sight Indications and Back Pressure Regulating Valve

849 Jacoby TarBox Division of Clark Reliance Corp.
16633 Foltz Industrial Parkway
Strongsville, OH 44136

867 J.M. Canty, Inc.
6100 Donne Road
Lockport, NY 14096

929 Darrell A. Beer
d.b.a. SHAE Industries
P.O. Box 1268
121 W. North St.
Healdsburg, CA 95448

845 L.J. Star Inc.
P.O. Box 1116
2201 Pinnacle Parkway
Twinsburg, OH 44807

890 Moisture Systems
117 South St.
Hopkinton, MA 01748

970 SINMAG FITTING CORP.
6F, No. 23, Wu-Chuang 6th Road
Wu-Ku Hsiang
Taipei Hsien, Taiwan
(US Rep.: MarketNet
2241 Quebec Ave. S.
St. Louis Park, MN 55426)

974 Steel & O'Brien Mfg., Inc.
12850 Rt 39
Sardinia, NY 14134

818 Tri-Clover, Inc.
P.O. Box 1413
Kenosha, WI 53141-1413

### 68-00 Ball-Type Valves

1032 Bowlswitch USA, Inc.
6580 Valley Center Drive
Radford, VA 24141

1022 Bradford Castmetals, Inc.
P.O. Box 33
Elm Grove, WI 53122

898 Fluid Transfer
Division of Lee Ind., Inc.
514 W. Pine St.
Philipsburg, PA 16866

931 LUMACO
9-11 East Broadway
Hackensack, NJ 07601

### 73-00 Shear Mixers, Mixers and Agitators

901 Admix, Inc.
234 Abby Road
Manchester, NH 03103-3332

957 Admix, Inc.
234 Abby Road
Manchester, NH 03103-3332

### 74-00 Sensors and Sensor Fittings and Connections

32 ABB Instrumentation, Inc.
125 E. County Line Road
Warminster, PA 18974

738 ABB Instrumentation, Inc.
125 E. County Line Road
Warminster, PA 18974

747 Alloy Engineering Co., Inc.
304 Seaview Ave.
Bridgport, CT 06607

576 Ametek Test and Calibration
Instruments Division
8600 Somerset Drive
Largo, FL 34643

822 Ametek Test and Calibration
PMT Products
820 Pennsylvania Blvd.
Feasterville, PA 19053

318 Anderson Instrument Co., Inc.
156 Auriesville Road
Fultonville, NY 12072

428 ARI Industries, Inc.
381 ARI Court
Addison, IL 60101

659 Bindicator Co.
1915 Dove St.
Port Huron, MI 48060

706 Bindicator Co.
1915 Dove St.
Port Huron, MI 48060

926 BOURDON - SEDEME S.A.
125, rue de la Marre
B.Pb 214 41103
Vendome Cedex
France
(US Rep.: Rawson & Co., Inc.
P.O. Box 924288
Houston, TX 77292-4288

872 Brookfield Eng. Lab, Inc.
11 Commerce Blvd.
Middleboro, MA 02346

359 Brooks Instrument Division
407 W. Vine St.
Hatfield, PA 19440

315 Burns Engineering, Inc.
10201 Bren Road, East
Minnetonka, MN 55343

525 Caldwell Systems Corp.
600 S. Sunset, Unit D
Longmont, CO 80501

910 CEMCO Mfg., Inc.
1120 North Peoria
Tulsa, OK 74106-4904

850 Chicago Stainless Equip.
1280 S.W. 34th St.
Palm City, FL 34990-3308

672 Computer Instruments Corp.
1000 Shames Drive
Westbury, NY 11590

829 DCT Instruments/Sensotec, Inc.
2080 Arlingatte Lane
Columbus, OH 43228-4112

862 Delta Controls Corp.
585 Fortson St.
Shreveport, LA 71107

586 Diversey Lever Equipment
151 Harvey W. Blvd.
Santa Cruz, CA 95060

866 Dovex S.S., Inc.
770 Tower Drive
Medina, MN 55340

640 Dresser Industries
Instruments Division
250 E. Main St.
Stratford, CT 06497

663 Dresser Industries
Instruments Division
210 Old Gate Lane
Milford, CT 06460

405 Drexelbrook Engineering Co.
205 Keith Valley Road
Horsham, PA 19044

861 Dwyer Instruments, Inc.
P.O. Box 373
Michigan City, IN 46360

977 Efector, Inc.
A subsidiary of ifm electronic
805 Springdale Drive
Exton, PA 19341

763 EG & G Berthold Laboritorium Prof.
Berthold GmbH & Co. KGCalmbacher Str. 22
D-7547 Bad Wildbad 1, Germany
(US Rep.: EG & G Berthold USA
100 Midland Road
Oak Ridge, TN 37830)

936 ENFM-USA, Inc.
11339 E. Distribution Ave.
Jacksonville, FL 32256

1028 Finn and Co., Inc.
7524 W. 98th Place
Bridgeview, IL 60455

1033 Finn and Co., Inc.
7524 W. 98th Place
Bridgeview, IL 60455

524 Flow Technology, Inc.
4250 E. Broadway Road
Phoenix, AZ 85040

459 Endress + Hauser, Inc.
2350 Endress Place
Greenwood, IN 46142

876 Fisher-Rosemount Singapore
Private Limited
1 Pandan Cresent
Singapore 0512
Republic of Singapore
(US Rep.: Rosemount, Inc.
12001 Technology Drive
Eden Prairie, MN 55344)

598 FMC Invalco, Inc.
A FMC Corp. Subsidiary
2825 W. Washington
Stephenville, TX 76401

206 The Foxboro Co.
33 Commercial St.
Foxboro, MA 02035

963 GLI International, Inc.
9020 W. Dean Road
Milwaukee, WI 53224

984 Garner Industries
4200 North 48th St.
Lincoln, NE 68504

592 Claud S. Gordon Co.
5710 Kenosha St.
P.O. Box 500
Richmond, IL 60071

668 GP: 50 New York, Ltd.
2770 Long Road
P.O. Box 1150
Grand Island, NY 14072

633 Griffith Industrial Products Co.
P.O. Box 111
Putnam, CT 06260

749 Haenni Cie & AG
ChH-3303
Jegenstorf, Switzerland
(US Rep.: Haenni Instruments, Inc.
1107 Wright Ave.
Gretna, LA 70056

