

ISSN: 1043-3546

December • 1989

Box 701 • Ames • Iowa • 50010

Vol • 9 • No. 12 • Pages 693-752

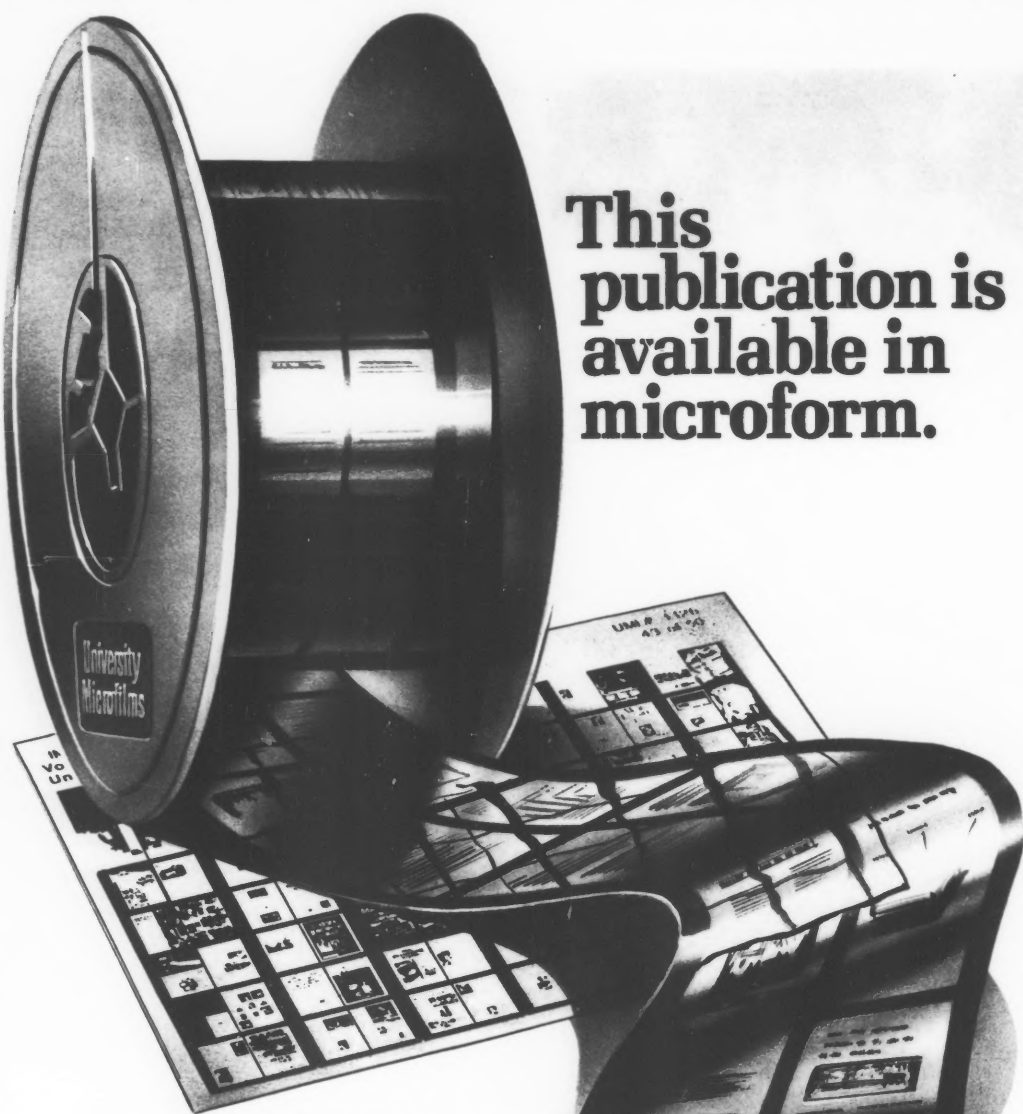
DAIRY, FOOD AND ENVIRONMENTAL

SANITATION

DECEMBER 1989

EXP 90/12
UNIVERSITY MICROFILMS
INTERNATIONAL
300 NORTH ZEEB ROAD
ANN ARBOR, MI 48106





**This
publication is
available in
microform.**

University Microfilms International reproduces this publication in microform: microfiche and 16mm or 35mm film. For information about this publication or any of the more than 13,000 titles we offer, complete and mail the coupon to: University Microfilms International, 300 N. Zeeb Road, Ann Arbor, MI 48106. Call us toll-free for an immediate response: 800-521-3044. Or call collect in Michigan, Alaska and Hawaii: 313-761-4700.

**University
Microfilms
International**

Please send information about these titles:

Name _____

Company/Institution _____

Address _____

City _____ State _____ Zip _____

Phone () _____

PUREL BRAND™ The Total Hand Sanitizing System

Reduces the risk of foodborne disease

The Purel Hand Sanitizing System consists of two products: Purel Instant Hand Sanitizer and Purel Antibacterial Lotion Soap. These products can significantly lower the level of germs on hands safely and conveniently.

Try the Purel products for yourself. Return postcard for **FREE** samples and research data.



P.O. Box 991, Akron, OH 44309-0991
• Phone Toll Free (800)-321-9647
EXT. 424 or 296

NAME _____
ORGANIZATION _____
STREET _____
CITY _____ STATE _____ ZIP _____
TELEPHONE _____

PUREL
BRAND™
**The Total Hand
Sanitizing System**

Phone-Toll-Free (800)-321-9647.

Other IAMFES Publications

IAMFES also publishes:

- Procedures to Investigate Foodborne Illness
- Procedures to Investigate Waterborne Illness
- Procedures to Investigate Arthropod-borne and Rodent-borne Illness
Used by health department and public health personnel nationwide, these manuals detail investigative techniques and procedures based on epidemiologic principles for the identification and analysis of illness outbreaks and their sources.
- 3-A Sanitary Standards for Dairy and Egg Processing Equipment
Formulated by the cooperative effort of industry and regulatory groups, the standards represent criteria for the cleanability of dairy and egg processing equipment. The standards cover materials and fabrication of the equipment design.

DFES
JFP
12/89
1/90

For order information, check the appropriate boxes, complete the return address and return to IAMFES.



NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY MAIL
FIRST CLASS PERMIT NO. 1950 AKRON, OH 44309

POSTAGE WILL BE PAID BY ADDRESSEE



DFES
JFP
12/89
1/90

Go-Jo Industries, Inc.
Attn: Bill Gallien
P.O. Box 991
Akron, OH 44398-9971



Name _____
Address _____
City _____
State/Prov. _____ ZIP _____

Place
Stamp
Here

IAMFES

P.O. Box 701
502 E. Lincoln Way
Ames, Iowa 50010



Restaurants



Convenience stores



Restaurant washrooms



PUREL
BRAND™

The Total Hand Sanitizing System

Reduces the risk of foodborne disease

Government statistics indicate that 25% of all foodborne illnesses are due to improper hand washing by foodservice employees. *The Purel Total Hand Sanitizing System can help reduce this risk.*

The Purel Hand Sanitizing System consists of two products:

Purel Instant Hand Sanitizer, a unique waterless degemring gel, is an adjunct to conventional soap and water washing. It kills approximately 99.5% of foodborne illness-causing organisms in 15 seconds. Purel Instant Hand Sanitizer can be used right at the workstation in restaurant drive-throughs, cash registers, food prep areas, etc.

Purel Antibacterial Lotion Soap is fortified with PCMX, making it extremely efficacious. It has a pleasant citrus fragrance and provides mild rich lather which contributes to increased hand washing compliance.

Independent research fielded by a major fast food chain proved the Purel System increased hand washing compliance and reduced total cfu on hands by over 49%.

Try the Purel System for yourself
Call or write for **FREE** samples and research data

GOJO
INDUSTRIES

P.O. Box 991, Akron, OH 44309-0991
• Phone-Toll-Free (800)-321-9647.
EXT. 424-296

IAMFES

Announcement Developing Scientist Awards

(Supported by Sustaining Members)

Awards

Five (5) awards will be presented: 1st place, \$500 and a plaque; 2nd place, \$200 and a certificate; 3rd place, \$100 and a certificate; 4th place, \$50 and a certificate; 5th place, \$50 and a certificate. All of the winners will receive a 1 year membership including both *Dairy, Food and Environmental Sanitation* and the *Journal of Food Protection*.

Purpose

1. To encourage graduate students to present their original research at the IAMFES annual meeting.
2. To foster professionalism in graduate students through contact with peers and professional members of IAMFES.
3. To encourage participation by graduate students in IAMFES and the annual meeting.

Who Is Eligible

Graduate students enrolled in M.S. or Ph.D. programs at accredited universities or colleges whose research deals with problems related to environmental, food and/or dairy sanitation, protection and safety. Candidates cannot have graduated more than one (1) year prior to the deadline for submitting abstracts.

Criteria

1. A short abstract of the paper must be submitted to the IAMFES office by January 1 of each year. (Use the blue abstract forms from the October issue, if possible.)
2. The author must indicate on the abstract form the desire to be considered for the competition.
3. The paper and the student must be recommended and approved for the competition by the major professor or department head.
4. The paper must represent original research done by the student and must be presented by the student.
5. An extended abstract form will be sent to all who enter the competition, and must be completed and returned by the deadline date on that form.
6. Each student may enter only one (1) paper in the competition.
7. Papers are to be presented as oral papers and should be approximately fifteen (15) minutes in length with an additional five (5) minutes allowed for questions, for a total of twenty (20) minutes.
8. The use of slides or other visual aids is encouraged.
9. The papers will be judged by an independent panel of judges.
10. Awards will be presented at the annual IAMFES Awards Banquet.

Publishers of the *Journal of Food Protection and Dairy, Food and Environmental Sanitation*

International Association of Milk, Food and Environmental Sanitarians Inc.

P.O. Box 701 - 502 E. Lincoln Way - Ames, Iowa 50010 - (515) 232-6699 - 1-800-525-5223 (outside of Iowa)

NOTICE

Beginning January 1, 1990

NEW ADDRESS: 502 E. Lincoln Way
Ames, Iowa 50010-6666

NEW IN WATS: 1-800-369-MFES (6337)
(Includes Canada and Iowa)

TO SERVE YOU BETTER



Thoughts From the President . . .

By
Ron Case
IAMFES President



I have had the opportunity to visit a number of the local affiliates since I have been on the Executive Board. At present we have 31 affiliates in the United States and Canada. Massachusetts has just received its charter as our latest affiliate. I have been very impressed with the number of good things I see happening with the affiliates. The programs and the speakers have been excellent. Some of the speakers have been recruited to make presentations at the annual international meeting. These meetings give the members an opportunity to discuss items of local concern as well as things that are happening in other places.

Affiliates give scholarships to students at local colleges and universities who are majoring in fields related to the objectives of IAMFES. Some also have scholarships for children of members. The cost of these scholarships is covered by local fund raising events or industry sponsorship.

Besides helping to develop our leaders of tomorrow, awards are also given to our leaders of today for outstanding contributions to their field, to their community, and to the association. Many of the recipients of local affiliate awards have also received awards from IAMFES for their contributions.

Affiliates conduct training sessions on such topics as correct operation of pasteurizers. This allows their members and others to keep abreast of the latest developments in critical areas.

I found the affiliates have dedicated leaders who have a real concern for issues of food safety and the

environment. These leaders spend a number of hours working on their aforementioned programs, talking to members, planning meetings and working to further advance the cause of IAMFES.

Affiliates are very important to IAMFES. The chairperson of the affiliates council, Bill Coleman, is a member of the Executive Board and is responsible for keeping the concerns of the affiliates before the Board. Dee Buske is the affiliate liaison with the Ames office. She has the responsibility for assisting the affiliates, whether it is passing ideas from one affiliate to another or helping to find knowledgeable speakers for meetings. Many of the board members are willing to and have attended local affiliate meetings to make presentations, to talk with the local members about their concerns, and to bring these concerns to the Executive Board.

One of the concerns that has been expressed to me is that many members of IAMFES are not members of the affiliate and do not participate in the local affiliate meetings. If you are one of these, the local affiliates have a lot to offer and I would encourage you to contact the leaders of your local affiliate who are listed on pages 6 and 7 of the IAMFES Membership Directory, or call the Ames office at their toll free number, 1-800-525-5223, for more information on what is happening with your local affiliate.

Affiliates are a vital part of the international association and are providing a needed service to the local members and their communities. Keep up the good work.

IAMFES Sustaining Members

ABC Research, Gainesville, FL

Access Medical Systems, inc., Branford, CT

Accurate Metering Systems, inc., Schaumburg, IL

Alex C. Ferguson, Frazer, PA

Alfa-Laval Agri, inc., Kansas City, MO

Alpha Chemical Services, Inc., Stoughton, MA

Amersham International P.L.C., Little Chalfont, Buckinghamshire, England

AMPCO Pumps, Milwaukee, WI

Anderson Chemical Co., Litchfield, MN

Anderson instrument Co., Fultonville, NY

Applied Microbiology, Brooklyn, NY

APV Crepaco, Chicago, IL

Aquafine, Valencia, CA

Associated Milk Producers, inc., Schaumburg, IL

Babson Bros. Co., Romeoville, IL

Becton Dickinson Microbiology Systems, Cockeysville, MD

Borden, inc., Houston, TX

Canada Packers, Mississauga, Ontario Canada

Capitol Vial Corp., Fonda, NY

Carnation Co., Los Angeles, CA

Centrico inc., Elgin, IL

Cherry-Burrell Corp., Cedar Rapids, IA

Commercial Testing Lab., inc., Colfax, WI

Control One, inc., Greenwich, CT

DairiLab Services, Manitowoc, WI

Dairy Quality Control inst., St. Paul, MN

Dairyman, Inc., Louisville, KY

Darigoid, Seattle, WA

Dean Foods, Rockford, IL

Diversey/Wyandotte, Wyandotte, MI

Domino's Pizza, Inc., Ann Arbor, MI

Eastern Crown, inc., Vernon, NY

Educational Testing Services, Langhorne, PA

Environmental Test Systems, Inc., Elkhart, IN

Foss Food Technology Corporation, Eden Prairie, MN

FRM Chem, Inc., Washington, MO

Gene Trak, Framingham, MA

Gerber Products Co., Fremont, MI

Gist Brocades, Charlotte, NC

GoJo industries, Akron, OH

Gundle Lining Systems, Inc., Houston, TX

Henkel Corp., Ambler, PA

H. B. Fuller Co., Minneapolis, MN

IBA Inc., Millbury, MA

Integrated BioSolutions, inc., Princeton, NJ

Kendall Co., Boston, MA

Klenzade Division, Bloomington, MN

Land O'Lakes Inc., Minneapolis, MN

Maryland & Virginia Milk Prod. Assn., inc., Reston, VA

Metz Sales, Inc., Williamsburg, PA

Micheison Labs, Commerce, CA

Mid America Dairyman, Inc., Springfield, MO

Milk industry Foundation, Washington, DC

Minnesota Valley Testing Laboratories, New Ulm, MN

Nasco International, Fort Atkinson, WI

National Mastitis Council, Arlington, VA

National Sanitation Foundation, Ann Arbor, MI

Norton Company Transflow Tubing, Akron, OH

Organon Teknika, Durham, NC

Oxoid USA, inc., Columbia, MD

Penicillin Assays, inc., Malden, MA

The Pillsbury Company, Minneapolis, MN

Ross Laboratories, Columbus, OH

Selberling Associates, Inc., Roscoe, IL

Silliker Labs, Chicago Heights, IL

SmithKline Animal Health Products, West Chester, PA

Sparta Brush Co. inc., Sparta, WI

Summit Laboratory Supply, inc., Sarasota, FL

Swageiok Co., Solon, OH

Tekmar Co., Cincinnati, OH

Time Products, Inc., Atlanta, GA

The Stearns Tech Textile Co., Cincinnati, OH

3M/Medical-Surgical Div., St. Paul, MN

Vicam, Somerville, MA

Vitek Systems, Hazelwood, MO

Walker Stainless Equipment Co., New Lisbon, WI

West Agro Inc., Kansas City, MO

Wisconsin Analytical Laboratory, inc., Watertown, WI

Dairy, Food and Environmental Sanitation **CONTENTS**

Articles:

A Simple Shelf-Life Estimation Method As An Integral Part of A Total Dairy Quality Assurance Program 698
J. Russell Bishop

Private Pesticide Residue Testing Programs: Marketing and Legal Implications 702
Steven A. Brown

Coping With the Food Fright 706
Joan Murray

Integrated Pest Management Systems Protect Environment and Boost Profits 708
Robert L. Haney

News 642

New Set of Food Safe Series Tapes Added to IAMFES Lending Library, Marth Receives Laboratorian Award, NRA to Sponsor First National Symposium on Solid Waste.

* * * and much more * * *

Food and Environmental Hazards To Health 716

FDA Food Service Code Interpretations 725

Association News

Developing Scientist Award Announcement 694
Thoughts From the President 695
Affiliate News 726
Affiliate Calendar 726
Affiliate Officers 728
Audio Visuals Library 731

From The Ames Office 752

New IAMFES Members 733

DFES Instructions for Authors .. 735

DFES Index 736

Advertising Index 738

Business Exchange 740
 "Classifieds"

3-A Sanitary Standards 743
 19-04

Coming Events 748

Membership Application 751

ABOUT THE COVER... *Courtesy of the New Jersey Division of Travel and Tourism, CN 826, Trenton, N.J. 08625-0826. Photo credit goes to Jean McDougall*

Dairy, Food and Environmental Sanitation (ISSN 1043-3546) is published monthly by the International Association of Milk, Food and Environmental Sanitarians, Inc., executive offices at PO Box 701, 502 E. Lincoln Way, Ames, IA 50010. Printed by Heuss Printing, Inc., 911 N. Second St., Ames, IA 50010. Second-class Postage paid at Ames, IA. POSTMASTER: Send address changes to IAMFES, 502 E. Lincoln Way, Ames, IA 50010-0701. The publishers do not warrant, either expressly or by implication, the factual accuracy of the articles or descriptions herein, nor do they so warrant any views or opinions offered by the authors of said articles and descriptions. Manuscripts: Correspondence regarding manuscripts and other reading materials should be addressed to Margaret Marble, PO Box 701, Ames, IA 50010-0701. 515-232-6699. "Instructions to Contributors" can be obtained from the editor. Orders for Reprints: All orders should be sent to DAIRY, FOOD AND ENVIRONMENTAL SANITATION, IAMFES, Inc., PO Box 701, Ames, IA 50010-0701. Note:

Single copies of reprints are not available from this address; address reprint requests to principal author. **Business Matters:** Correspondence regarding business matters should be addressed to Steven K. Halstead, IAMFES, PO Box 701, Ames, IA 50010-0701. **Subscription Rates:** \$83.00 per year. Single copies \$10.00 each. No cancellations accepted. U.S. FUNDS ONLY. **Sustaining Membership:** A sustaining membership in IAMFES is available to companies at a rate of \$375 per year, which includes \$100 credit toward an ad in the "annual meeting issue" of the Journal, the July issue. For more information, contact IAMFES, PO Box 701, Ames, IA 50010-0701, 515-232-6699. **Membership Dues:** Membership in the Association is available to individuals only. Direct dues are \$36 per year and include a subscription to **Dairy, Food and Environmental Sanitation**. Direct dues and the **Journal of Food Protection** are \$64.00. Affiliate and International Membership include both journals for \$64, plus affiliate dues. Student membership is \$19.00 per year, with verification of student status, and

includes **Dairy, Food and Environmental Sanitation** or **Journal of Food Protection**. No cancellations accepted. **Claims:** Notice of failure to receive copies must be reported within 30 days domestic, 90 days foreign. All correspondence regarding changes of address and dues must be sent to IAMFES, Inc., PO Box 701, Ames, IA 50010-0701, 515-232-6699. Postage: Canada and foreign add \$12 PER JOURNAL subscription. U.S. FUNDS ONLY-ON U.S. BANK.