651 HEINRICH KUBLER AG
CH-6341 Baar
Switzerland
(US Rep.: Granzow, Inc.
2300 Crown Point Executive Drive
Charlotte, NC 28227)

794 Honeywell, Inc.
1100 Virginia Drive
Fort Washington, PA 19034

557 Honeywell, Inc.
Industrial Controls Div.
1100 Virginia Drive
Fort Washington, PA 19034

832 H.O. Trerice Co.
12950 W. Eight Mile Road
Oak Park, MI 48237-3288

629 ISE-Magtech
907 Bay Star
Webster, TX 77598-1531

572 ITT Conoflow
P.O. Box 768, Route 78
St. George, SC 29477

961 KDG Instruments
Crompton Way
Crawley, W. Sussex
RH102YZ, England
(Not available in the USA)

798 Kay-Ray/Sensall, Inc.
1400 Business Center Drive
Mount Prospect, IL 60056

930 Kampstrup A/S
Process Division
Jacob Knudsens Vej 12
DK-8230 Aabyhoj
Denmark
(Not available in the USA)

945 Kemotron, Inc.
1090 Northchase Parkway, Suite 200 S.
Marietta, GA 30067

842 Klay Instruments B.V.
Nijverheidsweg 5
NL 7991 CZ Dwingeloo
The Netherlands
(Not available in the USA)

396 King Engineering Corp.
P.O. Box 1228
Ann Arbor, MI 48106

893 Kistler-Morse Corp.
19021-120th Ave. N.E.
Bothell, WA 98011-9511

285 K Systems Corp. (Tank Mate Division)
4391 Butterfield Road
Hillside, IL 60162

620 Larad Equipment
213 Airport Dr. Ext.
Hopedale, MA 01747

501 Lumenite Control Technology Inc.
2331 N. 17th Ave.
Franklin Park, IL 60131

596 Magnetrol International
5300 Belmont Road
Downers Grove, IL 60515

768 MTS Systems Corp.
Sensors Division
3001 Sheldon Drive
Cary, NC 27513

906 Mettler-Toledo Process
Analytical, Inc.
261 Ballardvale St.
Wilmington, MA 01887

627 Milltronics, Ltd.
P.O. Box 4225
Peterborough, Ontario
Canaca K9J 7B1
(US Rep.: Milltronics, Inc.
709 E. Stadium Drive
Arlington, TX 76011)

1002 Milltronics, Ltd.
Nikkelstrand 10
NL4832 AB Breda, The Netherlands
(US Rep.: Milltronics, Inc.
709 E. Stadium Drive
Arlington, TX 76011)

588 Minco Products, Inc.
7300 Commerce Lane
Minneaplois, MN 55432

863 Nelson-Jameson
2400 East 5th St., Box 647
Marshfield, WI 54449

597 NUOVA FIMA S.p.A
Via C. Battisti 59
28045 - INVORIO (N0) Italy
(US Rep.: MDI Industrial Sales Ltd.
9868 - 33rd Ave.
Alberta, Canada T6N 1C6)