**IAMFES
EXECUTIVE BOARD**

President, Ron Case, Kraft Inc., Kraft Court - OP/S, Glenview, IL 60025, 312-998-2056
President-Elect, Robert Sanders, PHS/FDA, 200 C St. SW, Washington, D.C. 20204, 202-485-0138
Vice-President, Damien A. Gabis, Silliker Labs, Inc., 1304 Halsted St., Chicago Heights, IL 60411, 312-756-3210
Secretary, Michael P. Doyle, Univ. of Wisconsin, 3110 Grandview Blvd., Madison, WI 53713, 608-262-6936
Past President, Robert Gravani, 8A Stock-

ing Hall, Cornell University, Ithaca, NY 14853, 607-255-3262
Affiliate Council Chairperson, William W. Coleman II, Minnesota Dept. of Agriculture, 90 West Plato Blvd., St. Paul, MN 55107, 612-298-1586
Executive Mgr., Steven K. Halstead, Box 701, Ames, IA 50010, 515-232-6699

EDITORS

STEVEN K. HALSTEAD, *Managing Editor*, Box 701, Ames, IA 50010, 515-232-6699
MARGARET THORNTON MARBLE, *Associate Editor*, Box 701, Ames, IA 50010
HENRY ATHERTON, *Technical Editor*, University of Vermont, Carrigan Hall, Burlington, VT 05405.

EDITORIAL BOARD

K. ANDERSON Ames, IA
H. V. ATHERTON Burlington, VT
K. J. BAKER Rockville, MD
S. BARNARD University Park, PA
H. BENGSCHE Springfield, MO
F. BODYFELT Corvallis, OR

J. BRUHN Davis, CA
J. BURKETT Sioux City, IA
J. CHAMBERS West Lafayette, IN
W. CLARK Chicago, IL
W. W. COLEMAN St. Paul, MN
O. D. COOK Rockville, MD
R. DICKIE Madison, WI
F. FELDSSTEIN Cutpeper, VA
R. FUJUKU Mt. Juliet, TN
J. GERBERICH Eau Claire, WI
P. HARTMAN Ames, IA
C. HINZ Le Roy, NY
D. JOLLEY Bradenton, FL
W. LAGRANGE Ames, IA
J. LITTLEFIELD Austin, TX
P. MARTIN Warrenville, IL
J. MIRANDA Los Angeles, CA
D. NEWSLOW Orlando, FL
D. PEPPER Sioux City, IA
M. PULLEN St. Paul, MN
J. REEDER Arlington, VA
D. ROLLINS Springfield, MO
R. SANDERS Washington, DC
P. C. VASAWADA River Falls, WI
E. C. WRIGHT Bella Vista, AR

A Simple Shelf-Life Estimation Method As An Integral Part Of A Total Dairy Quality Assurance Program

J. Russell Bishop

Department of Food Science and Technology
Virginia Polytechnic Institute and State University, Blacksburg, VA 24061

ABSTRACT

As part of a total dairy quality control program along with Standard Plate Count, Coliform count, and sensory evaluation, there needs to be a simple, rapid method for assessing dairy product quality and/or estimating shelf-life. Such a method exists which involves preliminary incubation of a milk sample at 21°C for 18h, followed by plating in/on Standard Methods Media which is incubated at 21°C for 25-48h. Bacterial counts generated can be used to "categorize" milk as to $\leq 10d$, 10-14d, or $\geq 14d$ shelf-life as determined by sensory evaluation.

INTRODUCTION

Various new handling procedures and processing methods and a more critical consuming public have caused the dairy and food industries to re-evaluate their quality standards. Quality means different things to different people and standards are ever-changing. Quality dairy products may be described in two ways:

1. from a consumer standpoint where a high degree of acceptance is necessary considering safety, shelf-life, desirable sensory attributes, and freedom from product defects;
2. another description may be made from the processor standpoint where quality is defined based on conformance to specifications.

These two descriptions coincide in that the specifications must be based on a high degree of consumer acceptance.

The dairy industry has been a leader in establishing programs to give the consumer a product that is pure, of good flavor, of attractive appearance, and of desirable keeping quality. These programs emphasize rigorous laboratory examination of milk and dairy products to insure that this quality is maintained. But quality cannot be inspected into a product, it must be built in! Produc-

tion of high quality milk and dairy products is influenced by several factors including:

- raw milk quality
- milk handling
- milk processing and storage temperatures
- product processing procedures
- post-pasteurization contamination.

There is little doubt that in commercially pasteurized and packaged dairy products, post-pasteurization contamination by psychrotrophic bacteria, i.e., those capable of relatively rapid growth at refrigeration temperatures, is the most common cause of quality defects of microbial origin. Post-pasteurization contamination is synonymous with keeping quality and shelf-life.

DETECTION OF POST-PASTEURIZATION CONTAMINATION

The standard method for the Psychrotrophic Bacteria Count (PBC) involves incubation of Standard Methods (SM) agar for 10d at 7°C (10). A more rapid technique was developed in 1976 by Oliveria and Parmalee (8) whereby psychrotrophic bacteria are enumerated by incubation of SM media at 21°C for 25h with agar or 48h with 3M-Petrifilm (3,4). The incorporation of triphenyl-tetrazolium chloride (TTC) into the Petrifilm medium causes a slight delay in noticeable growth as compared to the original agar method, but the agar plates are much more difficult to count due to the numerous pinpoint colonies and the lack of colony coloration. Due to these, it is recommended agar be allowed to incubate 48h with or without the addition of TTC. The correlation of this modified Psychrotrophic Bacteria Count (mPBC) to the standard PBC is 0.99 (8), and correlation of the Petrifilm mPBC (PmPBC) to mPBC is 0.99 (3,4).

In determining the presence of post-pasteurization contaminants, two major problems are encountered. First of all, time is critical. Second, the number of contaminants in a freshly pasteurized sample may not be present

at easily detectable levels. The major goal of any test used to assess the quality of a perishable dairy product must be to provide reliable and accurate results within a time period that will allow for the performance of effective, corrective measures. In addition to being reliable, accurate, and relatively rapid, a test should be simple and fairly economical.

Standard Plate Count and Coliform Count

The Standard Plate Count (SPC) (10) is not a suitable method for detection of post-pasteurization contamination. The resulting numbers indicate little about the types or organisms and their potential metabolic activities, which ultimately determine the potential shelf-life of the product. Due to the incubation temperature of 32°C (90°F), it excludes most of those organisms that grow at refrigeration temperatures. This is also true of the coliform count (CC) in/on Violet Red Bile agar (10).

Lab Pasteurized Count

Under normal circumstances, the Lab Pasteurized Count (LPC), as conducted (10), indicates very little about subsequent quality of a refrigerated dairy product. The test is designed to estimate the number of thermophilic bacteria which are capable of surviving pasteurization, but (these bacteria) will not necessarily be capable of growth at the storage temperature of fluid dairy products. In fact, very few thermophilic bacteria are also psychrotrophic. Therefore, this group of bacteria has little effect on subsequent quality and shelf-life of fluid dairy products.

Moseley Keeping Quality Test

The Moseley Keeping Quality test (5) is better known as the 7-day count. A milk sample is incubated for 5-7 days at 7°C, and bacteria are then enumerated by the SPC. At present, this is the method by which all others are compared, whether rightly so or not. The correlation of the method to actual shelf-life is 0.70-0.77 (5,6,7,9,12), but the time required for results - 7-9 days - is prohibitive.

Impedance Microbiology

Impedance is the resistance to the flow of an alternating current through a conducting material. The impedance technique relies on the fact that metabolizing microorganisms alter the chemical composition of the growth medium and that these chemical changes cause a change in the impedance of the medium (1). Potential, actual shelf-life is determined in 38h with a correlation of 0.86-0.91 (1,2,4).

Catalase Detection

Catalase enzyme production by bacteria may be used to determine bacterial numbers, but has proved to be of little value without prior treatment of the milk sample by a selective PI. Different types of bacteria produce catalase at varying rates, so one must select for the bacteria they wish to detect. This needed selectivity is illustrated by the increase in correlation values to shelf-life of -0.56 to -0.77 by the detection method following a gram-positive in-

hibitory incubation of the milk sample at 21°C for 18h (4).

Bioluminescence

Bioluminescence is the production of light from a reaction driven by ATP, and is the same reaction that takes place in the tail of a fire-fly. It has been used by researchers to determine bacterial numbers, but has yet to be used quantitatively for quality assessment of dairy products.

Direct Epifluorescent Filter Techniques

The direct epifluorescent filter (microscopic) filter technique (DEFT) involves the filtration of food and milk samples followed by staining of microorganisms of the filter membrane. This filter is then observed using an epifluorescent microscope. Research in Scotland (11) indicates a correlation to shelf-life of 0.72 when conducted after a 30°C/18h incubation.

Virginia Tech Shelf-Life Program

A method which involves a preliminary incubation followed by a simple plating method appears to be reliable, accurate, relatively rapid, economical, and familiar to laboratory personnel - all of the criteria we described earlier. Such a method possessing these properties would be a most useful method for incorporation into a Quality Control/Quality Assurance Program.

A pasteurized fluid milk sample is aseptically placed (10 ml portion) into a sterile test tube. The tube containing the milk sample is then incubated for 18h at 21°C (this temperature is critical). At the completion of the preliminary incubation, the sample is well mixed, a 1/1000 dilution is made, the diluted sample is placed in/on Standard Methods Plate Count media, and incubated at 21°C for 25-48h - Figure 1 (2,4). Remember the previous discussion concerning 25 vs. 48h incubation for agar with or without added TTC. This method will provide an

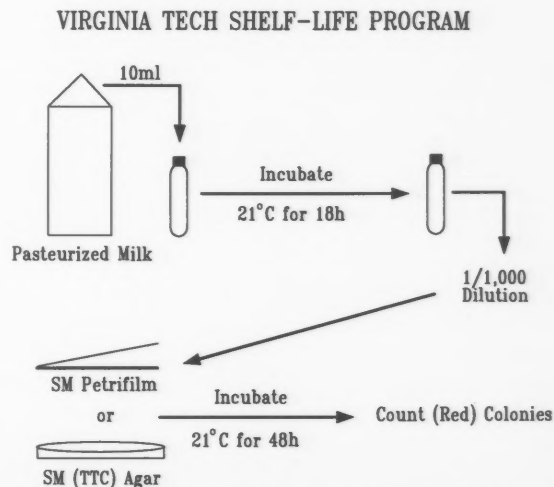


Figure 1. Flow diagram of the Virginia Tech Shelf-life Program.

TABLE 1. Comparison of methods used for quality assessment of pasteurized fluid milk.

Method	Shelf-Life Correlation	Time Required in Hours	Costs (\$)	
			Set-up	Per Sample
Moseley 7-d Count	-0.70 - -0.77	216 (9 days)	0	0.50
Impedance	0.86 - 0.91	38	60,000	2.00
LAL ¹	?	20	0	2.00
Catalase	-0.77	19	5-10,000	1.50
Bioluminescence	?	20	10-30,000	2.00
DEFT ²	-0.72	20	6-30,000	2.00
VTSL ³	-0.89	66	0	0.50

¹Limulus Amoebocyte Lysate assay.

²Direct Epifluorescent Filter Technique.

³Virginia Tech Shelf-Life Program.

estimate of growth potential of psychrotrophic bacteria present in the sample. The time variation for the plate incubation indicates the difference between agar and 3M-Petrim methods, which was described earlier. Because of the pinpoint colonies on the agar, it may be beneficial to allow these to incubate 48h.

The total time required for results from the Virginia Tech Shelf-Life (VTSL) Program is 66h (just less than 3d), with greatly contaminated samples being detected in 42-54h. The correlation of the method to shelf-life of pasteurized fluid milk is 0.89. The contrasts described about each method is better viewed in Table 1. Also included in the table are set-up and per sample supply costs rounded to the nearest \$0.50.

A Simple Quality Control/Quality Assurance Program

The following is a very simple QA/QC program which can be used for any perishable product, but is outlined for pasteurized fluid milk.

Day of processing -
 Standard Plate Count
 Coliform Count
 Virginia Tech Shelf-Life Program
 Sensory evaluation (could be conducted the day after processing)

Code date/Target date -
 sensory evaluation of samples stored at 7°C (45°F)

Such a program will provide standard plate and coliform counts to detect gross contamination and for regulatory

TABLE 2. Shelf-life categorization by the Virginia Tech Shelf-Life Program.

Petrim/Agar Count (cfu/plate)	Total Count (cfu/ml)	Estimated Shelf-life (Days)
≤1	≤1,000	≥14
1 - 200	1,000 - 200,000	10 - 14
≥200	≥200,000	≤10

purposes. Also provided will be an estimation of potential shelf-life due to the 0.89 correlation of VTSL. A "safer" estimation of potential shelf-life is obtained by categorizing samples instead of using a mathematical equation or setting a single cut-off level. By using the data generated, one can quickly classify milk as good, borderline, and bad as illustrated in Table 2. Sensory evaluation the day of (or after processing) will detect potential problems with raw ingredients (powder, etc.), processing parameters, raw milk off-odors/off-flavors, etc. Sensory evaluation at a code or target date of samples stored at 7°C (45°F) will, obviously, indicate correctness of coding and ultimate milk quality.

CONCLUSION

When comparing the Virginia Tech Shelf-Life Program to the Moseley 7-day count, the VTSL is more rapid (3 vs. 9d), more accurate (shelf-life $r = -0.89$ vs. -0.77), and uses less storage/incubator space due to smaller samples being preliminary incubated for less time. As a safeguard to using the categorization schedule in Table 2, it is strongly recommended that the user collect their own data for the VTSL vs. shelf-life as determined by daily sensory evaluation. This will give a better "feel" for what the results mean in a specific location/situation.

Any method ultimately used for shelf-life estimation will depend on many factors. Each situation evaluated will require an analysis of need based on product type and volume, information needed, time available, cost of test method, laboratory set-up and available personnel, and support for a quality control/quality assurance program from top management. The Virginia Tech Shelf-Life Program appears to be sufficiently flexible to meet most needs. The aim of quality control measures that are developed should be to detect and eliminate all sources of post-pasteurization contamination. When this has been accomplished, optimum quality and subsequent shelf-life of dairy products should cease to be a major problem.

REFERENCES

- Bishop, J. R., C. H. White, and R. Firstenberg-Eden. 1984. A rapid impedimetric method for determining the potential shelf-life of pasteurized whole milk. *J. Food Prot.* 47:471-475.
- Bishop, J. R., and C. H. White. 1985. Estimation of potential

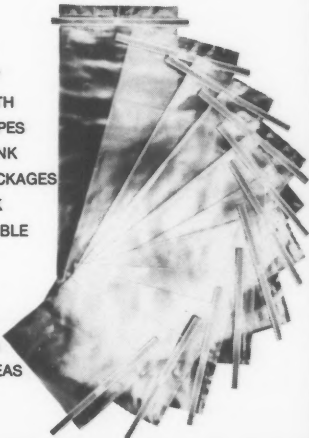
shelf-life of pasteurized fluid milk utilizing bacterial numbers and metabolites. *J. Food Prot.* 48:663-667.

3. Bishop, J. R., and J. Y. Juan. 1988. Improved methods for quality assessment of raw milk. *J. Food Prot.* 51:955-957, 962.
4. Byrne, R. D., J. R. Bishop, and J. W. Boling. 1989. Estimation of potential shelf-life of pasteurized fluid milk utilizing a selective preliminary incubation. Accepted for publication in *J. Food Prot.*
5. Felingham, D., and H. S. Juffs. 1977. Comparison and evaluation of keeping quality tests for pasteurized milk and cream products. *Austral. J. Dairy Technol.* 32:158-162.
6. Johns, C. K. 1969. Tests for estimating shelf-life of milk and milk products. *J. Milk Food Technol.* 32:301-303.
7. Langlois, B. E., H. E. Randolph, and N. M. Crume. 1966. Keeping quality of dairy products obtained at retail outlets. I. Low-fat milk, skim milk, and chocolate flavored milk. *J. Milk Food Technol.* 29:214-217.
8. Oliveria, J. S., and C. E. Parmalee. 1976. Rapid enumeration of psychrotrophic bacteria in raw and pasteurized milk. *J. Milk Food Technol.* 39:269-272.
9. Randolph, H. E., T. R. Freeman, and R. W. Peterson. 1965. Keeping quality of market milk obtained at retail outlets and at processing plants. *J. Milk Food Technol.* 28:92-96.
10. Richardson, G. H. (ed.). 1985. *Standard Methods for the Examination of Dairy Products.* Am. Public Health Assoc. 15th ed. Washington, D.C.
11. Rodriguez, U. M., and G. L. Pettipher. 1984. Use of the direct epifluorescent filter techniques for predicting the keeping quality of pasteurized milk within 24 hours. *J. Appl. Bacteriol.* 57:125-130.
12. Smith, K. L., J. J. Jezeski, and D. W. Wilkins. 1982. The Moseley test as a predictor of the shelf-life of pasteurized milk. *J. Dairy Sci.* 65:221 (Abstract).

MOJONNIER SAMPLE BAGS

STERILIZED BAGS FOR SAMPLES AND FOR OTHER USES

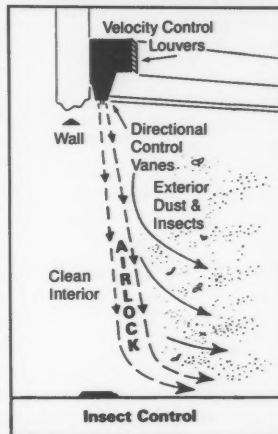
- EASY TO OPEN
- EASY TO CLOSE
- LIQUID TIGHT
- TRANSPARENT OR WITH WRITE-ON STRIPES
- IN POUCHES OR SHRINK WRAPPED BULK PACKAGES
- MANY SIZES IN STOCK
- SPECIAL BAGS AVAILABLE
- HIGHEST QUALITY
- SUPERIOR SERVICE
- COMPETITIVE PRICES
- DISTRIBUTORS IN USA
- CANADA AND OVERSEAS



ALBERT MOJONNIER, INC.
 RD. 1100 NORTH & NORTH HARTFORD STREET
 P.O. BOX 189, EATON, INDIANA 47238 317/396-3351
 FAX: 317/396-9930 TOLL FREE: 1-800-333-3086



MEET THE ORIGINAL MARS AIR DOOR® THAT LOCKS OUT INSECTS, DUST AND FUMES



Wherever clean work areas are required, American-made Mars Air Doors are a must! They're precision-engineered to create a high velocity air-lock curtain that prevents infiltration of insects, dirt, dust and fumes. In fact, unheated Mars Air Doors are approved by the National Sanitation Foundation.

The cleaner you need it, The more you need a Mars Air Door®
 This equipment is ideal for food facilities, refrigerated rooms—any environment where cleanliness is necessary. Installation is easy, with no structural changes or special tools needed. Available in over 75 models including electric or steam heat. Contact Mars today. Talk it over with an experienced professional engineer who can specify the right air curtain for you.



Made in U.S.A.
 14716 South Broadway, Gardena, CA 90248
 (213) 770-1555 Outside CA 1 (800) 421-1266
 FAX (213) 324-3030

Private Pesticide Residue Testing Programs: Marketing and Legal Implications

by Steven A. Brown¹

Today's food supply, especially commercially grown food, depends heavily upon fertilizers, hormones, pesticides, fumigants, and preservatives, among other natural and chemical substances. If improperly used, many of the most popular of these substances can be extraordinarily potent and pose serious risks to humans, animals, and the environment.²

As a result, the government has created a significant body of laws and regulations on the application of pesticides and other substances to the food supply. Nonetheless, many believe that the laws and regulations are incomplete, overly lenient, and ineffectually enforced. In response to this perceived danger, what is emerging is a private testing system outside the governmental regulatory scheme and certification of produce as "residue-free." Fresh fruit and produce have been the focal point for these private programs. This article will concentrate on testing programs for fresh fruit and produce.

Urban, industrial societies place increasing demands upon the agricultural sector to produce more food from less and less land. Not only is it necessary to continually increase production to feed the ever-increasing non-farm population, but fresh meats and produce must retain nutrition and freshness for longer periods of time as the distance from farm to market increases. In addition, as a society's standard of living rises, so too does the demand for higher quality and more varied food.

To attain these goals, farmers have turned to science to develop stronger, more resistant forms of plants and animals. There are nutrition enhancers, flavor enhancers, hybrid products, etc. In addition, there are pesticides, herbicides, fertilizers, fumigants, growth inhibitors, growth enhancers, etc. Each of these has unquestionably conferred substantial benefits, particularly productivity. But each has come with a price, often a high one - and often at the expense of health or the environment.³

While this discussion focuses on pesticide chemicals, it should not be assumed that other contributors to our agricultural plenty are without risk. Manure, for example, is an excellent fertilizer, but it is a haven for bacteria and disease-carrying insects.

By definition, pesticides kill pests. They are poisons. Not infrequently, they may also injure or kill other living things. It is therefore critical to have some method of assuring that food products derived from raw materials to

which pesticides have been applied may be consumed safely.

The Regulatory Framework

The Environmental Protection Agency (EPA), the Food and Drug Administration (FDA) and the Department of Agriculture (USDA)⁴ each have been assigned responsibilities in protecting the food supply from unsafe pesticide residues. Under the Federal Insecticide, Fungicide and Rodenticide Act (FIFRA), a pesticide may not be used in this country unless it has first been approved by the EPA.⁵ In making its decision, EPA will consider the potential impact of the pesticide upon those who apply the pesticide and upon those who may come in contact with it. It also will consider the pesticide's effect upon the environment.⁶

If the use of the pesticide is found to lead to residues in food or feed, EPA has the responsibility of establishing a pesticide residue tolerance.⁷ This is the maximum amount of the pesticide that may be contained in a food and still be considered safe. FDA enforces these tolerances for all foods other than meats and poultry products, which are the responsibility of the USDA.⁸

Notwithstanding the regulatory scheme and its implementation, there have been questions raised about the safety of our food because of concern over pesticide residues. There are several reasons underlying this concern:

- a. a general mistrust of the government's ability to perform competently;
- b. a specific mistrust of a Republican Administration's commitment to consumer protection;
- c. a growing awareness of the long term dangers of some pesticides;
- d. greater scientific capability to identify and measure contaminants in ever smaller quantities;
- e. lack of a scientific consensus over what is an acceptable risk level or even if there is such a thing; and
- f. action by individual states to ban products containing residues of certain pesticides.⁹

To date, tolerances have been set for about 300 pesticides and 230 commodities. Residue limits are

established for 8,000 - 9,000 pesticide/commodity combinations. FDA currently collects approximately 15,000 samples per year for testing purposes. The tests FDA conducts are capable of detecting about one-half of the pesticides for which tolerances have been set.¹⁰ The FDA testing program is for enforcement purposes as well as to determine the incidence and levels of pesticide residues in the food supply.

Critics attack the FDA program as inadequate.¹¹ FDA officials respond that the criticism assumes more for the program than FDA ever promised or intended. According to FDA, the federal pesticide residue-testing program does not provide an analysis of a statistically significant portion of the food supply. It does not analyze foods from all important sources or test for all pesticides. The FDA program is not a guarantee that food containing illegal residues will not reach the consumer.¹²

Nonetheless, in releasing a Report of FDA's pesticide monitoring program for 1987, FDA Commissioner Frank Young characterized as a "myth" the belief that consumers are ingesting large and harmful amounts of pesticide residues. Another myth, he said, is that any residue, no matter how little or how legal, is harmful. Tolerances normally incorporate a wide margin of safety, so a violative residue is not necessarily harmful. "The actual residues found are almost always much lower than the tolerances allow . . . Furthermore, residues usually will disappear or decrease during processing, washing and cooking," said Young.¹³

Moreover, in 1987, FDA's testing program found that 98.5% of the domestic product tested did not contain pesticide residues that violate established tolerances.¹⁴

Private Pesticide Residue Testing

At least one entrepreneur has seen this as an opportunity. It is offering a testing service to grocery retailers. Produce "passing" the test is certified to be residue free.¹⁵ The program, which started in California, is spreading across the country and its growth appears to be accelerating.¹⁶ Recently, the FDA announced it is considering making changes in its pesticide program which, among other things, would seek to make use of data from private pesticide testers.¹⁷

It is likely, then, that private pesticide residue-testing programs will be a continuing feature of the grocery industry. It is therefore appropriate to examine some of the marketing and legal implications of this new phenomenon.

Periodically, on an isolated basis, produce containing unsafe levels of pesticide is discovered and destroyed or recalled, but little regulatory action has been taken against a grower or retailer for selling the produce.¹⁸

A recent study by the Food Marketing Institute (FMI) has identified food safety as a major, growing concern of consumers.¹⁹ This concern is underscored by the publicity surrounding some states' actions against products containing ethylene dibromide (EDB)²⁰ or daminozide (ALAR) residues²¹ and California's attack on pesticides through Proposition 65.²²

Therefore, it is not surprising that pesticide-free produce has been attractive to some operators as a marketing tool. During 1987, a firm called Nutri Clean began offering a testing program to supermarkets. Under this program, random samples of produce items are taken weekly and tested for a limited number of chemicals.²³

Offered first in California, the number of subscribers has grown and the program has spread eastward.²⁴ It appears from trade press accounts that most participants in the Nutri Clean program are doing so not from a concern that their produce is unsafe, but from a perception that "pesticide-free" produce provides a marketing advantage.²⁵

Thus, the stores subscribing to the Nutri Clean service highlight their involvement with the program in varying ways in their communications with consumers. Some have been more aggressive than others, advertising "safer" produce than their competitors, or the only produce "certified pesticide free".²⁶

There is as yet little published evidence of the effectiveness of these promotional efforts. There is anecdotal evidence that at least some consumers are confused or even negatively influenced by the campaigns.²⁷ On the other hand, no one has yet dropped out of the program and additional chains are signing up to participate.

Marketing Implications of Private Testing

From a marketing standpoint, it seems obvious that the greatest advantage of the Nutri Clean program belongs to the first participating chain in a particular marketing area. However, to the extent the program is successful, competitive pressures will force the other stores in the area to join Nutri Clean or a similar program. As that happens, whatever competitive advantage there is from testing produce for pesticide residues will be diluted and ultimately lost.

It is extremely likely, though, that the testing program itself could not be dropped since consumers will have become accustomed to the assurance the program gives regarding the safety of produce. Given a choice between "safe" produce and doubtful produce, we can assume that the typical consumer will choose to be safe rather than sorry. This means that the chain will have added a cost it cannot eliminate, but the cost no longer brings with it the marketing advantage for which the cost was incurred.

Focusing on the safety of produce may well create within consumers a fundamental concern over the inherent safety of the product which test results will not assuage. Moreover, posting of the test results for fresh produce may well lead to consumer concern over the pesticide residue content of other foods, such as processed or packaged products. This in turn could lead to insistence upon residue-testing for packaged foods.

This might create another version of the scenario just described - a temporary advantage for the first processed products to trumpet their safety which would quickly disappear as more and more products were compelled to prove and publicize their safety. Once begun, ending publicized safety tests would be extraordinarily difficult.

The testing program would end by creating no marketing advantage. The processors would be saddled with increased and ongoing costs for testing, while there would be a diminution of consumer confidence in the food supply.

On the other hand, it could be that there is only a limited demand for produce tested for pesticide residues. In that case, those stores who test would fill a niche, leaving other markets to compete over price and other aspects of quality. Niche marketing is nothing new for supermarketing. Today conventional supermarkets coexist, albeit somewhat uneasily, with warehouse price stores, convenience stores, wholesale clubs, and upscale gourmet markets. Each appeals to a different segment of the populace. Just as there are always customers for full-service gasoline stations, notwithstanding the lower prices at the self-service pumps, some consumers would rather shop where product safety is perceived higher, even if more expensive.

Legal Implications of Private Testing

In addition to its impact on marketing, a decision by a retailer on whether or not he will retain a private testing service to test for pesticide residues on fresh produce has legal implications as well. As we shall see, participation in a private testing program probably increases the legal risks for a retailer slightly. At the present time, however, legal reasons ought not be the determining factor in the decision to test produce or not.

The position of all the federal government regulatory agencies, EPA, FDA, and USDA, is that existing government programs are adequate to keep food products containing potentially dangerous pesticides off the market. Moreover, those same government testing programs clearly demonstrate that the food supply is not contaminated with pesticide residue. From this point of view, the public needs to be assured that pesticide residues on food are within government set tolerances, not that the food is 100% free of all residue.

The marketing of produce, therefore, as "tested pesticide free" could be viewed as a claim, which even if true, is irrelevant to the safety of the product. If consumers are induced into purchasing the product because they believe that the pesticide free produce is safer than the produce which is within tolerance, they have been misled. FDA could prosecute the seller for misbranding. Similar claims have been challenged by the FDA.

Thus, for example, a product that touted its vitamin content was misbranded with the court accepted FDA's contention that there was no nutritional use for rutin, bioflavonoid, sulfur, royal jelly, and other substances. Hence, it was misleading to label their presence.²⁸

Similarly, products represented as containing vitamin B-15 were found to be misbranded, because there is no scientifically recognized vitamin B-15.²⁹

On the other hand, it is clear that today's consumers are concerned about the safety of the food supply in general, and about pesticide residues on food in particular. Consumer surveys conducted for the Food Marketing

Institute confirm the depth of this concern. The vivid reaction to the "60 Minutes" programs about ALAR on apples, and indeed, the rapid growth of private testing programs also testify to a sincere consumer concern over pesticide residues on food.

Moreover, the FDA is considering supplementing its official sampling program with data from private testing programs. In that context, so long as the claims for privately tested produce are not outrageous, FDA might well choose to exercise its prosecutorial discretion and refrain from challenging such marketing.

The Agency has been following such a course with respect to certain health claims for food products. Although the consumption of one oat bran muffin has an insignificant impact on one's cholesterol level, the FDA is permitting label claims of "high in fiber" or "cholesterol free" on these products. It is doing so because health-conscious consumers want this information.

Marketing of its produce as "certified pesticide free" by a store may well constitute an "express warranty". Therefore, the store could be held liable if it nonetheless sold produce containing pesticide residues.

It is not necessary to use the word "warranty" or "guarantee" to create an express warranty. The courts will infer a warranty from the normal meaning of the language used. Certainly, the use of the word "certified" conveys a warranty-like meaning.

Thus, for example, a statement that "the use of rustproof linings in the cans would prevent discoloration and adulteration" was held to constitute an express warranty.³⁰ Similarly, representations that a truck would provide long and reliable service at low maintenance costs was held to be an express warranty.³¹

The claim that a store's produce is "certified pesticide-free" in all probability, therefore, constitutes an express warranty for which the store might be held liable. Even a simple pronouncement of "pesticide-free produce" could lead to the same result. As one court put it, "if a dealer does inspect or test its merchandise, it must do so non-negligently . . . [H]aving made . . . [tests, the retailer] would be liable for any patent defect which the inspections might reveal and could be negligent for not discovering such defects as might reasonably have been unearthed."³²

Although there is a threat of liability from a private action to a store for its marketing of pesticide free produce should it be found to be less than pesticide free, the danger to the store is probably minimal. If an individual sued the store simply because the produce was retested and found to contain some residues, the damage to the individual bringing the suit is unlikely to be more than the cost of the produce.

Produce is bought to be eaten, not to be retested. Once it is consumed, it is no longer available for testing. In addition, the principal concerns over pesticide residues relate to their potential carcinogenic, mutagenic, or teratogenic effects. These effects do not appear immediately, but typically take years to manifest themselves.

It would be very difficult, perhaps impossible, to establish that produce from a particular store many years

before had caused an individual's cancer. Therefore, the possibility of a store being assessed damages because of produce erroneously marketed as pesticide free is practically remote.

Another aspect of private pesticide testing that has possible legal significance is its potential impact on the legal standard of care required in the marketplace. A defendant in a civil trial for negligence must show that his actions were at least what an ordinary and reasonable person would have done in similar circumstances to avoid liability.

Before the on-set of private testing programs, a store could almost certainly meet the "reasonable person" test by relying on the government testing programs.³³ However, as private testing programs proliferate, it is more likely that a court would find that the standards of the community have risen. In the future, a store may well be held to a standard of care that requires private testing of produce in addition to those tests conducted by government.

For the reasons outlined above regarding the difficulty of tying an injury or death to pesticide containing produce, it is unlikely that the rise in the standard of care will significantly increase the risk of an adverse judgment to stores.

The growth of private pesticide testing does have legal implications. However, at this point, it does not appear as if legal reasons should be the determining factor in deciding whether or not to institute a testing program.

Conclusion

There is today a great concern over the safety of our food supply. There is no consensus on whether there is any basis for the concern. Nonetheless, one response to food safety fear has been the development of private testing services, in addition to government testing, to sample produce and assure that it is free of pesticide residues.

These private testing services are gaining in popularity as more chains sense a marketing advantage in promoting pesticide-free produce. As we have seen, however, that advantage may be short lived. If it is a significant advantage, the other factors in the marketplace will be forced by competitive pressure to adopt similar programs.

The end result will be an added cost, with no competitive advantage. Legal risks to participating stores will also increase marginally, although probably not significantly. Meanwhile, the consumers' perception of fundamental lack of safety in the food supply will be reinforced as stores compete with each other by advertising their own safety. This may well be the most unfortunate result of all.

END NOTES

1. Mr. Brown is a partner in the Washington D.C. law firm of Kirkpatrick & Lockhart, specializing in food and drug law.
2. Thus for example, ethylene dibromide is useful in controlling the fruit fly. When misapplied, however, it can, and has, poisoned municipal water supplies.

3. See Pesticides: A Consumer's Guide to Safer Use, EPA Journal, May, 1987, p. 10.
4. With respect to pesticide residues, the Department of Agriculture is responsible for regulating the safety of meat and poultry, 21 U.S.C. §§453(g), 601(m). This paper focuses on pesticide residues on fresh produce, regulated by the FDA. Food Drug & Cosmetic Act (hereafter FDCA) §408, 409, 21 U.S.C. §§346a, 348.
5. 7 U.S.C. §135a(a).
6. 7 U.S.C. §135a(c) (2) (A).
7. FDCA §408(a), 21 U.S.C. §346a(a).
8. Note 4 supra.
9. In 1984, some states took action to ban products containing ethylene dibromide (EDB); in 1986 it was daminozide (ALAR).
10. U.S. Food & Drug Administration, The FDA Pesticide Program, March 1988 Draft, at 3 (hereafter FDA Report).
11. See e.g., "Pesticide Protection," Newsweek, Nov. 9, 1987, p. 71.
12. FDA Report at 3.
13. "FDA Reports Low Residue Levels in Food", Supermarket News, December 12, 1988, p. 1.
14. Food Chemical News, Nov. 28, 1988, p. 9.
15. "Testing, Testing" Washington Post, E1 September 28, 1988.
16. See Supermarket News, April 11, 1988, p. 1.
17. FDA Report at i; Supermarket News, September 5, 1988, p. 1.
18. See Farley, Setting Safe Limits on Pesticide Residues, FDA Consumer 8 (Oct. 1988).
19. "Testing, Testing" Washington Post, E1 September 28, 1988.
20. E.g. "Cuomo May Pull Grain Products Off Shelves Till State EDB Rules are Met" NY Times, B1, Feb. 8, 1984.
21. E.g., "Additives in Food a Concern" NY times, A48, May 24, 1986.
22. Cal. Health & Safety Code §25249.5 et seq.
23. "Testing, Testing" Washington Post, E1 September 28, 1988.
24. Id.
25. "Testing, Testing" Washington Post, E1 September 28, 1988.
26. See Pesticides Turn Pesky - Advertising Age S-6, October 3, 1988.
27. "Consumers React to Monitoring Program," Washington Post, E6, September 28, 1988.
28. U.S. v Vitasafe Formula M, 226 F. Supp. 266 (D.N.J. 1964), reversed on other grounds 345 F. 2d 864 (3d Cir.) cert denied 382 U.S. 518 (1965).
29. U.S. vs Aangamik 15 Calcium Pangamate, 505 F. Supp 925 (N.D. Ill. 1980); aff'd 678 F. 2d 735 (7th Cir. 1982).
30. Rhodes Pharmaceutical Co. v Continental Can Co., 72 Ill. App. 2d 362, 364, 219 N.E. 2d 726, 728 (1966).
31. Springs Motor Distributors, Inc. v Ford Motor Co., 465 A. 3d 530 (N.J. 1983). See also Slyman v Pickwick Farms, 14 Ohio App. 3d 25, 472 N.E. 2d 380 (1984).
32. Holman Motor Co. v Evans, 314 S.E. 2d 453, 456 (Ga. 1984).
33. Chapman v Pfarr, 145 Iowa 196, 123 N.W. 992 (1909).

For more information please contact Gina Resnick, Jaffe Assoc., 1703 Rhode Island Ave., N.W., suite 200, Washington, D.C. 20036.

Coping With The Food Fright

by Joan Murray, R.D.

Alar is on its way out of the apple-production process, even though the Environmental Protection Agency (EPA) continues to claim Alar poses no grave health risk. "Growers 'don't have a prayer' of selling alar apples to processors," says Larry Davenport, executive director of the Processed Apples Institute. Public pressure and consumer concern turned the tide on the question of Alar risk, proving once again that an industry must be prepared for a quick response when a crisis occurs or the resolution will be outside of its reach.

In March of this year, the American public was confronted with two food scares - the contamination of Chilean grapes with cyanide and the *60 Minutes* report on the Alar content in apples. Both incidents brought to mind a chilling concern about the safety of the food supply and resulted in millions of dollars of lost revenue and in extensive litigation.

A look at the Alar incident shows how quickly panic can set in when the public is confronted with a question of food safety. Alar has been around for 20 years (since 1967), used on apples as a growth regulator. It reduced the number of apples that dropped from the tree and made a uniform product in terms of size, color and firmness. Alar extended the apple's shelf life up to six months.

In 1985 scientists at the Environmental Protection Agency (EPA) completed routine review tests of Alar, which suggested that the substance may not be as safe as once believed. EPA submitted the data to an independent science advisory panel for review, which rejected that data as being flawed.

EPA then ordered Uniroyal, the maker of Alar, to conduct studies on the safety of the product. These studies, which are still in progress, will not be completed until January 1990.

In 1986 the Natural Resource Defense Council (NRDC), a private organization in Washington DC, took up the Alar fight and filed a complaint with EPA, questioning the safety of Alar. In 1987, NRDC filed a lawsuit, seeking to have EPA immediately ban the use of Alar on apples. The judge in the case denied the injunction to ban Alar on procedural grounds. After losing the injunction in 1988, NRDC began to release information to the news media on the alleged dangers of Alar.