966 ODEN Corp.
255 Great Arrow Ave.
Buffalo, NY 14207

909 OHMART/VEGA Corp.
4241 Allendorf Drive
Cincinnati, OH 45209-9961

983 OHMART/VEGA Corp.
4241 Allendorf Drive
Cincinnati, OH 45209-9961

523 Paper Machine Components, Inc.
Miry Brook Road
Danbury, CT 06810

554 Par Sonics, Inc.
R.D. #1 - Box 505
Centre Hall, PA 16828

563 PI Components Corp.
1951 Hwy 290 W
Brenham, TX 77833

644 Princo Instruments, Inc.
1020 Industrial Hwy.
Southampton, PA 18966-4095

815 ProMag PM LTD
11552 Merchant Drive
Baton Rouge, LA 70809

1000 Pro/M/tec., Inc.
1201 Braddock Ave., Suite 2
Pittsburgh, PA 15218

487 Pyromation, Incorporated
5211 Industrial Road
Fort Wayne, IN 46825-5152

367 RDF Corporation
23 Elm Ave.
Hudson, NH 03051

982 Reotemp Instrument Corporation
11568 Sorrento Valley Road, Suite 10
San Diego, CA 92121-1313

495 Rosemount Analytical, Inc.
Uniloc Division
2400 Barranca Parkway
Irvine, CA 92606

1013 Rheology Services, Inc.
160 Market St., Suite 7
Saddle Rock, NJ 07663

328 Rosemount, Inc.
12001 Technology Drive
Eden Prairie, MN 55344

732 SensorTec, Inc.
7620 DiSalle Blvd.
Fort Wayne, IN 46825

784 Sensotec, Inc.
2080 Arlington Lane
Columbus, OH 43228-4112

515 Setra Systems, Inc.
159 Swanson Road
Boxborough, MA 01719

583 S.J. Controls, Inc.
2248 Obispo Ave. #203
Long Beach, CA 90806

873 Smar Equipamentos
Industriasis Ltda.
7240 Brittmoore, Suite 118
Houston, TX 77041

875 SOR
14685 W. 105th St.
Lenexa, KS 66215-5964

420 Stork Food & Dairy Systems, Inc.
P.O. Box 1258
1024 Airport Parkway
Gainesville, GA 30503

896 TBI-Bailey Controls Company
2175 Lockheed Way
Carson City, NV 89706

641 Tempress A/S
Nordlandsvej 64-66
Dk-8240 Risskor, Denmark
(Not available in the USA)

690 Texas Thermowell, Inc.
P.O. Box 1535
Hwy. 96 North
Silsbee, TX 77656

765 Tri-Clover, Inc.
P.O. Box 1413
Kenosha, WI 53141-1413

444 Tuchenhagen North America, Inc.
9160 Red Branch Road
Columbia, MD 21045
196 Western Ave.
Fon du Lac, WI 54936-1458

754 Valmet Automation
30 Thomas Drive
Westbrook, MA 04092

410 Viatran Corp.
300 Industrial Drive
Grand Island, NY 14072

779 Wahl Instruments, Inc.
234 Weaverville Hwy.
Asheville, NC 28804

522 Weed Instrument Co., Inc.
707 Jeffrey Way
Round Rock, TX 78664

569 WEISS Instruments, Inc.
85 Bell St.
West Babylon, NY 11704
(Mfg. By: Nuova-Fima, Italy)

600 Weksler Instruments Corp.
250 E. Main St.
Stratford, CT 06497

646 WIKA Instrument Corp.
1000 Wiegand Blvd.
Lawrenceville, GA 30243

685 Winter's Thermogauges, Ltd.
121 Railside Road
Toronto, Ontario
Canada M3A 1B2
(US Rep.: Winter's Thermogauges, Inc.
6020/3 N. Bailey Ave.
Buffalo, NY 14226)

879 Zurich Industrial E
Comercio LTDA
R. Serra da Piedade, 183
Sao Paulo - SP - Brazil 03131-080
(Not available in the USA)


AUGUST 6-9, 2000

# annual meeting

ATLANTA

Join us in Atlanta, Georgia for the world's most comprehensive food safety conference. Over 1,200 of the foremost authorities from industry, academia and government from around the world will be attending the conference. The Annual Meeting is recognized as the leading source for the latest information on advances in protecting the world's food supply.

The Annual Meeting includes over 250 presentations including symposia, technical sessions, and posters. Learn the latest trends and developments in the industry including topics on Bioterrorism and Food Protection, Surveillance of Foodborne Disease in Latin America and the Caribbean, Dairy Plant HACCP, Safe Production of Sprouts from Seeds, HACCP-based Strategies for Seafoods and many other issues facing food safety professionals daily.

Network with industry professionals in the Exhibit Hall. Interact with more than 90 exhibitors displaying the latest products and services available to the food safety industry. View displays of laboratory equipment, testing materials, sanitation products, pest control and more!

Plan now to attend the world's leading food safety conference — the International Association for Food Protection Annual Meeting! Visit our Web site at www.foodprotection.org for the latest Annual Meeting information or contact the Association office at 800.369.6337; 515.276.3344; Fax: 515.276.8655; E-mail: info@foodprotection.org.

# International Association for Food Protection

## 87th Annual Meeting

6200 Aurora Avenue, Suite 200W
Des Moines, IA 50322-2863, USA
Phone: 800.369.6337 • 515.276.3344
Fax: 515.276.8655
E-mail: info@foodprotection.org
Web site: www.foodprotection.org

## August 6-9, 2000, Atlanta, Georgia

**IMPORTANT! Please read this information before completing your registration form.**

### Meeting Information

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

Registration includes:

- Technical Sessions
- Symposia
- Poster Presentations
- Ivan Parkin Lecture
- Exhibit Hall Admittance
- Cheese and Wine Reception
- Exhibit Hall Reception
- Awards Banquet
- Program and Abstract Book

### 4 Easy Ways to Register

To register, complete the Attendee Registration Form and submit it to the International Association for Food Protection by:

**Phone:** 800.369.6337; 515.276.3344

**Fax:** 515.276.8655

**Mail:** 6200 Aurora Avenue, Suite 200W, Des Moines, IA 50322-2863

**Web site:** www.foodprotection.org

**The early registration deadline is June 30, 2000.** After June 30, late registration fees are in effect. Registration materials may be picked up on site at the Hilton Atlanta and Towers.

### Refund/Cancellation Policy

Registration fees, less a $50 administration fee and any applicable bank charges, will be refunded for written cancellations received by July 14, 2000. No refunds will be made after July 14; however, the registration may be transferred to a colleague with written notification. Refunds will be processed after August 14, 2000. Additional tickets purchased are nonrefundable.

### Exhibit Hours

Sunday, August 6, 2000 — 8:00 p.m. – 10:00 p.m.

Monday, August 7, 2000 — 9:30 a.m. – 1:30 p.m.
3:00 p.m. – 6:30 p.m.

Tuesday, August 8, 2000 — 9:30 a.m. – 1:30 p.m.

### Hotel Information

For reservations, contact the hotel directly and identify yourself as an International Association for Food Protection Annual Meeting attendee to receive a special rate of $119 per night, single or double. Make your reservations as soon as possible; this special rate is available only until July 7, 2000.

Hilton Atlanta and Towers
255 Courtland Street, NE
Atlanta, Georgia 30303
404.659.2000

### Evening Events

**Sunday, August 6, 2000**

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

**Monday, August 7, 2000**

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

Monday Night Social **Fernbank Museum of Natural History** (6:00 p.m. – 9:30 p.m.)

**Tuesday, August 8, 2000**

Dinner at Stately Oaks (5:30 p.m. – 10:30 p.m.)

**Wednesday, August 9, 2000**

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

### Daytime Tours

**Sunday, August 6, 2000**

Pop Topics (9:00 a.m. – 2:00 p.m.)

**Monday, August 7, 2000**

Peach Buzz (9:00 a.m. – 2:00 p.m.)

**Tuesday, August 8, 2000**

Diaries of the South (9:30 a.m. – 2:30 p.m.)

*Lunch included in all daytime tours*

### Golf Tournament

**Sunday, August 6, 2000**

Golf Tournament (6:00 a.m. – 2:00 p.m.)