60 Minutes aired a pesticide-residue report based on NRDC information. This data had been previously rejected as flawed by EPA's independent science advisory panel and a computer model of the "baddest of the bad" case scenarios. The report concluded that the residue levels of Alar in apples caused an increased risk of cancer in children due to that population's higher metabolic rate and high consumption of apple juice. The residue levels,

from an analysis performed by *Consumer Reports*, were 1/40th of the legally allowed limit of 20 parts per million.

"In order for a child to be at risk of cancer, using the analysis of the apples cited in the *60 Minutes* report, the individual would need to consume 1,800 quarts of apple juice every day for 70 years," reports Anne Barker-Smith, food technologist with Pocahontas Foods USA, a Richmond, Virginia, food distributor. "In my opinion, that individual would drown from the fluid intake or die from malnutrition before he would show any signs of cancer."

Despite EPA's and processors' assurances - both the EPA and the FDA have testified before congressional committees that there were no immediate risks with Alar - public panic quickly grew, and pressure was placed on legislators and growers to ban Alar.

Rep. Henry Waxman (D-CA) and Sen. Ted Kennedy (D-MA) have introduced bills to adopt new risk-assessment standards for pesticide residues. Sen. John Warner (R-VA) has introduced legislation to remove Alar from the market. His position is that the current regulatory process is too slow in removing what is perceived to be a dangerous product, and the consumer perception of risk is damaging to the apple-growing industry.

In California, legislation has been introduced that will require growers to keep records on all pesticides and quantities used. The bill will also require more inspection by the state's department of agriculture and include more tests for pesticide residues.

The Food Industry's Response

"If the risk of cancer were as high as the Natural Resource Defense Council claims, then the projected cancer rate would now be seen in the cancer statistics, as many of the current pesticides that are in use today have been in use since the 1950s and 1960s," says Jill Snowdon, director of technical affairs for the United Fresh Fruit and Vegetable Association in Alexandria, Virginia.

Nonetheless, almost immediately, food processors had to reassure their distributors that the Alar residue content of their product was well within the legal limits. Many food distributors, such as Pocahontas Foods USA, requested documentation on the residue levels of the apple products, along with letters of guarantee. In the wake of the Alar controversy, Pocahontas Foods sent letters to customers reassuring them of the safety of the foods sold to them. Some of their customers sent samples out for testing to an independent lab to confirm the reports supplied to them by Pocahontas. Levy Restaurants in Chicago, for example, talked with purveyors before deciding not to remove apples and apple products from its menus.

But even this was not enough. Pressure is mounting to ban Alar as a pesticide residue, and some observers predict that the ban will be in effect in the spring of 1990. Many growers have already imposed a voluntary ban on Alar, but at a price. The cost of apples will increase 25 to 30 percent this year alone. In addition, apples face an image problem that the International Apple Institute must combat with an aggressive education program and advertising.

According to Snowden, "The activists have manipulated the perception of food as being unsafe. The overriding social ramification is that the hysteria created masquerades as social well-being, and public policy will be made on an emotional basis, rather than a logical conclusion to solid, scientific data."

What Restaurateurs Are Doing

Restaurateurs rely on documentation to ensure food safety. "We know who is handling our food every step along the way," reports Bill Easby-Smith, managing partner of Chesapeake Bay Seafood House in Vienna, Virginia. "Our managers look for spoilage and for anything unusual. If they find something unusual, they call and alert our other units and headquarters. We buy from reputable vendors. We have an approved list of vendors who must meet our levels of sanitation and quality."

"When we are taking on a new supplier, we inspect their facilities for sanitation," says Bill Post, executive vice president of operations for Levy Restaurants in Chicago.

"Although food suppliers can do everything possible to ensure that a product is, in fact, safe, they can never completely eliminate the potential risk of harm to the public. Instead, the supplier is likely to balance the risk of harm with the cost and feasibility of substantially minimizing that risk," says Francis A. Citera, an attorney with the law firm of Phelan, Pope and John in Chicago.

But taking precautions may not be enough. Some observers believe a crisis plan should be in place in every organization.

Coping With A Crisis

"What the food industry as a whole needs to do is figure out a plan ahead of time to deal with a crisis, regardless of the cause, whether it be a foodborne illness or pesticide contamination," maintains Al Tortorella, executive vice president and director of crisis management at Burson-Marsteller in Los Angeles, California. "The single most important thing is how well the primary episode is contained." When a crisis occurs, there is little time to gather the facts. The average time in which to have a response in action is approximately three hours after the initial notice. The object in a crisis situation is to gain control as much as possible and be perceived by the public as being in control.

"The media will ask two basic questions: What are you going to do about the problem? When and what did

you know?," Tortorella continues. "The media wants to give the public answers and to reassure them of their safety and well-being."

"What a company should do when the press comes is to acknowledge the problem and present an action plan of what will be done until the problem is solved," emphasizes Tortorella. "Most restaurants concern themselves about the technical issues, such as sample collection and testing, and not communicating effectively to the public."

Establishing Principles

The first step in creating a crisis-communications plan is to anticipate and plan. Establish policies, principles and goals in writing and designate a crisis team or company spokesperson.

A restaurant should take the initiative in disseminating information. The restaurant's best interests are served by adopting a policy of full disclosure. By disseminating the information quickly, the restaurateur will demonstrate his or her concern and will maintain control of the crisis. By getting the facts out quickly, the spokesperson can stop rumors and provide reassurance to the public that every possible step is being taken to resolve the crisis. In general, the more responsive an operator is to the press, the more positively his or her restaurant will be perceived by the people in the community. When the press believes that a restaurateur is being less than candid, it will seek out information elsewhere.

The importance of being truthful cannot be overemphasized. An operator's credibility before employees, the press and the public can be destroyed by one lie, misrepresentation or intentional failure to disclose relevant information.

For example, when a Levy restaurant became the focal point of a foodborne illness outbreak in 1985, the company quickly put a carefully thought-out plan into action. It included closing down the establishment, expressing concern about the victims - both to the press and to the individuals involved - and reimbursing affected patrons for their meals, medical bills and lost wages. Not only did the Levy organization win public support for its quick response, but it was also found not to be negligent in its practices by health officials.

Talk To Your Staff

Finally, the successful crisis-management plan needs the support of all employees. If you keep them informed on a regular basis, you can help them overcome their feelings of helplessness and frustration and could ensure cooperation at a time when it is needed most. In addition, a restaurant's employees inevitably talk to a large circle of family and friends. Keeping everyone informed ensures that the operation will provide consistent information.

Reprinted from Restaurants USA, Vol. 9 #8 Sept. 1989.

The Scientists Tell Me . . .

Integrated Pest Management Systems Protect Environment and Boost Profits

By Robert L. Haney
TAES Science Writer

Integrated Pest Management Systems, called IPM, control pests such as insects, weeds, and disease that injure our plant crops.

IPM was first devised as a strategy in orchard crops to combine chemical and biological control, and later, to control insects in row crops when insect resistance to chemical insecticides developed.

Technology Expands

Still later, this technology was expanded to pests attacking other horticultural crops and live-stock.

For 20 years, the IPM approach has played a major role in reducing the damaging effects of pesticides on people, ground water, and wildlife. In recent years, the principles of IPM have been used to develop excellent pest control programs for structures and landscapes in urban areas.

Integrated pest management coordinates and integrates all biological and nonbiological methods of control of an insect, weed, or disease. It uses pesticides sparingly, and only when economic conditions dictate.

Reduces Exposure

Consequently, IPM has played and will continue to play a major role in reducing or eliminating pesticide exposure to humans, contamination of the environment, and pesticide threats to endangered species. The concept has proven to have economic advantages for agricultural producers, according to Dr. Raymond E. Frisbie, Professor and Extension IPM Coordinator for Texas.

Advanced IPM systems can factor in nearly all the variables in crop or livestock production. In developing an overall pest management plan, Frisbie suggests consideration of these tactics:

- Use pest-resistant plant varieties, adapted locally from disease-free stocks.
- Adopt farming practices that discourage pest development, such as carefully planned planting and harvesting dates, cultivation techniques, water and fertilization management schemes, and destruction of pest-harboring crop residues.

Natural Enemies

- Introduce pests' natural enemies into the production system, such as parasites, predators, pathogens (that cause insect disease), or competitors for food.
- Use crop/pest models and environmental monitoring to predict pest occurrence.
- Monitor levels and types of pest infestations.
- Develop economic thresholds, at which damage by pests is economically significant and warrants pesticide application.
- Select and time the application of the most environmentally safe pesticides, when economic thresholds are reached.
- Periodically evaluate the economic, environmental, and social benefits of pest management.
- Regularly contact your local Cooperative Extension Service for the latest information about IPM techniques.

A good example of the benefits derived from use of IPM in cotton in one region of Texas was cited by Frisbie. Coordinated by the Texas Agricultural Extension Service, a regional cotton production program in the environmentally sensitive, lower Rio Grande valley uses a range of IPM tactics.

Cultural Control

The program is applied to 450,000 acres and has emphasized cultural rather than chemical methods of boll weevil control to increase profits by \$31 million per year and reduce insecticide use by an estimated 650,000 pounds per year.

Cotton IPM programs in other regions of the State have saved Texas farmers \$8.43 billion by decreasing expenditures on pesticides and increasing yields.

Research Base

The IPM programs were developed from research done by the Texas Agricultural Experiment Station, other Stations, and USDA, Frisbie said. Among the strategies farmers have used to accomplish these results are:

- Short-season, pest-resistant varieties;
- Optimal planting dates;
- Pest simulation models;
- Detailed season-long monitoring of pest populations and plant conditions;
- Pesticide selection and timing of applications, based on monitoring results and economic thresholds;
- Preservation of natural enemies of pests; and
- Harvesting early and destroying plant residue to remove pest harborage.

Integrated pest management makes good economic sense, Frisbie said. By 1987, an evaluation of IPM programs in 15 states documented that IPM users overwhelmingly showed a profit, while reducing the use of pesticides.

Profits Increase

In these states, farmers using IPM increased their net profits over non-IPM users by an estimated \$578 million per year. The evaluation estimated that private pest-management consulting firms may bring in revenues exceeding \$400 million per year.

It is easy to understand why IPM programs have continued to be emphasized by many Cooperative Extension Services despite constantly diminishing federal financial support, Frisbie concluded.

Editor's Note: Any question regarding this column should be addressed to Science Writer, Department of Agricultural Communications, Texas A&M University, college Station, Texas 77843.

LISTERIA • SALMONELLA
COLIFORMS • PSYCHROTROPHIC BACTERIA

Take action against contamination

The QMI Tru-Test™ aseptic sampling system is a unique, patented aseptic sampling system that, when combined with proper laboratory procedures, can help you:

- Identify sources of contamination quickly, accurately and economically.
- Accurately monitor sources of microbial contamination.
- Avoid the disaster of contaminated products.

Don't take chances! Take action against contamination. For more information, contact:

QMI TRU-TEST™ ASEPTIC SAMPLING SYSTEMS*

QMI FOOD & DAIRY QUALITY
MANAGEMENT, INC.

245 E. Sixth Street
St. Paul, MN 55101
(612) 228-0474



*Manufactured for Food and Dairy Quality Management, Inc., under license from Galloway Trusts, Neenah, Wisconsin. U.S. Patent No. 3,779,082. Canadian Patent No. 975,401. Patented 1975.

Please circle No. 144 on your Reader Service Card

News

CAST Comments on Bovine Somatotropin (BST)

No scientific evidence exists that humans are at risk in consuming milk from BST-supplemented cows. This is the conclusion of scientists representing seven pertinent societies within the Council for Agricultural Science and Technology (CAST). Dairy, animal, meat, food, veterinary medical, regulatory, and toxicology scientists agree that consumers may drink the milk from BST-supplemented cows without question or concern over its safety. The Food and Drug Administration, the U.S. Department of Agriculture, scientists from dozens of universities, and years of research support this conclusion.

Bovine somatotropin (BST), also known as bovine growth hormone (BGH), is produced by the pituitary gland. BST is involved naturally in the regulation of the flow of nutrients into the udder to support lactation. Thus, administration of BST to dairy cows to increase the efficiency of milk production mimics a natural process and has no impact on the wholesomeness of meat or milk.

BST is a normal constituent of the protein in milk, always present in very small quantities. There is no significant difference in the amount of BST in milk from supplemented and nonsupplemented animals. Since BST is a protein, it is digested like any other dietary protein and thus destroyed in the gastrointestinal tract of humans.

Tests on the effects of somatotropin in dairy cows are not new. The hormone was first found to increase growth and milk production in the 1930s. During World War II when food was scarce, the British tried to use BST to increase food production. However, the need for several pituitaries to inject one cow for one day was an insurmountable limitation. Because of this obstacle, the use of BST was out of the question until the 1980s, when recombinant DNA techniques made it possible to produce the hormone relatively efficiently.

Bovine somatotropin improves feed efficiency by 5 to 15 percent, and milk production by 10 to 25 percent. Those who would halt the use of BST have argued that more research is needed to measure the effect of the hormone on the animal itself. Extensive research on this and related issues has been done. The overall effect in reproduction is defined as a slight delay in breeding back after lactation, which is commonly observed in high-producing dairy cows.

One of the other physiological effects of BST is its potential impact on summer milk production, which decreases with elevated temperatures. University researchers have shown that dairy animals held at temperatures approaching 100°F had significantly greater milk production if treated regularly with the hormone.

CAST scientists represented by this summary statement are convinced that BST research should continue unhampered. The decision by major supermarket chains to halt the sale of milk from cows receiving

somatotropin may have arisen from their concern for the public's perception of food safety. This action, however, is not based on scientific fact, and will result in the disposal of a safe food, or its diversion into animal feed.

The interruption of BST research, or even the withdrawal of milk from cows supplemented with BST from the market has the potential of seriously impairing biotechnology research. This would set a dangerous precedent, and could result in an inadequate supply of high quality food for consumers both here and elsewhere in the world.

For more information contact Robert G. Zimbelman, (301) 571-1875, or William W. Marion, (515) 292-2125.

Spectrochrom, Ltd. Tests For Toxins With Its Quick Kits

The drought hit Iowa hard in the summer of 1988 and caused a variety of problems for farmers; one problem is the level of aflatoxins showing up in Iowa corn. But for Spectrochrom, Ltd., an ISIS tenant company which provides kits and tests for this and other dangerous toxins, the drought has caused an increase in demand for their products.

Spectrochrom, Ltd. designs and manufactures diagnostic test kits for use by grain producers, elevator operators, food producers and animal raisers.

Mycotoxins, more commonly known as mold, come in a variety of forms and develop under a variety of conditions. Aflatoxin is produced by a common mold, *Aspergillus flavus*, which attacks corn that has been weakened by drought or insects. The government requires the testing of this toxin which causes cancer in humans and liver damage in animals.

Spectrochrom, Ltd. Quick Kits can track the presence of five toxins in livestock feed. The kits provide a quick, reliable and inexpensive way to test grains. The convenience of the Quick Kit lies in the fact that testing can be done outside the laboratory environment with results in an hour for four samples.

Another benefit of the Quick Kit is it can test all five prevalent mycotoxins at once. Aflatoxin usually forms on damp stored Iowa corn in the fall and can cause feeding difficulties. Zearalenone is not technically a toxin, but is used as a growth hormone in male cattle. It is caused by condensation in wet corn. Ochratoxin destroys the kidneys of hogs and cattle and also ruins the liver. This toxin forms on the crusty top of silage and on wet corn which has been stored outside. Vomitin makes animals vomit and go off feed. It also forms in wet, moldy corn. T-2 toxin forms on damp grain during cold weather and causes vomiting and irritation around the mouth of livestock.

Spectrochrom also designs variations of this kit, one which tests the presence of sulfa drugs and another which tests for pesticides in feed.

Spectrochrom, Ltd., an Iowa State Innovation System company has grown a great deal and has moved into new facilities at the Iowa State University Research Park.

Spectrochrom was formed to assist Iowa agriculture in residue control by developing and marketing field Quick Kits for rapid inexpensive field testing. Laboratory services are also available for tests not available in Quick Kit form. They currently have several new projects in the product-development stage. These products are geared toward the consumer and are much easier and inexpensive to use. These consumer-oriented products will test for pesticides and residues on items such as lettuce.

For more information contact Iowa State University Research Park, 2501 N. Loop Drive, Ames, IA 50010-8283, phone number (515) 296-9913.

Fundamentals of Microwave Technology - A University Extension Short Course

Microwaveable products are the fastest growing food category in the United States - and over 60% of all homes are equipped with microwave ovens. Despite this, very few food scientists have received formal training in microwave power and its application in the food industry because most food science departments have not offered courses in microwave technology. In order to meet this training need, University Extension at UC Davis is offering **Fundamentals of Microwave Technology**, Monday, January 29, 9:00 a.m. - 9:30 p.m., and Tuesday, January 30, 8:00 a.m. - 5:00 p.m., at the University Club on the UC Davis campus.

This intensive two-day program provides an excellent introduction to microwave theory for any food scientists who are developing and packaging microwaveable products. It features lectures by UC Davis food scientists and Dr. Robert Schiffmann, a noted microwave power researcher who has authored many articles on microwave application for product development in the food industry.

The program is designed to explain microwave energy and its application to food technology. It starts with a review of how microwave power is harnessed and reviews microwave systems, dielectrics (how foods respond to microwaves), power absorption and commercial use of microwave power in food processing. The second day emphasizes product development and consumer response to microwaveable products, including a review of the differences in microwave ovens, formulating foods for home ovens, product testing, and packaging design including a discussion of susceptors and modified atmosphere packaging.

The enrollment fee of \$375 includes two lunches and one dinner. For more information or to enroll by phone, please call (800) 752-0881. Davis and Dixon residents should call (916) 757-8777.

National Restaurant Association To Sponsor First National Symposium On Solid Waste

In recognition of the growing crisis in solid waste and the need for a resolution to the problem, the National Restaurant Association is sponsoring a one-day symposium to explore the foodservice industry's role in the current and future challenges of solid waste management.

The symposium, entitled "Managing Solid Waste: Answers for the Foodservice Operator," will be held on Tuesday, January 9, 1990, at the J.W. Marriott Hotel in Washington, DC. The meeting marks the first time that industry operators and suppliers, state and local government representatives, and experts on the topic of solid waste will come together specifically to discuss this increasingly pressing environmental issue.

"The solid waste problem is one of the most visible issues affecting the foodservice industry today," said association President Harris H. "Bud" Rusitzky. "Even though industry packaging accounts for less than one-third of one percent of the nation's solid waste, the general public believes our contribution to be much greater.

"Through this symposium, we hope to bring legislators, media and the public at large the true facts about the industry's role in the solid waste problem. At the same time, we hope to develop voluntary programs to manage effectively the small amount of industry-generated waste and perhaps to make an impact on the larger, overall solid waste problem as well," Rusitzky said.

At the symposium, panels of operators, legislators and solid waste experts will discuss a wide range of topics, including: a national overview of the solid waste situation; a review of state and local conditions; a discussion of disposal alternatives, including recycling and energy recovery; a look at state-of-the-art supplier innovations; and operator case studies, outlining real-life solid waste management situations. Attendees are encouraged to bring their own experiences for discussion and review during the extensive question-and-answer periods following each panel presentation.

Registration for the National Restaurant Association's Symposium on Solid Waste Management is \$65 per person. To register, contact the association's technical services department at 800/424-5156 or 202/331-5900; or write to the National Restaurant Association, Symposium on Solid Waste Management, 1200 Seventeenth St., NW, Washington, DC, 20036.

Press registrants should contact Anne Papa, manager of media relations, at 202/331-5938. Press registration to the symposium is complimentary.

Food Supply Protection Food Testing Program Monitors Residues

Is our food supply safe? Contrary to some of the alarms sounded recently, Food and Drug Administration (FDA) testing shows that it is.

"Most consumers are confused about pesticide residues in both the domestic and imported food supply," said Dr. Mary Kinney Sweeten, nutrition specialist with the Texas Agricultural Extension Service.

The FDA samples individual lots of both imported and domestically grown foods and analyzes them for pesticide residues.

When residue levels are in violation of Environmental Protection Agency standards, domestic foods face sanctions such as seizure or injunction. Import foods may be detained at the port of entry.

To improve its system of testing and to watch for possible problems from certain foods or areas, the FDA works with state authorities on cooperative sampling plans and information exchanges, said Sweeten.

"The FDA is supporting a system to compile and summarize data on foods analyzed by states for pesticides and industrial chemicals known as 'Food-contam,'" she said.

Other approaches the FDA takes to food safety is the Total Diet Study, also known as the Market Basket Study. For this program, FDA personnel purchase foods from local supermarkets just as a shopper would.

This quarterly study uses composite samples of foods collected in three cities in a particular region. The groceries are then prepared as the consumer might, and then tested for residues.

For example, apples would be made into an apple pie and then the pie is tested, the Extension specialist said.

The primary purpose of the Total Diet Study is to compare dietary intake information on pesticides with the acceptable daily intakes (ADIs) established by the Food and Agriculture Organization of the United Nations.

"The comparisons show that the dietary intakes of pesticide residues are consistently below established ADIs, in most cases by a wide margin," Sweeten said. "For almost all pesticides, the dietary intake is less than 1 percent of the ADI."

For more information contact Dr. Mary Kinney Sweeten, (409) 845-1735.

Dietary Managers Conference Earns High Marks From Attendees

Dietary Managers Association's 29th Annual Meeting was a resounding success! More than 1,000 dietary

managers - including 200 "first-timers" - attended the August event in Nashville, TN.

"All the functions were great and all the speaker sessions I attended were very good to excellent," remarked one of many attendees who gave the meeting high marks.

Educational topics ran the gamut from "Meal Planning for Alzheimers Patients" to "Marketing Your Dining Services" - and everything in-between. Industry publication editors debated "The Future of Healthcare Administration and the Foodservice Industry" in a thought-provoking interactive session. (For the complete educational program lineup, please contact DMA headquarters.)

Seventy-two booths, representing over 50 foodservice-related companies, lined the Expo hall. Attendees previewed the newest products on the market and learned more about emerging technology. Exhibitors were pleased with the number of attendees and the buying power they have in their workplace. Testimony to the event's success, 35 companies have already reserved space for the 1990 Expo. Suppliers supported the annual meeting off the show floor as well, sponsoring meals, refreshment breaks, sessions, giveaways and registration materials.

Social activities were also plentiful. Highlighting the social agenda was country music superstar Louise Mandrell, who entertained the crowd on the final evening of the meeting.

DMA is moving "full speed ahead" on the 1990 Annual Meeting, scheduled for August 5-9 at the Hyatt Orlando in nearby Kissimmee, Florida.

DMA is a non-profit association serving more than 12,000 foodservice professionals throughout the United States.

For more information about DMA and its activities, please contact William St. John, Executive Director, Dietary Managers Association, 400 E. 22nd Street, Lombard, IL 60148, (312) 932-1444.

New Set Of Food Safe Series Tapes Added To Lending Library

A new set of Food Safe Series tapes has been added to the Lending Library for use by IAMFES members. This Series III contains case histories on (1) Hepatitis "A", a lapse in personal hygiene causes a three-week outbreak of hepatitis in New Jersey; (2) *Staphylococcus aureus* (meats), a cross-country train is the setting for this case history, which shows a Staph poisoning outbreak; (3) *Bacillus cereus*, several dishes at a Chinese smorgasbord cause numerous incidents of food poisoning; and (4) *Salmonella* (meat), guests at a wedding reception suffer *Salmonella* poisoning from tainted snacks.

For more information on the Food Safe Series III, contact Sandy at the IAMFES office, 800-525-5223 outside Iowa, or 515-232-6699 in Iowa.

Los Angeles Department Of Water And Power Hires ProTek Environmental For Toxic Soil Cleanup

ProTek Environmental, Inc. has won a contract granted by the Los Angeles Department of Water and Power to utilize its "active" biotreatment process to remediate approximately 800 cubic yards of dielectric fluid-contaminated soil. The contamination resulted from the explosion of two transformers.

Joseph Mathewson, president of ProTek, commented, "ProTek was selected over three other contractors due to our extensive and lengthy record of successfully completed projects. Our success with this project will enable the Department of Water and Power to evaluate bioremediation as a tool for future cleanup of dielectric fluid spills."

This program will reduce the current contamination level of 5600-7300 parts per million (ppm) to less than 100 ppm, which is the lead agency's requirement for reuse of the soil onsite. ProTek estimates a resulting cost savings of \$64,000 over the alternative method of offsite transportation and disposal.

ProTek's bioremediation process involves the use of Advanced BioCultures, micro-organisms specially formulated to "eat" the hazardous contaminants in both the soil and groundwater at the site.

ProTek Environmental, Inc. is a full-service environmental engineering contractor offering a complete "turn-key" site engineering and remediation service. ProTek specializes in the application of its own Advanced Bioremediation, Vapor Extraction and Chemical Fixation technologies to remediate sites where contaminated soils, sludges, and groundwaters are a problem. ProTek's staff of scientists and engineers are highly experienced in solving tough site remediation problems and have an excellent performance record in the field.

ProTek Environmental is based in Huntington Beach, California, with offices in Houston, Texas and Kansas City, Missouri.

For more information, contact Joseph Mathewson, ProTek Environmental, Inc., at 15243 Springdale Avenue, Huntington Beach, CA 92649, or call (714) 897-0781.

Miss Karen's Gourmet Frozen Yogurt To Be Distributed In Northwest

The Tom McClain Company, manufacturer of Miss Karen's Gourmet Frozen Yogurt, will begin distributing its product to the northwest United States.

The company plans to utilize Carnation Dairy of Portland to manufacture the base product for Miss Karen's Gourmet Frozen Yogurt.

"Using a regional dairy enables us to distribute the freshest possible product to our customers," said Tom McClain, founder and president of The Tom McClain Company. "Carnation Dairy of Portland has a reputation as one of the top Grade A dairies in the northwestern United States."

Miss Karen's Gourmet Frozen Yogurt will now be distributed to Washington, Oregon and northern California, according to McClain. Miss Karen's has also begun distribution to the New England area including New York, New Jersey and Maryland, now making Miss Karen's available in 48 states.

He explained that the base product for Miss Karen's Gourmet Frozen Yogurt is also manufactured in six other Grade A government inspected dairies strategically located throughout the United States and Canada. These distribution sites facilitate quick delivery and the freshness of the product. The dairies are located in Arizona, Texas, Tennessee, North Carolina, Pennsylvania and Canada.

Miss Karen's Gourmet Frozen Yogurt is available in an unflavored base yogurt mix in three formulas plus chocolate. Most recently, Miss Karen's introduced a nonfat yogurt formula to its product line. The new formula contains no fat and no cholesterol and has only 23 calories per ounce.

Miss Karen's Gourmet Frozen Yogurt is the number one retail frozen yogurt in Arizona. The product is available in 48 states and is served in more than 1,000 hospitals and in-plant cafeterias, making the Tom McClain Company one of the largest soft serve yogurt suppliers in the nation.

For more information contact Missy Lagomarsino (Martz & Associates), (602) 998-3154.

Negative Publicity Creates False Food Concerns Beef Industry Must Rebuild Confidence

"Perception becomes reality, irrespective of truth or scientific fact, when enough people perceive it," Dr. Gary Smith told beef producers and researchers at the Beef Industry Conference Aug. 14.

Media attention to cyanide residue on a few Chilean grapes, the Alar scare and the European Economic Community ban on imports of beef from animals implanted with hormones has increased the public's concerns about the safety of the U.S. food supply, he said.

This kind of negative publicity and media advertising has created some of the concerns of consumers, he added.

"In a survey of elderly women in Houston who had stopped eating red meat, 41 percent said they stopped because of what they read or heard in the media," Smith said.

A recent Burger King consumer trends report shows that 26 percent of U.S. population is eating less beef, and half of those say it is to improve their health, he added.

"To change consumer attitude and perception, we must use advertising, public relations and marketing," Smith said.

Beef belongs in the American diet only if it is safe, healthful, palatable and contemporary in calories, Smith said.

The industry must find a way to certify that beef is safe "in a way that people have confidence that their children and grandchildren can eat it," Smith said.

"Rep. Charles Stenholm has said that meat safety will be the issue of the 1990s," Smith said. "A survey by Food Marketing Institute has shown that of people who avoid certain foods because of safety concerns, one-fourth of them avoid meat and red meat," he added.

Consumers are most concerned about hormones, antibiotics, residues and pathogens, in that order, but scientists and other professionals would list their concerns in the reverse order, Smith said.

FDA Commissioner Frank Young has said that contamination by pathogens is much more important than pesticide contamination, Smith said.

"Some researchers rank food-borne disease second only to the common cold," Smith said. "One estimate places the number of cases each year at 5 million, with more than 9,000 deaths attributed to food-borne disease yearly. But much of the food-borne illness is related to poor handling by the consumer. FSIS of the USDA has blamed much of the problem on temperature abuse by consumers," he added.

Yet, the beef industry could further minimize food-borne illness by use of good manufacturing practices, bactericidal rinses and improving consumer education, Smith said.

"Additives are less risky. Studies have found no risk to consumers from use of antibiotics and anabolic steroids in the production of beef," Smith said.

A 1989 study by the National Academy of Science was unable to find any evidence implicating sub-therapeutic doses of antibiotic given to livestock and incidence of antibiotic-resistant strains of bacteria important in human illness," he said.

FDA guidelines on pesticide residues in the food supply provide a 100-fold margin of safety for humans,

he said. A FSIS-USDA report states that of 300,000 tests on 400 chemicals in foods in 1988, less than 1 percent of samples tested exceeded the FDA guidelines of safety, Smith said.

But a key factor in food safety that is overlooked by consumers is dosage, Smith said. "For example, turkey contains a carcinogen that could kill you, but you would have to eat 3.6 tons of turkey a day!"

The United States has developed a great agricultural system which provides an abundance of food at a relatively low cost, so other factors are now becoming a concern, Smith said. Quoting former Washington State Governor, Dixie Lee Ray, he added, the American people have become "the healthiest hypochondriacs in the world."

For more information contact Dr. G. C. Smith, (409) 845-1543.

Seafood's Top 10 Announced

The top ten species of finfish and shellfish for 1988 were announced today by Lee J. Weddig, Executive Vice President of the National Fisheries Institute.

The top 10, according to consumption, were tuna (canned), shrimp, cod, pollock, flatfish (flounder/sole), clams, catfish, salmon, crabs and scallops. All 10 represent over 80% of the total per capita consumption, or 15.0 pounds per person (edible weight).

Compared to 1987 figures the top 4 - tuna, shrimp, cod and pollock, all increased in consumption slightly, while flatfish and clams decreased. The top ten species were computed from figures obtained from the 1988 edition of Fisheries of the U.S., a publication of the NOAA.

The National Fisheries Institute is the largest trade association representing the seafood industry.

For more information contact the Communications department, the National Fisheries Institute, 2000 M St., NW, Suite 580, Washington DC, 20036, (202) 296-3428.

Partially Hydrogenated Menhaden Oil Receives FDA GRAS Status

The National Fish Meal and Oil Association (NFMOA) today commended the U.S. Food and Drug Administration for granting Generally Recognized As Safe (GRAS) status for partially hydrogenated menhaden oil (PHMO) and called on the agency to speed approval of GRAS status for refined menhaden oil (RMO) as well.

"The long-awaited approval of GRAS status for partially hydrogenated menhaden oil is very welcome because it confirms our belief, based on substantial

scientific evidence as well as decades of experience in Europe, that menhaden oil is a safe, wholesome product," NFMOA Executive Director Lee Weddig said.

Produced exclusively in the United States, menhaden fish oil has long been exported to Europe, where it is used as cooking oil and in a variety of products, including margarine and baked goods. Because menhaden oil was not included on the FDA's original GRAS list, the NFMOA was compelled to initiate a year-long FDA petitioning process that included laboratory feeding trials to confirm the safety of the oil which was already well-established through experience in Europe.

Now that GRAS status has been granted for PHMO, Weddig called on the FDA to speed approval of GRAS status for RMO, especially since a study of scientific literature prepared by MITRE Corporation at FDA's request showed no health problems associated with human consumption of refined menhaden oil.

"The FDA originally indicated that NFMOA should undertake studies on PHMO because that was the more processed form of the product. Clearly the more natural form - RMO - merits GRAS status now that PHMO has been approved for human consumption," Weddig said. "While there is certainly interest in PHMO, it is RMO that is most eagerly awaited by both food manufacturers and consumers."

Several scientific conferences have examined the healthful benefits of the polyunsaturated fatty acids found in fish oil, especially the Omega-3 fatty acids, including eicosapentaenoic acid (EPA) and docosahexaenoic acid (DHA). A variety of studies suggest these fatty acids encourage reductions in triglycerides and low-density cholesterol and also produce anti-clotting effects. Refined menhaden oil contains relatively high levels of these polyunsaturated Omega-3 components while PHMO does not.

"In the light of the affirmation of GRAS status for PHMO and the findings of the MITRE Report, we can see no reason why approval of GRAS status for refined menhaden oil should not be shortly forthcoming," Weddig said.

The National Fish Meal and Oil Association is a trade association of U.S. fish meal and oil companies which promotes the utilization of high quality menhaden fishery products. The menhaden industry, the nation's largest fishery in terms of landings, operates along the Atlantic Coast and the Gulf of Mexico.

For more information contact the National Fisheries Institute, Communications Department, 2000 M Street, NW, Suite 580, Washington, DC 20036, (202) 296-3428.

Marth Receives Laboratorian Award

E.H. Marth, a food microbiologist at the University of Wisconsin-Madison, received the Laboratorian of the Year award at the annual meeting of the Wisconsin Laboratory Association.

Marth, a professor of food science, has contributed to four editions of Standard Methods for the Examination of Dairy Products, as well as to the second edition of the compendium of Methods for the Microbiological Examination of Foods.

He co-authored two laboratory manuals in microbiology, and wrote or co-wrote more than 500 scientific publications based on laboratory research.

Marth helped to develop methods for detecting aflatoxin M1, *Listeria monocytogenes*, and certain enzymes in bacteria. He edited the Journal of Food Protection from 1967 to 1987, and had trained numerous graduate students, most of whom now perform or supervise laboratory work.

The Wisconsin Laboratory Association was founded in 1976 to serve the needs of personnel in food, dairy and other non-clinical laboratories in Wisconsin.

In Memory of Bill Chappelow and George Briggs

The Ames Office has been notified of the following members who passed away in 1989. They will be greatly missed both in industry and the association.

Bill Chapelow of Duarte, CA and George Briggs of Lafayette, CA.



Northland Food Laboratory, Inc.

Analytical and Microbiological
Testing including Chemistry

Consulting and Sanitation Audits

Development of Hazard Analysis
Critical Control Point (HACCP)
Control Systems For Your Food Plant.

Research Projects — Challenge Studies,
Shelf-life and Raw Materials Testing.

1044 Parkview Road
Green Bay, WI 54304
414-336-7465

2415 Western Avenue
Manitowoc, WI 54220
414-682-7998

Please circle No. 215 on your Reader Service Card

Food and Environmental Hazards To Health

Occupational and Environmental Lead Poisoning Associated with Battery Repair Shops - Jamaica

In August 1987, Jamaican public health officials learned that 19 (86%) of 22 recently hospitalized children with lead poisoning in Kingston lived near small automobile-battery repair shops. Nine of these children had acute encephalopathy and seizures, and four were treated for recurrent symptoms of lead toxicity between January 1986 and March 1987. Because of the large number of severe cases and the unusual suspected exposure, the Jamaican Ministry of Health requested assistance from CDC in October 1987 to assess the prevalence and causes of excessive lead absorption among workers and household members exposed to battery repair shops.

At least 50 shops repair or rebuild car batteries in Jamaica; approximately 30 are located in Kingston. These shops typically employ one or two workers and share a yard with one or more residences. For evaluation of worksite exposures, 11 shops in Kingston were chosen for a survey (one shop was no longer in business, but the residential area was included in the study). For evaluation of exposure to airborne lead, seven air samples (three from breathing zones of individual workers and four from general work areas) were collected at each of the five shops that were repairing batteries on the day they were visited. Blood samples were drawn from workers at all 10 active shops. For evaluation of household exposures, 17 residences on repair-shop premises, including five in which repair-shop workers lived, and seven residences of repair-shop workers not on shop premises were identified. Eighteen neighborhood-matched control residences were also surveyed. At study residences, samples of soil and house dust and venous blood specimens from household members >6 months of age were analyzed for lead. Participants or their guardians were notified of elevated blood lead (PbB) levels and referred for medical evaluation if indicated.

Levels of exposure. Air-lead levels in repair shops averaged 0.021 mg/m³ (geometric mean), and one sample exceeded the U.S. Occupational Safety and Health Administration (OSHA) permissible exposure limit of 0.050 mg/m³. In contrast, potentially hazardous levels of lead in soil and house dust were common at residences on repair-shop premises, where 11 (85%) of 13 yards had soil-lead levels >500 ppm (range: 51-54,000 ppm), and 11 (73%) of 15 homes tested had dust-lead levels >1500 µg/m² (range: 190-62,800 µg/m²). These levels of lead in soil and house dust have been associated with increased lead absorption in children. Geometric mean soil- and dust-lead levels were significantly higher ($p<0.005$) at residences located on repair-shop premises than at control residences.

Levels of lead absorption. Blood samples were obtained from all 23 workers at the surveyed repair shops. The geometric mean PbB concentration was 64 µg/dL, and 18 workers (78%) had a PbB concentration of >50 µg/dL.

Blood samples were obtained from 186 (67%) of 279 study household members. Of 86 household members at repair-shop premises, 58 (67%) had PbB levels ≥ 25 µg/dL. The prevalence of persons with high levels decreased with increasing age: 0-5 years, 100%; 6-11 years, 94%; ≥ 12 years, 47%. Geometric mean PbB levels were lower among members of control households (<0.0005 , *t*-test), in which <10% of persons in each age group had PbB ≥ 25 µg/dL (maximum detected, 33 µg/dL). Among persons ≥ 6 years of age, PbB levels were higher in those who lived in worker households located away from repair-shop premises than in those from control households.

PbB levels in persons were strongly correlated with lead concentrations in soil and house dust. The correlation was strongest among children <6 years old ($r=0.72$ [$p<0.0001$] for soil lead and $r=0.55$ [$p=0.0002$] for dust lead). Two residences located on the premises of the closed repair shop were among those with elevated soil lead, and all three children <6 years of age who lived there had PbB ≥ 25 µg/dL (range: 48-65 µg/dL).

Editorial Note: Small-scale workplaces, which are common in developing countries may be located in or near homes, and often they lack measures to protect workers and nearby residents from hazardous exposures. Lead is sometimes used in "cottage" industries, and lead poisoning has occurred both in workers and in households members exposed to processes such as recycling car batteries, making lead type, tempering cutlery, and making pottery. Lead poisoning of household members from lead dust brought home on work clothes has also been reported from moderate-sized workplaces.