# International Association for Food Protection
## 87th Annual Meeting

6200 Aurora Avenue, Suite 200W
Des Moines, IA 50322-2863, USA
Phone: 800.369.6337 • 515.276.3344
Fax: 515.276.8655
E-mail: info@foodprotection.org
Web site: www.foodprotection.org

## Attendee Registration Form
### August 6-9, 2000, Atlanta, Georgia

Name (Print or type your name as you wish it to appear on name badge)

Title Employer

Mailing Address (Please specify: ❒ Home ❒ Work)

City State/Province Country Postal/Zip Code

Telephone Fax E-mail

First time attending meeting ❒ Member since: _____

❒ Regarding the ADA, please attach a brief description of special requirements you may have.

**REGISTER BY JUNE 30, 2000 TO AVOID LATE REGISTRATION FEES**

| REGISTRATION FEES: | MEMBERS | NONMEMBERS | TOTAL |
|---|---|---|---|
| Registration (Awards Banquet included) | $ 260 ($310 late) | $395 ($445 late) | |
| Association Student Member* | $ 45 ($ 55 late) | Not Available | |
| Retired Association Member* | $ 45 ($ 55 late) | Not Available | |
| One Day Registration: ❒ Mon. ❒ Tues. ❒ Wed. | $ 145 ($170 late) | $200 ($225 late) | |
| Spouse/Companion (Name): _____ | $ 40 ($ 40 late) | $ 40 ($ 40 late) | |
| Children 15 & Over (Names): _____ | $ 25 ($ 25 late) | $ 25 ($ 25 late) | |
| Children 14 & Under (Names): _____ | FREE | FREE | |
| *Awards Banquet not included | | | |
| **EVENTS:** | | # OF TICKETS | |
| Golf Tournament (Sunday, 8/6) | $ 90 ($105 late) | | |
| Student Luncheon (Sunday, 8/6) | $ 5 ($ 10 late) | | |
| Monday Night Social, Fernbank Museum (Monday, 8/7) | $ 39 ($ 44 late) | | |
| Children 14 and under | $ 34 ($ 39 late) | | |
| Dinner at Stately Oaks (Tuesday, 8/8) (Limited tickets available) | $ 60 ($ 65 late) | | |
| Awards Banquet (Wednesday, 8/9) | $ 40 ($ 45 late) | | |
| **DAYTIME TOURS:** | | | |
| Pop Topics (Sunday, 8/6) | $ 56 ($ 61 late) | | |
| Peach Buzz (Monday, 8/7) | $ 53 ($ 58 late) | | |
| Diaries of the South (Tuesday, 8/8) (Lunch included in all tours) | $ 65 ($ 70 late) | | |

**TOTAL AMOUNT ENCLOSED $** _____

US FUNDS on US BANK

**Payment Options:**

❒ Check Enclosed ❒ VISA ❒ MasterCard ❒

Name on Card _____ Exp. Date _____

Signature _____

**JOIN TODAY AND SAVE!!!**
(Attach a completed Membership application)
(See page 176 of this issue for a membership application)

***EXHIBITORS DO NOT USE THIS FORM***

# Third Annual Foundation Fund Silent Auction Donate Today!

**The Third Annual Foundation Fund Silent Auction** will be held at the 87th Annual Meeting in Atlanta, Georgia, August 6-9, 2000.

### Why donate an item to the auction?

Last year's auction raised over $2,000 for the Foundation Fund. Promote your state or organization by donating items now to help the Foundation exceed its goal of 10,000 in 2000. The Foundation benefits the International Association of Food Protection Developing Scientist Competitive Grants, Audiovisual Library, and co-sponsorship of the Harry Haines Award. It also provides support for FP and Dairy Food and Environmental Sanitation Journals to developing countries.

### Be part of the excitement

Items donated last year include Country Breakfast Kits, Framed Prints, Handmade Quilt, Pearl Necklace, Waterford Crystal Millennium Goblets, and Wine. Donations are accepted from individuals, companies, and groups.

### Here's how it works

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

**Notification of donated items must be received by June 15, 2000 to be listed in the Program and Abstract Book.**

First Name _____ M.I. _____ Last Name _____

Job Title _____ Company _____

Mailing Address _____

(Please specify: ❒ Home ❒ Work)

City _____ State or Province _____

Postal Code/Zip + 4 _____ Country _____

Telephone # _____ Fax # _____

E-mail _____

Description of auction items:

_____

_____

**Return to:**
Frank Zuehlke
International Association for Food Protection
6200 Aurora Avenue, Suite 200W
Des Moines, IA 50322-2863, USA
Fax: 515.276.8655
E-mail: fzuehlke@foodprotection.org

seward

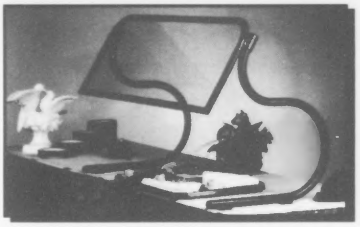
Delivering the Promise

Announeing a new "**Innovations in Food Microbiology Award**" for University Departments working on development of new teehnologies or methodologies for use in mierobiologieal safety and quality of food. For more information, eontaet:

Ms. E. Hill
Seward Ltd.
98 Great North Road
London N2 0GN
United Kingdom
E-mail: info@seward.co.uk

**Application deadline is February 29, 2000.**
This new Award will be presented August 9, 2000 at the 87th Annual Meeting in Atlanta, Georgia.

## TEMPORARY SET-UPS NEED SNEEZEGUARDS TOO!



At ***Sneezeguard Solutions*** we have systems that handle virtually any sneezeguard need.

Situations where sneezeguards are necessary but often overlooked and not used include:

- *Banquet Buffets*
- *Continental Breakfasts*
- *Happy Hour, Sunday Brunch and Lunch Buffets*
- *Public Trade Shows and Sample Give-Away Stations at Grocery Stores and Wholesale Clubs.*

We feature ***Folding Portable Sneezeguard Systems***, ***Transport and Storage Accessories***, and ***Stationary Sneezeguard Systems*** (permanently mounted).

Facilities that routinely offer temporary buffets ***SHOULD*** have the proper equipment on property to adequately protect their self-service food offerings.

For consultation, comments or literature, please call our toll-free line.