Adverse health effects of lead include acute and chronic central nervous system toxicity, peripheral neuropathy, impairment of hemoglobin synthesis and anemia, chronic renal disease, and impairment of male and female reproductive functions. Children are especially susceptible to lead neurotoxicity, and CDC guidelines for childhood lead screening recommend intervention when the PbB level is ≥ 25 µg/dL. PbB levels well below this screening threshold have been associated with impaired cognitive development in early life, especially when exposure occurs to the developing fetus.

Exposed workers absorb lead mainly by inhaling airborne lead particulate and, to a lesser extent, by unintentionally ingesting lead dust that has contaminated hands, food, or cigarettes. Most repair-shop workers in this survey had PbB levels that exceeded both the World Health Organi-

zation PbB limit for adult males (40 µg/dL) and the U.S. OSHA medical removal level (50 µg/dL averaged over 6 months). Because air-lead levels exceeded 0.05 mg/m³ at only one of five shops tested, ingestion may be an important route of exposure in repair-shop workers.

Persons living on the premises of battery repair shops appear to be at high risk for elevated PbB levels, and children are at risk for PbB levels sufficiently high (>50 µg/dL) to cause overt symptoms. The findings of this investigation are consistent with those of other studies indicating that ingestion of lead-contaminated soil and dust is an important route of lead exposure for children. Direct contamination of repair-shop premises by lead emissions from battery repair and by inappropriate handling of lead scrap appears to be a greater environmental hazard than lead dust carried on work clothes to homes distant from the repair shops.

Measures to control lead exposure in the workplace include providing controlled ventilation for processes that generate airborne lead dust and fume; wet sweeping or vacuuming to remove lead dust from environmental surfaces; avoiding eating or smoking in lead-contaminated areas; washing hands before eating or smoking; using proper respirators when air-lead levels cannot be reduced to safe levels; and showering and changing clothes before leaving work so that lead dust is not carried home. Workers at battery repair shops need to be informed of safe work practices. Although these measures may also reduce contamination of the home environment, their effectiveness in reducing household exposures in homes where lead work is done is not known. Soil contamination near shops using lead presents a continuing hazard unless the soil is removed or covered. Ideally, lead-related work should not be done on residential premises.

Small-scale battery repair shops have also been described in Nigeria and the Republic of Trinidad and Tobago and are likely to be found in other developing countries. Public health officials should be alert to the possibility of lead poisoning among both workers and nearby residents exposed to such shops and should take preventive action when lead exposure is identified.

MMWR 7/14/89

Aquarium-Associated *Plesiomonas shigelloides* Infection - Missouri

In July 1988, a community hospital in southeastern Missouri reported isolating *Plesiomonas shigelloides* from the stool of a 14-month-old girl with watery diarrhea (no blood or mucus) and fever. Her highest recorded rectal temperature was 102 F (38.9 C). Her stool was negative for *Campylobacter*, *Salmonella*, *Shigella*, *Yersinia*, *Aeromonas*, and rotavirus. The child was treated with trimethoprim/sulfamethoxazole, and her illness resolved after 5 days.

The child had consumed no shellfish and had never traveled more than 80 miles from her home. She had consumed water only from the municipal system and recently had waded in two area lakes. She attended a day-care center, but no other children in her age group were reported ill. The child did not have an aquarium or other close association with animals. However, 1 evening each week, the child stayed in the home of a babysitter who kept piranhas in an aquarium. When the aquarium was cleaned, the water was poured into the bathtub. The child routinely was bathed in the bathtub before going home. The babysitter reported that the child could have been bathed immediately after the aquarium water had been poured into the bathtub. *P. shigelloides* was isolated from samples of aquarium water submitted to the State Public Health Laboratory. However, plasmid studies were not performed, and it was not determined whether the bacterial strain isolated from the child's stool was identical to that isolated from the babysitter's aquarium.

To estimate the prevalence of *P. shigelloides* in tropical fish tanks, investigators from the Missouri Department of Health (MDH) surveyed aquarium water samples from several sites in Missouri. Samples were taken from 18 aquariums, including at least two tanks from each of Missouri's six regional health districts. *P. shigelloides* was isolated from four (22%) of the 18 tanks. The four tanks were located in three different pet shops: two in central Missouri and one in eastern Missouri. Employees of the three pet shops reported no health problems in the fish in the culture-positive tanks.

MDH advised managers of all surveyed pet shops to have employees wash hands after contact with aquarium water or fish. No special precautions were recommended to managers of shops from which *P. shigelloides* was isolated. In addition, the babysitter was advised to clean the tub thoroughly using chlorine bleach after discarding the aquarium water and before using the tub for bathing.

Editorial Note: *P. shigelloides*, a gram-negative bacterial rod, is an opportunistic pathogen in the immunocompromised host and has been suspected to cause diarrheal illness in normal hosts. However, the organism failed to produce illness in volunteer feeding studies, and its role as an enteric pathogen remains unproven. Persons with *P. shigelloides* infection typically describe a self-limited diarrhea, sometimes with blood and mucus in the stool; appropriate antibiotic therapy appears to shorten the duration of illness. *P. shigelloides* can also cause cellulitis and septicemia.

This organism has been isolated from surface water, the gut of freshwater fish, and many animals (including dogs and cats) and is particularly common in tropical and subtropical habitats. In humans, most isolates have been from stools of patients with diarrhea who live in tropical and subtropical regions of Asia, Africa, and Australia; isolations from Europe and the United States have been rare and usually associated with foreign travel or consumption of raw oysters.

Although no other *P. shigelloides* gastrointestinal infections associated with aquarium water have been re-

ported, the frequency of *P. shigelloides* in pet shop aquariums reported here suggests this could be a source of this rarely recognized infection. Basic precautions, such as handwashing after contact with aquarium water and preventing the contamination of potable or bathing water by aquarium water, should decrease transmission of potentially pathogenic microorganisms from aquarium water.

MMWR 9/15/89

Listeriosis Associated with Consumption of Turkey Franks

Microbiologic implication of meat as a source of clinical listeriosis has not previously been documented. In December 1988, a woman with cancer was hospitalized in Oklahoma with sepsis caused by *Listeria monocytogenes* (LM). LM was isolated from an open package of Plantation Brand turkey franks from the patient's refrigerator. The patient had eaten one turkey frank daily heated in a microwave oven. LM was also isolated from two unopened packages of Plantation Brand turkey franks from a local store. Cultures of other foods in the patient's refrigerator were positive for LM; however, unopened samples of those foods were negative for LM.

LM isolates from the patient and from the opened and unopened packages of franks were confirmed at CDC as serotype 1/2a with the same electrophoretic enzyme type. On April 14, 1989, the company voluntarily recalled the franks, and the U.S. Department of Agriculture began an investigation of the processing plant.

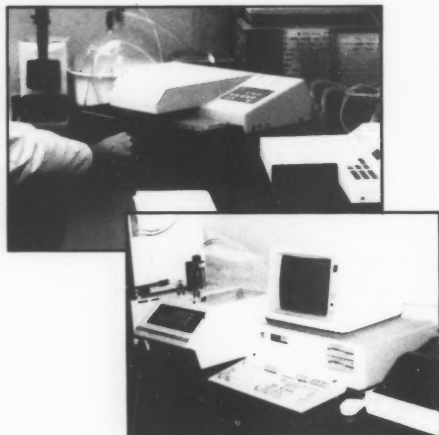
Multiple products from the patient's refrigerator grew LM of the same serotype and enzyme type, suggesting cross-contamination; therefore, isolation of LM from opened packages is not sufficient to identify the source of infection. Isolation from unopened products implicates the source of infection with greater certainty.

An epidemiologic study of dietary risk factors for sporadic cases of listeriosis previously implicated consumption of uncooked hot dogs and undercooked chicken; in that study, no microbiologic specimens were obtained.

LM causes 1700 cases of meningitis and sepsis in the United States each year, with a case-fatality rate of 25%. Listeriosis usually occurs in pregnant women or immunosuppressed persons. Such persons who have eaten this brand of turkey franks and are not ill do not need treatment. Persons who have eaten this food and develop fever, severe headache, or muscle aches should consult their physicians.

MMWR 4/21/89

ABC RESEARCH RESIDUE DETECTION



From Alachor to Zyston,
we can identify over 300
pesticide residues.

ABC Research has the skilled professional staff and a new pesticide laboratory with the modern analytical instrumentation to carry out official methods of residue analysis.

ABC Research offers 12 different pesticide residue scans to detect the presence of related classes of compounds.

Call ABC Research for your residue detection needs:

Phone: 904-372-0436 • FAX: 904-378-6483



ABC Research • 3437 S.W. 24th Ave. • Gainesville, FL 32607

Industry Products

The products included herein are not necessarily endorsed by Dairy, Food and Environmental Sanitation

IR-Plan® Laboratory Microscope

Spectra-Tech has introduced a new FT-IR microscope designed especially to provide maximum ease of operation for chemists and quality control technologists in the food industry. FT-IR is an abbreviation for Fourier Transform-Infrared Spectroscopy.

Spectra-Tech offers the new microscope in two configurations. First: With a room-temperature dTGS detector, the microscope is ideally suited for the analysis of microsamples which are visible to the naked eye (typically, 100 microns and larger). The detector gives results over the full spectral range, from 4000 to 450 cm⁻¹. Second: The microscope is optionally available with a 0.25 mm MCT detector instead of the dTGS detector. Spectra-Tech's MCT detector ensures infrared sampling resolution to the diffraction limit. The MCT version combines high performance and optimum convenience.

Please circle No. 241
on your Reader Service Card



QuickKlips and ARROW Ties

Jilson Corporation's ties are unique because they can be adjusted to the necessary tightness, easily and quickly opened and re-closed as many times as needed without damage to the tie. This reusable feature more than offsets the initial cost of these positive locking, solid plastic ties.

Made of high density polyethylene, Jilson's ties are durable, attractive, and have excellent resistance to weathering. Standard color for QuickKlips and ARROW Ties is red. QuickKlips can be molded with your company name or message directly on the tie to promote your company and products. QuickKlips come in lengths from 3-1/4" to 7". ARROW Ties are available in lengths from 3-1/3" to 17".

Please circle No. 242
on your Reader Service Card

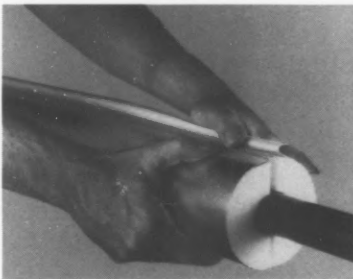


Stainless Steel Bench Scales

Fairbanks Scales has introduced the line of stainless steel Electron Bench scales available in four platform sizes; 10" x 10", 14" x 16", 14" x 18", and 20" x 20" capacities - from 12 lbs. to 200 lbs.

The stainless steel instrument enclosure and scale platform structures are especially designed for harsh water-washdown environments. In addition, to meet other processing plant operating conditions, the instrument can be programmed for any of eleven different levels of filtering to control the effects of vibrations in the area.

Please circle No. 243
on your Reader Service Card



TechLite Insulation Material

New, non-toxic, non-carcinogenic insulation material offering a safe, affordable alternative to the hazards of asbestos and other obsolete and dangerous materials.

Made of flexible Polymeric foam, the TechLite is lightweight and resilient. It provides excellent acoustical and thermal properties from -300 to +350°F temperatures, and to 500°F intermittent. Fire resistant, it creates no smoke, fumes, or gasses when exposed to fire.

Please circle No. 244
on your Reader Service Card

Dependable Freezers

Scientemp designs and manufactures dependable freezers for research, storage, and processing using temperatures down to -96°C (-140°F).

There are 17 models ranging from 1.7 to 21.5 CU. FT. Inventory systems maximize full capacity of each freezer.

Please circle No. 245
on your Reader Service Card



"Chlorination & Dechlorination Disinfection Systems" Brochure

A free, three-color, 16-page brochure with four main disinfection systems fully described and illustrated with photos and flowcharts.

In addition, the brochure covers gas dispensers with capacities from 500 lb./day to 10,000 lb./day, and a full line of accessories and analyzers.

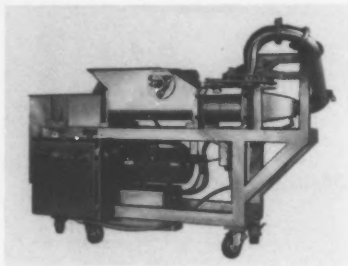
Please circle No. 246
on your Reader Service Card

Multiple Gun Pressure Regulator

The industry's only Multiple Gun Pressure Regulator capable of maintaining precise pressure during long periods of use. Even after 2,000 hours of continuous testing, the regulator showed only minor erosion of the replaceable, stainless steel internal components. The patented system is designed to operate in the pressure range of 1,000 to 20,000 psi at a maximum flow rate of 50 gpm with minimum pressure loss.

Fully adaptable to all other manufacturer's water jetting systems, this regulator works for any application which requires pressure or flow control such as in a hydrostatic testing system.

Please circle No. 247
on your Reader Service Card

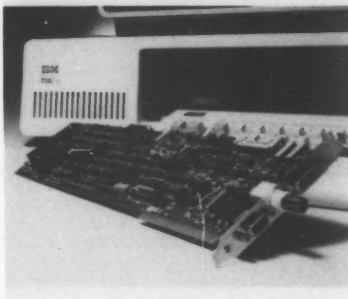


XHP-3 Processing Machine

This machine will continuously extrude extra-heavy viscous products while homogenizing them, and portion the discharge in accurate shapes, sizes, and weights.

Model XHP-3 is just one variation in Doering's newly-expanded line of heavy-duty extruding and pumping machinery. All meet USDA, BISSC and other standards for sanitation and ease of cleaning.

**Please circle No. 248
on your Reader Service Card**



MetraByte's MV2

A low cost, single channel, frame/line grabber interface board designed for real time image processing applications on IBM PC/XT/AT or compatible microcomputers. The MV2 digitizes an analog video signal, stores the digitized image in an on-board video memory bank, allows graphics or text to be overlaid from an EGA/VGA compatible video display board and, if desired, displays the image through a VGA compatible display board. The image may also be stored on a hard or floppy disk.

**Please circle No. 249
on your Reader Service Card**

ESA Coulochem® EC Detector

Provides for superior selectivity and sensitivity over conventional UV detection methods by utilizing a distinctive dual cell design. This design incorporates 100% analyte oxidation and/or reduction conversion at the electrode surface. A third electrode eliminates mobile phase and/or sample compounds which could interfere. The analysis of individual additives is important not only for quality assurance and monitoring compliance with government regulations, but also for toxicity studies.

**Please circle No. 250
on your Reader Service Card**



Sanitile 98-0 Coatings

Sanitile high performance tile-like coatings available in a 98% odorless formula for application in odor sensitive areas.

Coatings provide the same durability, excellent stain resistance and long lasting performance Sanitile is known for.

USDA accepted, resistant to acids, moisture, steam cleaning, and mold. Easy to apply by brush, roller, or spray. Can be applied to previously painted surfaces without extensive surface preparation. Also available in standard low odor formulas for application over the widest range of surfaces, walls, ceilings, and equipment.

**Please circle No. 251
on your Reader Service Card**



Taylor Digital Measurement Instruments

A new Taylor branded line of digital measurement instruments will consist of portable, hand-held measuring instruments for temperature, humidity, air velocity, pH, RPM and gas analysis. These products will be available through Thermometer Corporation of America's (TCA's) industrial supply distributors now carrying the Taylor line. TCA has an established nationwide network of distributors who will market the new Testoterm products.

**Please circle No. 252
on your Reader Service Card**

Solid State Model 1200 Metal Detector

A two-color brochure from Eriez Magnetics features their solid state Model 1200 Metal Detector. Designed for outdoor use, this rugged instrument detects tramp metal in a variety of products including highly mineralized ores, forest and agricultural products, asbestos, tar sands and rubber - even when conveyed on steel-cable belts.

The brochure highlights design features such as all solid-state integrated circuits, LED diagnostic monitor, swing-away coil protection, built-in coast alarm circuitry, easy installation, and maintenance-free operation.

**Please circle No. 253
on your Reader Service Card**

BactoFoss

The dairy and meat processing industry is now, with the BactoFoss, able to make a total bacteria count of incoming raw materials within a few minutes.

With a measuring time of 3 minutes, it is possible to gain usable results, which can be immediately evaluated.

This will release personnel from tedious routine procedures of 3-5 days, which often are only to be used for retrospective purposes.

**Please circle No. 254
on your Reader Service Card**

Direct Reading Personal Dust Monitor

The PDM-3 MINIRAM™, from MIE, Inc., of Bedford, MA, is the world's smallest direct reading personal dust monitor. The PDM-3 senses the concentration of airborne particulate contamination, such as dust, smoke, fume, or mist, and reports results directly in mg/m³. The reliable infrared near forward light scattering detection principle of the MINIRAM is sensitive to particles in the 0.1-10 µm range, and measures concentrations from 0.01-100 mg/m³. The MINIRAM will operate for up to 12 hours on a single charge of its self-contained rechargeable battery, or continuously on AC line current. Particulate contamination data is available in a variety of formats, including 10-second averages, shift averages, or time weighted averages. Data can also be outputted on a continuous basis to a strip chart recorder or the MIE PDL-1 or similar data logger. The MINIRAM measures 4"x4"x2, weighs just one pound, and is MSHA approved (2G-3532-0) as a personal dust monitor.

**Please circle No. 255
on your Reader Service Card**



CSC-Meinzer Sieve Shaker

When this shaker operates, no one listens because you can't hear it! Since a quiet environment is a desirable one, a quiet sieve shaker will keep all surrounding workers in the area happy while necessary shaking continues.

The Meinzer gives accurate, repeatable results in particle-size analysis using an efficient, reliable two-way sieving motion. It is easily operated with two knobs that select the speed of the shaker and the time. It has a compact footprint that will save bench space, and it does not need to be fastened to the work surface. Thus, the Meinzer is ideal for any work situation in the lab, on the production line, or out in the field.

**Please circle No. 256
on your Reader Service Card**



CFS-A Adaptor

Allows the customer to replace spent competitive filter cartridges with the CUNO CFS517/CFS517LS cartridges. The adaptor can be used in the filter heads of other manufacturers, such as Everpure QC2, QC4, and QC7 heads.

These cartridge adaptors allow users to take advantage of the benefits offered by CUNO filters, such as simple cartridge installation and replacement, and extended useful life, resulting in lower maintenance costs and fewer cartridge changes. CUNO filters provide clean, fresh tasting water by eliminating bad taste or smell, and inhibiting scale build-up.

**Please circle No. 257
on your Reader Service Card**

EconoMizer[®] Wipers

EconoMizer[®] cloth-replacement wipers are strong enough to handle most clean-up tasks, yet are soft enough for personal use. They are ideal for soaking up liquids, greases and oils, and other wiping applications.

Each wiper measures 9.8-inches x 16.4-inches and is made of bonded cellulose fibers through a unique manufacturing process that provides adequate strength and absorbency at a lower cost than most other cloth-replacement wipers.

Another space-saver is Scott's Grabber[®] mounting bracket. This 18-gauge steel bracket is designed to securely hold EconoMizer dispenser cartons. The Grabber can be mounted anywhere in the workplace to keep the wipers within easy reach at all times.

**Please circle No. 258
on your Reader Service Card**

Real-World Solid Waste Reference Samples

Produced from actual wastes - not artificial formulations - and assayed by advanced instrumentation, they function as standards bringing a new level of accuracy to laboratory control.

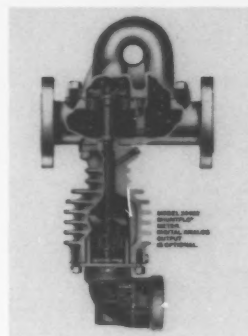
Fisher Scientific reference samples are available for the full spectrum of constituents of interest. They are homogeneous samples, providing analytes of interest in matrices typical of industrial and hazardous wastes. Since they faithfully reflect the complex *in situ* processes (oxidation, hydrolysis, aging) that affect analyte recovery, they provide for the first time a true picture of the waste involved.

**Please circle No. 259
on your Reader Service Card**

R-101 Organic Bacteria

A non-toxic product that will not harm humans or pets. It is recommended for cow barns, sewage plant lagoons, waste storage pits, septic tanks, and fresh water areas including ponds and lakes. R-101 functions aerobically and anaerobically to "cleanup" and deodorize.

**Please circle No. 260
on your Reader Service Card**



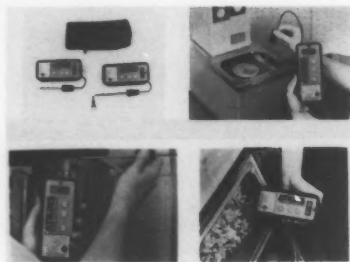
Model 20402 Shuntflo[®] Meter

An axial turbine, totalizing Meter to measure steam, air, sewage gas, or other gases.

Self-contained and self-operated, the Meter requires no external power for the basic unit with a direct reading counter. The compact Meter is easily installed, being mounted directly in and supported by the pipeline.

Accuracy for the Shuntflo[®] is ±2% of actual flow. Sizes range from 1-inch to 24-inches.

**Please circle No. 261
on your Reader Service Card**



330 Series Thermometer

The new 330 series boasts a combined instrument and probe accuracy level of $\pm 1^\circ\text{F}$ within the range of -100°F to $+400^\circ\text{F}$. Thermocouple error is calibrated out at the Atkins plant, and all readings are traceable to the National Institute of Standards and Technology (formerly NBS).

A portable "temperature standard" with system accuracy within 1°F has never been commercially offered before; the normal requirement is that the user accomplish such accuracy using portable field calibration baths or blocks and considerable time and skill.

**Please circle No. 262
on your Reader Service Card**



Model 672P pH Controller

Can be used with any conventional combination pH electrode or any GLI 5-wire Differential Technique pH sensor. The instrument's large LCD can alternately display pH, temperature in $^\circ\text{F}$ or $^\circ\text{C}$, the sensor's mV signal or the 4-20 mA output. The 672P has two integral relays - configurable for various operating modes, including fail-safe operation - to handle virtually any on/off control requirement.

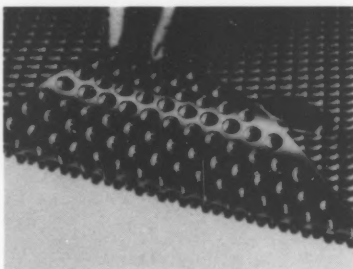
**Please circle No. 263
on your Reader Service Card**

Pest Management Guide

Copesan Services has prepared a comprehensive Pest Management Guide to serve as a one-stop reference on custom-designed service programs, pest services, product information, Food and Drug Administration sanitation guidelines, Material Safety Data Sheet information, and consumer and employee right-to-know information.

An exclusive Copesan Log Book to record service performed and a Pest Control newsletter geared to commercial pest management are also included in the Pest Management Guide.

**Please circle No. 264
on your Reader Service Card**



Knobby Rubber Mats

These heavy-duty rubber mats are designed for hard use and the knobs provide a minimum of rubber in contact with the floor allowing for circulation of air or liquids. Knobby mats have two $3/4$ " die cut hanging holes to facilitate cleaning and drying. Available in black or white and in three sizes, these mats provide maximum non-skid protection and are especially effective in wet areas.

**Please circle No. 265
on your Reader Service Card**



New Pump Brochure

Seven air-operated, double-diaphragm pumps that move everything from liquids and food to abrasive and viscous slurries are described in a new brochure with photos, diagrams, and charts. The smallest ($12'' \times 7''$, $12''$) of these metallic pumps handles a flow of up to 35 gpm /130 lpm, while the largest ($34'' \times 20'' \times 17''$) moves up to 220 mpg/833 lpm.

**Please circle No. 266
on your Reader Service Card**



SCENTOSCAN

A computerized station capable of monitoring sixteen remote locations. Controlled by an integral PC, the system is composed of a portable gas chromatograph which can be disconnected and used independently and a multipoint automatic sampler. A dated, printed record of each analysis is produced with storage on a floppy disk. Data summaries, TWA's, and a high/low alarm for each remote location is provided. Detection of most compounds is to the PPB level.

**Please circle No. 267
on your Reader Service Card**

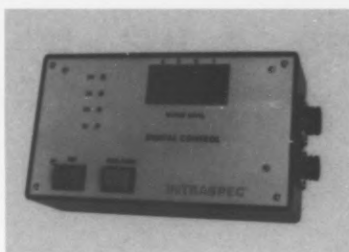


Stainless Steel Caster

Designed to provide the ultimate in corrosion protection, reliability and ease of maintenance. Darnell Stainless Steel casters are manufactured from a basic 18-8 chromium nickel stainless steel. This non-magnetic material is widely accepted in the hospital and medical environments, as well as the food processing industry where the highest degree of sanitation is required.

These casters are offered in the A-100 Series of Darnell Medium Duty casters with load ratings from 300 to 800 pounds capacity and wheel diameters from 4" to 8".

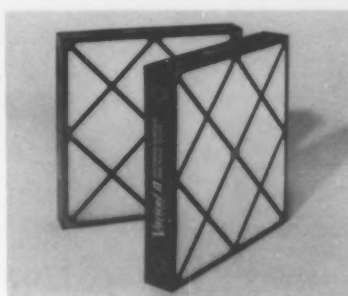
Please circle No. 268
on your Reader Service Card



Liquid Level Control (4) Setpoints

The DIGIT 310 provides 4 programmable setpoints, and 4 corresponding 1.0 amp relay outputs, all encased in an enclosure 4"X7"X2" (HXWXD). An analog level transducer senses the height of liquid, from 0-275" of water, and provides a normalized 0-200mv signal to the DIGIT 310. Programmable deadband is included, and each setpoint provides a resolution of 1 digit, and an accuracy of 0.2%. A 3 1/2 digit, 1/2 inch LED readout displays continuous operating mode readings, as well as each of the 4 setpoint values. Standard units are powered by 115V, 50/60 HZ, and are designed for direct drive and computer interface applications. Current uses include CIP systems, liquid batching, transfer, storage, and similar applications.

Please circle No. 269
on your Reader Service Card



Varicel II Filter

American Air Filter introduces a new high efficiency extended surface mini-pleat filter called "Varicel II". The filter features a totally new concept in filter separator design called "Slim Line" that results in a mini-pleat media pack only four inches thick. The separators consist of beads of adhesive applied in rows 1 1/4 inches apart on both sides of the pleated media. Adjacent separators bond to each other forming a completely unitized media pack.

Please circle No. 270
on your Reader Service Card

Biological Cultures Come to the SOURCE!



American
Type Culture
Collection

1(800)638-6597; 1(301)881-2600;

FREE! Reference catalogues with
over 50,000 strains:

Algae Protozoa
Bacteria Phages:
Cell Lines Hybridomas
Fungi Yeasts
Plant Tissues
Recombinant DNA
Viruses Antisera.

Louis Pasteur (1822 - 1895)-Anthrax
Vaccine; Rabies Vaccine; Pasteurization;
Fermentation;.....
ATCC no. 1229 USDA (S.C. No. 11, Pasteur
vaccine No. 1)(N.R. Smith 1012) J. Bact.
21: 161 (1931); USDA Agr. Monogr. 16: 66 (1952).



Please circle No. 150 on your Reader Service Card

RIO LINDA

CHLORINE DIOXIDE PRODUCTS

FOR INNOVATIVE PROBLEM SOLVING IN THE FOOD,
MILK, DAIRY, AND BEVERAGE PROCESSING INDUSTRIES

- ENVIRONMENTAL CLEANERS
 - SANITATION BEGINS WITH A GOOD ENVIRONMENTAL CLEANER
 - CHLORINE DIOXIDE FOAM
 - CHLORINE DIOXIDE CONVEYER LUBE
 - CHLORINE DIOXIDE CIP SYSTEMS

- MICROBIOLOGICAL CONTROL IN PROCESS WATER
 - COOLING TOWERS
 - EFFLUENT TREATMENT
 - POTABLE WATER TREATMENT

- RIO LINDA CHLORINE DIOXIDE PRODUCTS
 - INTEGRATED SYSTEM ENGINEERING
 - NEUTRAL EFFLUENT pH
 - EPA REGISTERED PRECURSORS
 - QUALIFIED TECHNICAL SUPPORT
 - PROPRIETARY PATENTED TECHNOLOGY

For Further Information Contact

DON ENGLISH or LINDA HANNA

RIO LINDA CHEMICAL

410 N. 10th STREET, SACRAMENTO, CA 95814

916-443-4939

800-822-5022 inside California

or your local Rio Linda Representative

Food Service Code Interpretations

On December 25 you should find a surprise from Santa under the tree. A special delivery letter was sent North requesting that all sanitarians conducting food service evaluations receive a new inspection kit consisting of 3 or 4 digital thermocouple thermometers, several recording thermometers, temperature sensitive tapes, a sanitizer test kit, aerobic bacteria test strips, a pH meter for food, a water activity test instrument, a HACCP instruction book and a new clipboard.

If this package isn't under the tree you must have been bad or Santa just forgot. In any case you can still get the same instruments through your own supply system. Evaluating today's food safety problems takes more than just a pocket stem thermometer. It's time the pocket thermometer is exchanged for state-of-the-art equipment.

Next month marks a new year and a new decade. The 1990's will offer new challenges and new opportunities for professional sanitarians in a wide range of environmental and public health issues.

We faced the same opportunity in the early 70's. Air quality, water pollution, occupational health and other new environmental problems required immediate leadership and direction. Many sanitarians eagerly accepted these new challenges while others hesitated. When the existing public health organizations hesitated, new state and federal agencies (EPA, OSHA) emerged.

Hazardous material management, medical waste, indoor air quality, the HIV (AIDS) epidemic, Lyme Disease, and a new generation of food safety issues are just part of the challenge now being faced. Professional sanitarians that take advantage of continuing education and training will be in a unique position to assist their communities in resolving the environmental and public health problems of the 90's.

OFF THE CLIPBOARD: The Conference For Food Protection Food Safety Education Committee has drafted a national food safety education plan. Copies of the draft plan are available for review and comment. If you would like to review the draft plan send a SASE.

- Restaurant News recently published an excellent article by Patt Patterson on selecting and locating ice machines. Patterson describes water cooled and air cooled units.

- Superfund 89 was held in Washington D.C. during November. A number of technical seminars on hazardous waste management were presented with more than 400 exhibits ranging from asbestos abatement to underground storage tanks. A number of sanitarians are now involved in hazardous waste and hazmat programs. We would like to hear from local and state health departments responsible for these programs.

- If you haven't sent in the FDA Code Interpretation survey from last month take time to do it now. Results will be used in providing interpretation information next year.

- Response to the Fourth Tuesday Temperature check have passed expectations. Next month a special column will be devoted to this issue.

- Several readers have recommended a name change for this column to reflect the wider range of environmental issues that sanitarians are involved in. Starting next month you will see this column with a new name: "PS - Forum for Professional Sanitarians".

Send a self addressed and stamped envelope for a copy of the draft food safety education plan and Patterson's ice machine article to: P.O. Box 1832, Frederick, Maryland 21701.

Homer C. Emery, RS
Chair, FDA Interpretations Committee

Field Inspection Quiz

Here is December's FIQ. Answers to the November FIQ are provided below.

1. During the inspection of a college dining facility you note the use of a centrifugal egg breaking machine. The best course of action would be:
 - A. Explain that the machine is prohibited by food code.
 - B. No action is necessary since the code doesn't specifically address egg breaking machines.
 - C. Consider egg meats adulterated since they come in contact with the shells and prohibit use of the machine.
2. An operator has complained that ground hamburger meat is becoming slimy and malodorous in only 10-13 days when stored at 40 F. You should:
 - A. Explain that this is common at this temperature and recommend storing at -18 to -20 F.
 - B. Recommend the use of another supplier.
 - C. Send samples of the meat to the lab for testing.
3. During a picnic 30 people start vomiting about half an hour after eating lunch. Which would be the most likely cause?
 - A. Under cooked chicken.
 - B. Potato salad maintained at 50 F for 6 hours with a pH of 4.2.
 - C. Copper poisoning from beverage machine.
4. A county resident has called asking for information on Lyme Disease. You should recommend:
 - A. Eating more fruit high in vitamin C.
 - B. Using tick repellent.
 - C. Controlling infestation of cockroaches.
5. A lab report shows *Listeria* in the following foods. Which one would be the most certain?
 - A. Raw hamburger meat
 - B. Ground turkey
 - C. Ready to eat ham salad

Answers to November FIQ: 1. (C) Psychrophiles; 2. (C) -2 C; 3. (C) the holes allow oxygen to enter helping to prevent the growth of *C. botulinum*; 4. soda ash or sodium hydroxide could be used - sodium hydroxide is more hazardous; 5. (B) Best Available Technology.

Affiliate News

GAFES Fall Meeting Report - 1989

The 3rd Annual Fall Meeting of the Georgia Association of Food and Environmental Sanitarians was held on August 25, 1989 at the Holiday Inn - Airport North, Atlanta, Georgia. The theme for the meeting was "New Developments In Pest Control." Approximately 60 persons attended the meeting which featured five speakers representing disciplines in government, higher education, and private industry.

During this meeting, Dave Fry, GAFES delegate for IAMFES, presented to President Bob Brackett the Shogren Award for 1989. This award was recently presented to GAFES during the 1989 IAMFES Annual Educational Conference as the most active affiliate.

In the future, GAFES looks forward to planning its 4th Annual Meeting, tentatively slated for February of 1990. The theme for this meeting will be "Sanitation in the 90's."



President Bob Brackett and Vice-President Joe Frank display the 'Shogren Award' during the GAFES Fall Meeting.



Speakers at the 1989 GAFES Fall Meeting (L-R): Bill Blasingane (Blasingane Services), Dr. Maxey Nolan (University of Georgia Extension Service), Dr. Robert Davis (USDA), and Bob Maxfield (Insect-O-Cuter), (not pictured: Reid Sprengel, (Dow Chemical).

Upcoming IAMFES Affiliate Meetings

FEBRUARY

16, Georgia Association of Food & Environmental Sanitarians (GAFES) Annual Meeting, at the Airport Holiday Inn, I-85 South, Atlanta, GA. Topics: Sanitation for the 90's. For more information call Joseph Frank, 404-542-2453.

26-28, Kentucky Association of Milk, Food and Environmental Sanitarians' Annual Conference to be held at the Holiday Inn South on Fern Valley Road, Louisville, KY. For more information, contact Debbie Pierce, Secretary, KAMFES, PO Box 1464, Frankfort, KY 40602, (502) 564-3340.

MARCH

6-7, Virginia Association of Sanitarians & Fieldmen Annual Meeting, Donaldson Brown Continuing Education Center, Blacksburg, VA. For more information contact Hanev Hodges, 1328 Biscayne Rd. N.W., Roanoke, VA 24019, 703-362-8877.

6-8, Idaho Environmental Health Association Annual Meeting in Boise, ID. Topics to be addressed will be various Environmental Health Concerns. For more information contact Tom Turco, 1455 N. Orchard, Boise, ID 83706, 208-375-5230.

28-30, Michigan Environmental Health Association's 1990 Annual Education Conference at Holiday Inn, Holland, Michigan. For more information contact K. Durwood Zank, R.S., P.O. Box 277, DeWitt, MI 48820-0277, 517-543-2430.

APRIL

4, Ohio Association of Milk Food & Environmental Sanitarians Spring Meeting. For more information write or call Donald Barrett, Health Dept., 181 S. Washington Blvd., Columbus, OH 43215, 614-645-6195.

4, 5, 6, Missouri Milk, Food & Environmental Health Association Annual Meeting, Breckenridge on the Lake, Osage Beach, MO. For more information contact John Norris, Division of Health, Box 570, Jefferson City, MO 65101, 314-751-6400.

11-12, Florida Association Milk Food & Environmental Sanitarians Spring Educational Conference, Deland FL, Hilton Hotel. For more information contact W.R. Thornhill, 3023 Lake Alfred Rd., Winter Haven, FL 33881, 813-299-6555.

MAY

14-16, 1990 Pennsylvania Association of Dairy Sanitarians & Dairy Laboratory Analysts Annual Meeting at the Keller Conference Center, Penn State University, University Park, PA. For more information, contact Sid Bamard, 8 Borland Lab, University Park, PA 16802, 814-863-3915.

23, 25, 25, South Dakota Environmental Health & South Dakota Rural Health, Ramkota Inn, Pierre, SD. For information contact Dave Micklos, SD State Dept of Health, 523 E. Capital, Pierre, SD 57501, 605-773-3141.

JUNE

5-6, Texas Association of Milk, Food & Environmental Sanitarians Annual Meeting, held at the Howard Johnson-South Plaza, Austin, Texas. For more information contact Janie Park, Secretary, P.O. Box 2363, Cedar Park, TX 78613-2363, 512-458-7281.

SEPTEMBER

18-20, New York State Association of Milk and Food Sanitarians Annual Meeting, at the Sheraton Inn-Syracuse, Liverpool, NY. For more information contact Paul Dersam, 27 Sullivan Rd., Alden, NY 14004, 716-937-3432.

26, 27, 28, Kansas Association of Sanitarians Annual Meeting, Red Coach Inn, Salina, KS. For more information contact John Davis, 1900 East 19th, Wichita, KS 67214, 316-268-8351.

Wyoming Public Health Sanitarians Association Held Annual Educational Conference

The Wyoming Public Health Sanitarians Association held their annual educational conference September 19 through 22, 1989, in Buffalo, Wyoming. The meeting was well attended by the members. We were fortunate to have speakers on the following topics: Aquaculture in Wyoming, Retail Exemption and Compliance, HACCP, Food-borne Disease and Pathogens, Marketing Wyoming Products, Wells and Maintenance and Groundwater Strategy and Pesticides.

We also reviewed two new videos now available in our library. In the past year, we have attempted to develop a W.P.H.S.A. library which is growing well and being utilized by the members.

Our next executive council meeting will be held in December in Cheyenne, Wyoming.

For more information please contact Juanita Turner, 122 N. 11th, Worland, WY 82401, 307/347-2617.

Basic Pasteurization Courses, Special Problems Courses

The Texas Association of Milk, Food and Environmental Sanitarians has finalized plans for four training seminars for 1990. The training seminars are entitled "Basic Pasteurization Course" and "Special Problems in Milk Plants".

The "Special Problems in Milk Plants Course" will be geared towards regulatory personnel, plant managers, plant superintendents, supervisors, and plant engineers.

The "Basic Pasteurization Course" will be geared towards regulatory personnel, plant managers, plant superintendents, supervisors, plant engineers and operators.