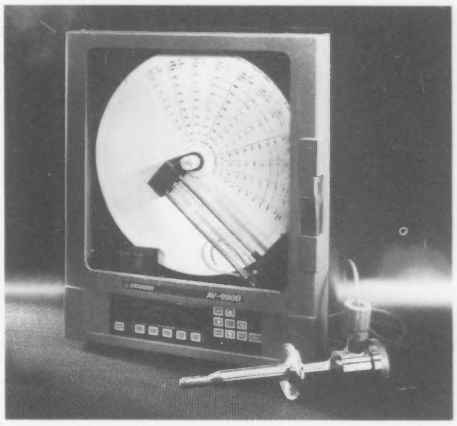
SNEEZEGUARD SOLUTIONS
THE SOLUTION SPECIALISTS

**800-569-2056**

**Reader Service No. 122**

ANDERSON

# NEW! AV-9900 HTST RECORDER CONTROLLER



Finally, a single unit designed to meet YOUR requirements and those of the PMO! The AV-9900 combines programmable, "print your own chart" technology, with failsafe protection for your HTST process.

- Four color printing of trends, scales, events, and alphanumeric messages.
- 12", Plain paper charts for a permanent record with maximum resolution.
- Multi-divert STLR plus hot water, cold product, and flow rate in a single unit.

To find out more about this revolutionary new product call your local Anderson distributor or contact us directly at 1-800-833-0081.

ANDERSON

***ANDERSON INSTRUMENT CO., INC.***
156 Auriesville Road
Fultonville, NY 12072 USA
1-800-833-0081 • FAX 518-922-8997

Maida International
516-676-3079 • FAX 516-676-3199
**www.andinst.com**

**Reader Service No. 135**

# BusinessExchange

Services/Products





## ADVERTISING INDEX

# ComingEvents

## MARCH

·**3, Baking Industry Sanitation Standards Committee (BISSC) 2000 Annual Membership Meeting,** at the Chicago Marriott Hotel, Chicago. For more information, contact Bonnie Sweetman, Executive Director, BISSC, 1400 W. Devon Ave., Suite 422, Chicago, IL 60660; Phone: 773.761.4100; Fax: 773.274.3242; E-mail: bakesan@aol.com.

·**7-8, Basic Food Microbiology Seminar,** Holiday Inn – Portland Airport, Portland, OR. Designed for those who work with food processing, preparation, or sanitation, but have a limited background in microbiology. For additional information, contact Jack Brook, Science Division, Mt. Hood Community College, 26000 SE Stark St., Gresham, OR 97030; Phone: 503.491.7473; E-mail: brookj@mhcc.cc.or.us.

·**7-10, 25th International Food and Beverage Exhibition,** at the Nippon Convention Center (Makuhari Meese), Japan. For further information, contact The Secretariat of FOODEX JAPAN; Phone: 81.3.3434.8116; Fax: 81.3.3434.8076; or Web site: www.jma.or.jp/FOODEX/.

·**9-11, International Fresh-cut Produce Association's 13th Annual Conference and Exhibition, "Dallas 2000: the Future is Now,"** Dallas, TX. This conference will provide fresh-cut processors, their suppliers, and their customers with an in-depth understanding of internal and external factors that will change the industry as it enters the twenty-first century. For more information, call Sherry Greenwood at 703.299.6282.

·**15, Dairy HACCP Workshop,** Madison, WI. This one-day workshop will cover design and implementation of HACCP plans in dairy plants. For additional information, contact Marianne Smukowski at 608.265.6346.

·**15-16, Carolinas Association of Milk, Food and Environmental Sanitarians.** For additional information, contact Joe Neely, SCDHEC Division of Environmental Health, 2600 Bull St., Columbia, SC 29201; Phone: 803.935.7890.

·**20-22, Principles of Quality Assurance Seminar,** Manhattan, KS. This seminar will review basic HACCP principles to help you understand the concepts and their practical uses. The hands-on workshop assists participants in developing a HACCP program and reviewing its strenghts and weaknesses. For more information, contact AIB, 1213 Bakers Way, P.O. Box 3999, Manhattan, KS 66505-3999; Phone: 785.537.4750; Fax: 785.537.1493.

·**21-23, 2nd Annual Food Safety Summit Conference,** Washington, D.C. Sponsored by The National Food Processors Association. The program focuses on real-world food safety and QA strategies offering practical solutions. For additional information, contact Scott Stein, 800.746.9646, ext. 105; E-mail: sstein@eatonhall.com.

·**30, British Columbia Food Protection Association First Annual Speaker's Evening** at the Executive Plaza in Coquitlam, British Columbia, Canada. For further information, contact Clive Kingsbury at 604.576.1911, ext. 3740.

## APRIL

·**3-4, Advanced HACCP Workshop,** Manhattan, KS. Participants will learn how to confirm prerequisite programs, review the HACCP manual, verify implemented HACCP systems, and validate the HACCP plan. For additional information, contact AIB, 1213 Bakers Way, PO Box 3399, Manhattan, KS 66505-3999 or Phone: 785.537.4750; Fax: 785.537.1493.

·**4-6, Missouri Milk, Food & Environmental Health Association Annual Meeting,** Ramada Inn, Columbia, MO. For additional information, contact Stephen St. Clair at 573.221.1166.

·**6-9 IAFIS Annual Conference,** The Westin LaPaloma, Tucson, AZ. For further information, contact Dorothy Brady at 703.761.2600.

·**7-12, 2000 Conference for Food Protection,** Hyatt Regency Hotel, Milwaukee, WI. For additional information, contact Trevor Hayes, CFP Executive Secretary, 1085 Denio Ave., Gilroy, CA 95020-9206; Phone/Fax: 408.848.2255; E-mail: TWHgilroy@aol.com.

·**12, Metropolitan Association of Dairy, Food and Environmental Specialists Annual Spring Conference,** Victorian Manor, Edison, NJ. For further information, contact Fred Weber at 609.584.7677.

·**12-14, Michigan Environmental Health Association 55th Annual Conference,** Kewadin Conference Center, Sault Ste. Marie, MI. For further information, contact Leslie Askwith at 906.635.3624.

·**13, Kansas Association of Sanitarians Spring Meeting,** at Mount Conference Center, Atchinson, KS. For additional information, contact Chris McVey at 316.342.4864.

·**16-19, Foodborne Pathogens 2000: Perspectives and Interventions,** Crowne Plaza, Ar-

lington/Crystal City, VA. Sponsored by the Society for Industrial Microbiology. For more information, contact 3929 Old Lee Highway, Suite 92A, Fairfax, VA 22030-2421; Phone: 703.691.3357; Fax: 703.691.7991; E-mail: info@simhq.org.

·**27, Indiana Environmental Health Association, Inc., Spring Educational Conference** at Valle Vista in Greenwood. For additional information, contact Helene Uhlmann at 219.853.6358 or Bob Schmidt at 812.349.2542.

·**30-May 3, American Dairy Products Institute (ADPI) and American Butter Institute (ABI) 2000 Joint Annual Meeting,** Chicago Hilton & Towers Hotel, Chicago, IL. For more information, contact Dr. Warren Clark, Jr., ADPI at 312.782.4888; 312.782.5455; Fax: 312.782.5299.

## MAY

**7-11, 8th World Salt Symposium Salt 2000,** in The Hague. Participants will be informed of the developments that are important for their respective activities in relation to salt. For further information, contact Dr. Justus M. de Jong, Phone: 31.74.2443908; Fax: 31.74.2443272; E-mail: Salt.2000@inter.NL.net.

·**7-12, 3-A Sanitary Standards Annual Committee Meetings,** Four Point Sheraton Hotel, Milwaukee, WI. For additional information, contact Philomena Short at 703.761.2600.

**13-17, Dietary Fibre – 2000,** Dublin, Ireland, Berkeley Court Hotel, Dublin. For additional information, contact Amy Hope, American Association of Cereal Chemists, 3340 Pilot Knob Road, St. Paul, MN 55121-2097; Phone: 651.454.7250; Fax: 651.454.0766; E-mail: aacc@scisoc.org.

·**16-17, Pennsylvania Assn. of Milk, Food & Environmental Sanitarians Meeting** at the Nittany Lion Inn, State College, PA. For further information, contact Eugene Frey at 717.397.0719.

## JUNE

·**5-7, Texas Assn. of Milk, Food & Environmental Sanitarians,** Holiday Inn South, Austin, TX. For further information, contact Ron Richter at 409.845.4409.

·**7-8, Associated Illinois Milk, Food & Environmental Sanitarians Field Representative Meeting.** For further information, contact Tom Gruetzmacher at 815.395.8797.

International Association for
Food Protection
Formerly IAMFES

6200 Aurora Avenue, Suite 200W
Des Moines, IA 50322-2863, USA
Phone: 800.369.6337 • 515.276.3344
Fax: 515.276.8655
E-mail: info@foodprotection.org
Web site: www.foodprotection.org

**The use of the Audiovisual Library is a benefit for the Association Members. Please 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.**
**(SHIP TO: Please print or type.)**

First Name _____ M.I. _____ Last Name _____
Company _____ Job Title _____
Mailing Address _____
(Please specify: ❒ Home ❒ Work) Member ID No. _____
City _____ State or Province _____
Postal Code/Zip + 4 _____ Country _____
Telephone # _____ Fax # _____
E-mail _____ Date Needed _____

**For Association Members Only**

**PLEASE CHECK THE APPROPRIATE BOX**

## AUDIOVISUAL LIBRARY

### DAIRY

❒ D1170 3-A Symbol Council
❒ D1180 10 Points to Dairy Quality
❒ D1010 The Bulk Milk Hauler: Protocol & Procedures
❒ D1020 Causes of Milkfat Test Variations & Depressions
❒ D1030 Cold Hard Facts
❒ D1040 Ether Extraction Method for Determination of Raw Milk
❒ D1050 The Farm Bulk Milk Hauler
❒ D1060 Frozen Dairy Products
❒ D1070 The Gerber Butterfat Test
❒ D1080 High-Temperature, Short-Time Pasteurizer
❒ D1100 Mastitis Prevention and Control
❒ D1110 Milk Plant Sanitation: Chemical Solution
❒ D1120 Milk Processing Plant Inspection Procedures
❒ D1130 Pasteurizer - Design and Regulation
❒ D1140 Pasteurizer - Operation
❒ D1150 Processing Fluid Milk

### ENVIRONMENTAL

❒ E3010 The ABCs of Clean – A Handwashing & Cleanliness Program for Early Childhood Programs
❒ E3020 Acceptable Risks?
❒ E3030 Air Pollution: Indoor
❒ 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)
❒ E3080 Fit to Drink
❒ E3110 Garbage: The Movie
❒ E3120 Global Warming: Hot Times Ahead
❒ E3130 Kentucky Puhlic Swimming Pool & Bathing Facilities
❒ E3135 Plastic Recycling Today: A Growing Resource
❒ E3140 Putting Aside Pesticides
❒ E3150 Radon
❒ E3160 RCRA – Hazardous Waste
❒ 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
❒ F2440 Cleaning & Sanitizing in Vegetable Processing Plants: Do It Well, Do It Safely!
❒ F2010 Close Encounters of the Bird Kind
❒ F2037 Cooking and Cooling Meat and Poultry Products
❒ F2030 "Egg Games" Foodservice Egg Handling and Safety
❒ F2020 Egg Handling & Safety
❒ F2036 Emerging Pathogens and Grinding and Cooking Comminuted Beef
❒ F2035 Fabrication and Curing of Meat and Poultry Products
❒ F2040 Food Irradiation
❒ F2045 Food Microbiological Control
❒ 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
❒ F2120 Food Safety: For Goodness Sake, Keep Food Safe
❒ F2110 Food Safety is No Mystery
❒ F2130 Food Safety: You Make the Difference
❒ F2135 Get with a Safe Food Attitude
❒ 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
❒ F2160 GMP: Sources & Control of Contamination during Processing
❒ F2165 HACCP and Its Application to the Food Industry
❒ F2180 HACCP: Safe Food Handling Techniques
❒ F2170 The Heart of HACCP
❒ 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
❒ F2280 Principles of Warehouse Sanitation
❒ F2290 Product Safety & Shelf Life
❒ F2220 Proper Handling of Peracidic Acid
❒ F2230E Purely Coincidental - English
❒ F2310 Safe Food: You Can Make a Difference
❒ F2320 Safe Handwashing
❒ F2330 Sanitation for Seafood Processing Personnel
❒ F2340 Sanitizing for Safety
❒ F2350 SERVSAFE® Serving Safe Food (4 Videos)
❒ F2360 SERVSAFE® Serving Safe Food Second Edition (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
❒ M4040 Legal Aspects of the Tampering Case
❒ M4050 Personal Hygiene & Sanitation for Food Processing Employees
❒ M4060 Psychiatric Aspects of Product Tampering
❒ M4070 Tampering: The Issue Examined

International Association for
Food Protection
Formerly IAMFES

6200 Aurora Avenue, Suite 200W
Des Moines, IA 50322-2863, USA
Phone: 800.369.6337 • 515.276.3344
Fax: 515.276.8655
E-mail: info@foodprotection.org
Web site: www.foodprotection.org

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

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 | |
| | Procedures to Investigate Arthropod-borne and Rodent-borne Illness | 6.00 | 12.00 | |

**SHIPPING AND HANDLING –** $2.00 (US) $4.00 (Outside US)
Each additional booklet $1.00

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

Shipping/Handling _____
Booklets Total _____

## OTHER PUBLICATIONS

| Quantity | Description | Member or Gov't. Price | Non-Member Price | TOTAL |
|---|---|---|---|---|
| | Pocket Guide to Dairy Sanitation (minimum order of 10) | $ .50 | $ .75 | |
| | Before Disaster Strikes...A Guide to Food Safety in the Home (minimum order of 10) | .50 | .75 | |
| | *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 | |

**SHIPPING AND HANDLING –** Guide Booklets – per 10 $2.50 (US) $3.50 (Outside US)
*Includes shipping and handling

Shipping/Handling _____
Other Publications Total _____

## 3-A SANITARY STANDARDS

| Quantity | Description | Member or Gov't. Price | Non-Member Price | TOTAL |
|---|---|---|---|---|
| | Complete Set 3-A Dairy & Egg Standards | $125.00 | $250.00 | |
| | Five-year Update Service on 3-A Dairy & Egg Standards (new and revised standards only) | 165.00 | 330.00 | |

**SHIPPING AND HANDLING –** Each set $6.25 (US) $10.25 (Outside US)

Shipping/Handling _____
3-A Sanitary Standards Total _____
**TOTAL ORDER AMOUNT** _____

**Payment Must be Enclosed for Order to be Processed**
**★ US Funds on US Bank ★**

❒ CHECK OR MONEY ORDER ENCLOSED ❒ VISA ❒ MasterCard ❒ Discover

Exp. Date _____

SIGNATURE _____

**3 EASY WAYS TO ORDER:**
**Phone:** 515.276.3344; 800.369.6337
**Fax:** 515.276.8655
or **Mail** your order to the Association address listed above.

Prices effective through August 31, 2000

# MEMBERSHIP APPLICATION

International Association for
Food Protection
Formerly IAMFES

6200 Aurora Avenue, Suite 200W
Des Moines, IA 50322-2863, USA
Phone: 800.369.6337 • 515.276.3344
Fax: 515.276.8655
E-mail: info@foodprotection.org
Web site: www.foodprotection.org

## 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 _____

## MEMBERSHIP CATEGORIES:

| | US | Canada/ Mexico | International |
|---|---|---|---|
| ❒ **Membership with *JFP & DFES*** ◀ **BEST VALUE**<br>(12 issues of the *Journal of Food Protection* and *Dairy, Food and Environmental Sanitation*) | $140.00 | $165.00 | $210.00 |
| ❒ **Membership with *DFES***<br>(12 issues of *Dairy, Food and Environmental Sanitation*) | $85.00 | $95.00 | $110.00 |
| ❒ **Sustaining Membership**<br>(Includes advertising and exhibit discounts and more! Contact the Association office for additional benefits) | $525.00 | $525.00 | $525.00 |
| ***Student Membership** | | | |
| ❒ *JFP* and *DFES* | $70.00 | $95.00 | $140.00 |
| ❒ *Journal of Food Protection* | $42.50 | $57.50 | $87.50 |
| ❒ *Dairy, Food and Environmental Sanitation* | $42.50 | $52.50 | $67.50 |

***Full-time student verification must accompany this form**

**All Prices Include Shipping & Handling**

## TOTAL MEMBERSHIP PAYMENT:

$ _____

**US FUNDS on US BANK**

**(Prices effective through August 31, 2000)**

**Payment Options:**

❒ Check Enclosed ❒ VISA ❒ MasterCard ❒ Discover

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

Exp. Date _____

Signature _____

**DO NOT USE THIS FORM FOR RENEWALS**

# The 20-minute Listeria Test from Oxoid. Because time is money.

## The Oxoid Listeria Rapid Test is a fast and reliable method for the detection of Listeria species in food samples.

1. After just two 21-hour enrichment steps, place 135ul of the sample into this Clearview™ Test Unit window.

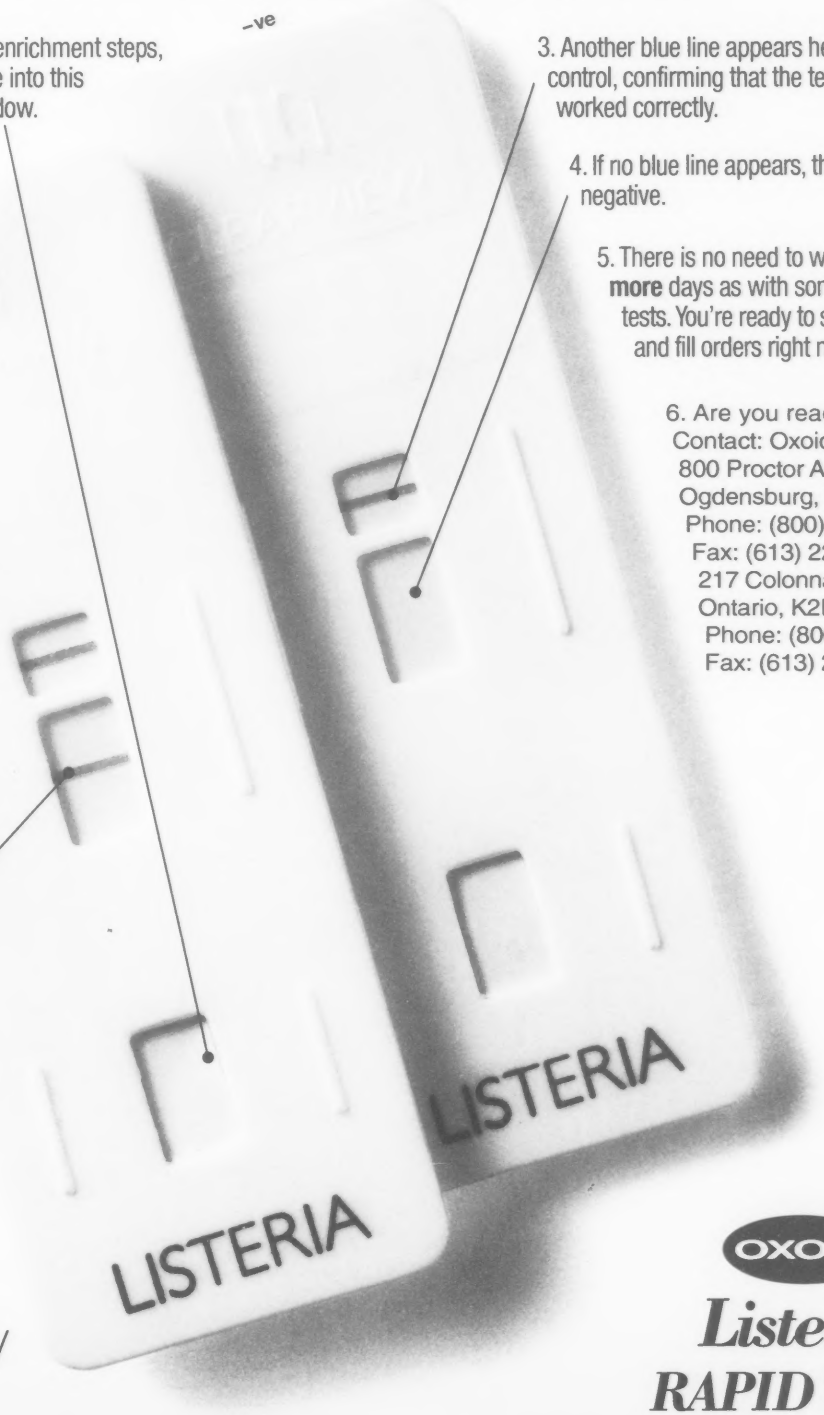
2. Only 20 minutes later, a blue line in this window clearly indicates the presence of Listeria species.

3. Another blue line appears here as a control, confirming that the test has worked correctly.

4. If no blue line appears, the sample is negative.

5. There is no need to wait up to 5 **more** days as with some other tests. You're ready to ship product and fill orders right now.

6. Are you ready to call for details
Contact: Oxoid Inc.
800 Proctor Ave.,
Ogdensburg, NY 13669.
Phone: (800) 567-TEST.
Fax: (613) 226-3728. Or Oxoid Inc
217 Colonnade Road, Nepean,
Ontario, K2E 7K3 Canada.
Phone: (800) 267-6391.
Fax: (613) 226-3728.




INCORPORATING
CLEARVIEW
LISTERIA

OXOID
*Listeria*
*RAPID TEST*

Clearview is a registered trademark.

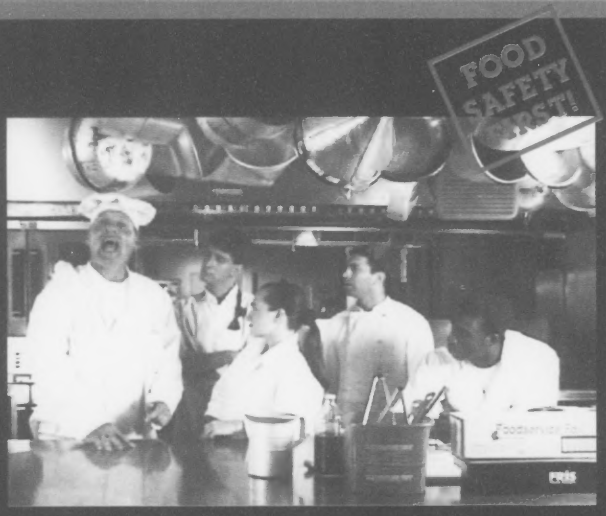
Reader Service No. 126

# Products For Your Health!

## Food Safety First!

Separate 10 minute on-the-job training video series

- -Top Ten Causes of Foodborne illness
- -Personal Hygiene & Handwashing
- -Cross Contamination
- -Cleaning & Sanitation
- -Time and Temperature Abuse




Teaching principles which are applicable to all aspects of food service
A sample program is available on CD-ROM. See us on the Internet for details!

For More about our products, visit our websites

www.foodsafetyfirst.com www.glogerm.com

Are your employees spreading germs? Find out with Glo Germ! Glo Germ is a special product allowing people to see germs in a new light! When conventional infection control and proper food handling techniques fail, turn to Glo Germ. Glo Germ's "Germs You Can See" training solution will will help your employees and customers think safer!

GLO GERM™

Glo Germ™ Food Safety First™

150 East Center St Moab UT. 84532

1 800-842-6622 EXT. 125