Each course will have a maximum enrollment of fifty registrants. Enrollment for both courses will be administered by Ms. Janie F. Park. It is requested that all applicants contact Ms. Park by telephone at (512) 458-7281, Monday through Friday, between the hours of 7:00 a.m. CST through 4:00 p.m. CST. Filling of seminar dates will be prioritized on a first come, first served basis. The enrollment fee is \$150.00 per applicant and may be remitted to Ms. Janie F. Park, TAMFES, P.O. Box 2363, Cedar Park, Texas 78613-2363. Checks should be payable to TAMFES. Sustaining members may supply one application for these seminars at no charge. Regulatory officials are exempt from the \$150.00 enrollment fee.

The training dates for the four seminars and the locations are:

Austin, January 9-11, 1990 SPECIAL Howard Johnson South Plaza South Interregional at Woodward 512/448-2444	Houston, July 10-12, 1990 BASIC Viscount - Travel Lodge 2828 Southwest Freeway 713/526-4571
---	---

Dallas, April 10-12, 1990 SPECIAL Le Baron Hotel 1055 Regal Row 214/634-8550	Dallas, October 9-11, 1990 BASIC Le Baron Hotel 1055 Regal Row 214/634-8550
--	---

Lodging will be the responsibility of the individual registrants. Telephone numbers and addresses of host hotels are listed for your convenience. Please state when registering that you are with TAMFES in order to get the appropriate group rates. Airport service available from hotels.

Please be reminded that the sooner you apply, the more likely you are to be enrolled at your place and on your date of greatest choice. We look forward to seeing you at one of the training seminars.

ALPHA CHEM

- products
- service
- equipment
- engineering

for the
**Food
Processing
Industry**

P.O. BOX 431, STOUGHTON, MASS. 02072

Please circle No. 103 on your Reader Service Card

IAMFES Affiliate Officers

ALABAMA ASSOCIATION OF DAIRY & MILK SANITARIANS

Pres., Tom Sauer Huntsville
 Vice Pres. G. M. Gallaspay Childersburg
 Sec'y. Treas., Dr. Tom McCaskey Auburn
Mail all correspondence to:
 Dr. Tom McCaskey
 Dept. of Dairy Sci.
 Auburn University
 Auburn, Alabama 36849
 205-844-1518

ALBERTA ASSOCIATION OF MILK, FOOD & ENVIRONMENTAL SANITARIANS

Pres., Karen Emde Edmonton
 Past Pres., Ron Pillidge Story Plain
 Pres. Elect, Tom Lampman Edmonton
 Sec'y., Kim Graham Edmonton
 Treas., Mike Mavromaras Edmonton
Mail all correspondence to:
 AAMFES
 P.O. Box 8453
 Station F
 Edmonton, Alberta, Canada T6H 5H3

CALIFORNIA ASSOCIATION OF DAIRY & MILK SANITARIANS

Pres., Joe Miranda Cerritos
 Past Pres., Ralph B. Smith Tulare
 1st Vice Pres., Richard Molman Santa Rosa
 Recording Sec'y., Dennis Storms Visalia
 Exec. Sec'y. Treas., Jack Coppes Whittier
Mail all correspondence to:
 Jack Coppes
 P.O. Box 9234
 Whittier, CA 90608
 213-699-4313

CONNECTICUT ASSOCIATION OF DAIRY & FOOD SANITARIANS, INC.

Pres., Bud Pancoast Cromwell
 Vice Pres., C. Rodney Banks
 Sec'y., Donald Shields Guilford
 Treas., Caroline Tighe West Haven
 Asst. Treas., Bud Pancoast
Mail all correspondence to:
 Don Shields
 Ct. Dept. of Agriculture
 165 Capitol Ave.
 Hartford, CT 06106
 203-566-3279

FLORIDA ASSOCIATION OF MILK, FOOD & ENVIRONMENTAL SANITARIANS, INC.

Pres., Ron Schmidt Gainesville
 Past Pres., Oliver Kaufmann Bradenton
 Pres. Elect, Kevin Quinn Tampa
 Sec'y., Charlotte Millsaps Gainesville
 Treas., Dr. W. M. Thornhill Winter Haven
Mail all correspondence to:
 Bill Thornhill
 3023 Lake Alfred Rd.
 Winter Haven, FL 33881
 813-299-6555

GEORGIA ASSOCIATION OF FOOD & ENVIRONMENTAL SANITARIANS

Pres., Dr. Robert Brackett Experiment
 Pres. Elect, Joseph Frank Athens
 Past Pres., Stan Stelskie Atlanta
 Sec'y., Steven P. Petrides Clarkston
 Treas., James C. Camp Douglasville
Mail all correspondence to:
 Steven P. Petrides
 GAFES Secretary
 5643 Wells Circle
 Stone Mountain, GA
 (404) 879-1803

IDAHO ENVIRONMENTAL HEALTH ASSOCIATION

Pres., Rich Gabriel Moscow
 Pres. Elect, Jaren Tolman Burley
 Sec'y. Treas., Tom Turco Boise
Mail all correspondence to:
 Tom Turco
 1455 North Orchard
 Boise, ID 83706
 208-375-5230

ILLINOIS MILK, FOOD & ENVIRONMENTAL SANITARIANS

Pres., Terry Mitchell Romeoville
 Pres. Elect, Joe Delaney Carlisle
 1st Vice Pres., Charlie Price Lombard
 2nd Vice Pres., Claudia Morrow Chicago
 Sec'y. Treas., Clem Honer Glen Ellyn
 Past Pres., Bruce Berg Chicago
 Sargeant At Arms, Paulette Gardner .. Northbrook
Mail all correspondence to:
 Clem J. Honer
 1 S. 760 Kenilworth Ave.
 Glen Ellyn, IL 60137
 312-693-3200

INDIANA ENVIRONMENTAL HEALTH ASSOCIATION INC.

Pres., David M. Bokodi Indianapolis
 Pres. Elect, Bill Emminger Indianapolis
 Vice Pres., Tim Decker Indianapolis
 Treas., Tom Ford Indianapolis
 Sec'y., Margaret Voyles Indianapolis
 Past Pres., Rosemarie Hansell Indianapolis
Mail all correspondence to:
 Indiana Environmental Health Assoc.
 Attn: Tammy Barrett
 Indiana State Board of Health
 1330 W. Michigan Street
 Indianapolis, IN 46206
 317-633-0173

IOWA ASSOCIATION OF MILK, FOOD & ENVIRONMENTAL SANITARIANS, INC.

Pres., Roger Lenius Waverly
 Pres. Elect, Gary Schall
 1st Vice Pres., Scott Core
 2nd Vice Pres., Vicky Streicher
 Sec'y. Treas., Dale R. Cooper Manchester
Mail all correspondence to:
 Dale Cooper
 Box 69
 Manchester, IA 52057
 319-927-3212

KANSAS ASSOCIATION OF SANITARIANS

Pres., Nancy Short Great Bend
 Past Pres., Clarence Daggett El Dorado
 1st Vice Pres., Judy Willingham Manhattan
 2nd Vice Pres., Marla Webster Fostoria
 Sec'y. Treas., John M. Davis Wichita
Mail all correspondence to:
 John M. Davis
 Wichita - Sedgewick Co.
 Dept. of Comm. Health
 1900 E. 9th
 Wichita, KS 67214
 316-268-8351

KENTUCKY ASSOCIATION OF MILK, FOOD & ENVIRONMENTAL SANITARIANS, INC.

Pres., Edsel Moore Frankfort
 Pres. Elect, David Klee Frankfort
 Vice-Pres., Holly Wade Lexington
 Sec'y., Debbie Pierce Frankfort
 Treas./Contact, Judy True Frankfort
 Division of Food & Sanitation
 Food & Sanitation Branch
 275 E. Main St.
 Frankfort, KY 40621
Mail all correspondence to:
 Judy True
 KAMFES, Inc.
 P.O. Box 1464
 Frankfort, KY 40602
 502-564-4856

MASSACHUSETTS MILK, FOOD & ENVIRONMENTAL ASSOCIATION

Pres., Barb Kulig West Springfield
 Vice-Pres., Harlan Fulton Hardwick
 Sec'y. Treas., Fred Kowal Chicopee
Contact:
 Barb Kulig
 Municipal Office Bldg.
 26 Central St.
 West Springfield, MA 01089
 413-781-7550 ext. 3204

MICHIGAN ENVIRONMENTAL HEALTH ASSOCIATION

Pres., John N. Gohlke Lansing
 Pres. Elect, David Gregg Cadillac
 Treas., Debra VandeBunte Holland
 Past Pres., Jim Draze St. Ignace
 Sec'y., Durwood Zank Charlotte
Directors:
 Roger Stroh Michelle Parker
 Dick Fleece Patrick Donovan
 Don Orth Ronald Holben
Mail all correspondence to:
 Jim Draze
 LMAS Dist. Hlth. Dept.
 220 Burdette St.
 St. Ignace, MI 49781
 906-643-7700

MINNESOTA SANITARIANS ASSOCIATION, INC.

Pres., Michael Krim, Dept. of Agriculture
 Pres. Elect, Lee Groehler
 Vice Pres., Kirk Cox
 Sec'y. Treas., Roy E. Ginn
 Jr. Past Pres., David Smith
 Sr. Past Pres., Stephen Watrin

Mail all correspondence to:

Roy Ginn
Dairy Quality Control
5205 Quincy St.
St. Paul, MN 55112
612-785-0484

**MISSISSIPPI ASSOCIATION OF
SANITARIANS, INC.**

Pres., Ralph Turnbo Jackson
Pres. Elect, Greg Geno Booneville
1st Vice Pres., R. J. Prescott McComb
Sec'y, Treas., Susan Howell Tupelo
Treas., Paul Rankin

Mail all correspondence to:

Susan Howell
Lee Co. Health Dept.
532 So. Church St.
Tupelo, MS 38801
601-841-9096

**MISSOURI MILK, FOOD & ENVIRONMENTAL
HEALTH ASSOCIATION**

Pres., Gregg Fast Kirksville
Pres. Elect, Bruce Myers
Vice Pres., Charles Sanders Columbia
Sec'y., Janet Murray Moberly
Treas., John Norris Jefferson City
Past Pres., Grace Steinke St. Louis
Mail all correspondence to:

John Norris
Division Health
Box 570
Jefferson City, MO 65101
314-751-6095

**NEBRASKA ASSOCIATION OF
MILK & FOOD SANITARIANS**

Pres., Nancy Bremer Lincoln
Pres. Elect, Dirk Shoemaker Lincoln
Sec'y. Treas., Jerry Hurt Omaha
Past Pres., A. Richard Brazis Bellevue
Mail all correspondence to:

Jerry Hurt
Mid America Dairymen Inc.
319 N. 72nd St.
Omaha, NE 68114
402-556-0908

**NEW YORK STATE ASSOCIATION OF
MILK & FOOD SANITARIANS**

Pres., Paul Dersam Alden
Pres. Elect, Richard Ledford
Past Pres., John A. Baxter Canajoharie
Cornell Coord., David Bandler Ithaca
Mail all correspondence to:

Paul Dersam
27 Sullivan Rd.
Alden, NY 14004
716-937-3432

**NORTH DAKOTA ENVIRONMENTAL
HEALTH ASSOCIATION**

Pres., Mel Fischer Bismarck
1st Vice Pres., Peri Dura Bismarck
2nd Vice Pres., Dan Mattern Bismarck
Past Pres., Allen Saylor Bismarck
Sec'y. Treas., Greg Abel Bismarck
Member At Large, Allan McKay Devils Lake

Mail all correspondence to:

Greg Abel
P.O. Box 5520
Bismarck, ND 58502
701-224-2382

**OHIO ASSOCIATION OF MILK, FOOD &
ENVIRONMENTAL SANITARIANS**

Pres., Dr. Robert Strong Cincinnati
Vice Pres., Dr. Edward Richter Columbus
2nd Vice Pres., Gloria Swick Columbus
Past Pres., Hermine Willey Reynoldsburg
Sec'y. Treas., Donald L. Barrett Columbus

Mail all correspondence to:
Donald L. Barrett
Health Dept.
181 S. Washington Blvd.
Columbus, OH 43215
614-645-6195

**ONTARIO FOOD PROTECTION
ASSOCIATION**

Pres., Patrick Kwan Mississauga
Vice Pres., Robert Tiffin Kitchener
Sec'y., Coleen Stevens Etobicoke
Treas., Peter Boleszczuk Mississauga
Past Pres., Michael Brodsky Toronto
Editor, Sam Bryks Toronto
Mail all correspondence to:

Peter Boleszczuk
3394 Bertrand Rd.
Mississauga, Ontario
L5L 4G1
Bus: (416) 622-6705
Res: (416) 820-7405

**OREGON ASSOCIATION OF MILK, FOOD &
ENVIRONMENTAL SANITARIANS, INC.**

Pres., Al T. Rydmarck Canby
Vice Pres., Robert Williams Salem
Sec'y. Treas., Floyd W. Bodyfelt Corvallis
Directors:

Ron McKay Salem
Robert Gerding Philomath
Mail all correspondence to:
Floyd Bodyfelt
Wiegand Hall 240
Oregon State University
Corvallis, OR 97331
503-737-3463

**PENNSYLVANIA ASSOC. OF DAIRY
SANITARIANS & DAIRY LAB. ANALYSTS**

Pres., Lew Terrill Saegertown
Pres. Elect, James Dellolla Sharpsville
Vice Pres., Donald P. Lerch Camp Hill
Sec'y. Treas., Audrey Throne Hershey
Past Pres., Linda Knotwell Hershey
Assoc. Advisors:

Stephen Spencer Sidney Barnard
Carol Wallace Anthony Bizzarro
Mail all correspondence to:
Audrey Hostetter Throne
Hershey Choc. Co.
19 E. Chocolate Ave.
Hershey, PA 17033
717-534-4031

**SOUTH DAKOTA ENVIRONMENTAL
HEALTH ASSOCIATION**

Pres., Diane Worall Huron
Pres. Elect, John Robertson
Sec'y. Treas., Dave Micklos Pierre
Past Pres., Elser Rye Aberdeen
Mail all correspondence to:

Dave Micklos, S.D. State Dept. of Health
523 E. Capitol
Pierre, S.D. 57501, 605-773-3364

**TENNESSEE ASSOCIATION OF MILK,
WATER & FOOD PROTECTION**

Pres., Gil Murray Murfreesboro
Pres. Elect, Hugh Wilson Athens
Vice Pres., Ed Miller Lewisburg
Sec'y. Treas., Dennis Lampley Bon Aqua
Archives, Ruth Fuqua Mt. Juliet
Board Member at Large, Ann Draughon Knoxville
Past Pres., David Moss Nashville
Mail all correspondence to:

Dennis Lampley
Rt. #1, Box 468-B
Bon Aqua, TN 37025
615-360-0157

**TEXAS ASSOCIATION OF MILK, FOOD
& ENVIRONMENTAL PROTECTION**

Pres., Al Wagner College Station
Pres. Elect, Kenneth Seaman Fort Worth
Sec'y., Janie Park Austin
Treas., Dr. R. L. Richter College Station
Mail all correspondence to:

IANFES
Janie Park
P.O. Box 2363
Cedar Park, TX 78613-2363
512-458-7281

**VIRGINIA ASSOC. OF SANITARIANS
& DAIRY FIELDMEN**

Pres., James Stump Bristol
1st Vice Pres., James Tate
2nd Vice Pres., Barbara Pennington Amisville
Sec'y. Treas., Haney Hodges Ronoke
Past Pres., Charles Mattox Earlysville
Mail all correspondence to:

Haney Hodges
1328 Biscayne Rd., NW
Roanoke, VA 24019
703-362-8877

**WASHINGTON MILK SANITARIANS
ASSOCIATION**

Pres., Walt Mackin Seattle
Pres. Elect, Berg Giberson Seattle
Sec'y. Treas., Lloyd Luedecke Pullman
Mail all correspondence to:

Lloyd Luedecke
NW 312 True St.
Pullman, WA 99163
509-335-4016

**WISCONSIN ASSOCIATION OF MILK &
FOOD SANITARIANS**

Pres., Ken Kirby Edgerton
Pres. Elect, Dr. P. C. Vasavada River Falls
Past Pres., Randall Dags Madison
1st Vice Pres.

2nd Vice Pres., Joseph Disch DeForest
Sec'y. Treas., Neil Vassau Madison
Membership Chairman, Jim Wickert Madison
Mail all correspondence to:

Neil M. Vassau
P.O. Box 7883
Madison, WI 53707
608-267-3504

**WYOMING PUBLIC HEALTH
SANITARIANS ASSOCIATION**

Pres., Sandi Palmer Cheyenne
Pres. Elect, Linda Stratton Cheyenne
Contact/Sec'y., Juanita Turner Worland
Treas., Bud Anderson Buffalo
Past Pres., Tyrone Welty Casper
Mail all correspondence to:

Juanita Turner
122 N. 11th
Worland, WY 82401
(307) 347-2617

Does business stress cause high blood pressure?



Stress on the job is a real problem for most of us. Many people think high-pressure jobs cause high blood pressure.

Scientists and doctors aren't sure if stress causes high blood pressure. But one thing is for sure: *anybody*, no matter how they react to stress, can have high blood pressure.

If you have high blood pressure, you can control it—with medication, weight control, less salt, and whatever else your doctor tells you to do, every day.

No matter what you do for a living... keep on living.

High blood pressure. Treat it and live.

National High Blood Pressure Education Program,
National Heart, Lung, and Blood Institute,
U.S. Department of Health and Human Services

DSi DATA SPECIALISTS, INC.



Data Specialists, Inc. offers:

- **PROVEN SOFTWARE**
Designed specifically for your industry
- **EXPERIENCE**
Committed to the Cheese & Dairy Industry for the past 7 years
- **TECHNICAL SUPPORT**
Combined data processing experience of over 150 years
- **QUALITY HARDWARE**
IBM SYSTEM/36 and the new AS/400
- **CONSULTING**
- **INSTALLATION**
- **TRAINING**

1021 Proctor Drive • Elkhorn, WI 53121 • 414/723-5726
641 Baeten Road • Green Bay, WI 54304 • 414/498-9754

CHAMPS

Cheese And Milk Producer Systems

Computer Software for:

Dairies	Cheese Distributors
Creameries	Cheese Processors
Cheese Manufacturers	...and other
Cheese Brokers	Milk Receivers

CHAMPS includes:

PRODUCER PAYROLL
LAB COLLECTION
PRODUCT COSTING
BLOCK CHEESE INVENTORY
ORDER ENTRY/DISTRIBUTION
FINANCIALS

DSi Has Taken Software Developed In An Actual Cheese & Dairy Plant. Enhanced it And Utilized It In Plants Across The Nation To Offer You A Solution Unsurpassed In The Industry!

DSi DATA SPECIALISTS, INC.



IAMFES Audio Visuals Library

A Free IAMFES Members' Benefit

DAIRY

- **Causes of Milkfat Test Variations and Depressions** - (140 slides-tape-script-30 minutes). This set illustrates the many factors involved in causing milkfat test variations or depressions in your herd, including feeding, management, stage of lactation, age of samples, handling of samples, and testing procedures. The script was reviewed by field staff, nutritionists, laboratory personnel and county extension staff. It is directed to farmers, youth and allied industry. (Penn State-1982)
- **Controlling Volumes and Fat Losses** - (110 slides-tape-script-30 minutes). Keeping milk volume and product loss from farm to supermarket of fluid dairy products is discussed. This set was done with the cooperation of the dairy industry who reviewed the script and provided opportunities to take pictures. It is designed to be used by milk plants for their processing personnel, regulatory representatives, field staff and milk haulers. (Penn State-1982)
- **The Farm Bulk Milk Hauler** - (135 slides-tape-script-30 minutes). This set covers the complete procedure for sampling and collecting milk from farms. Each step is shown as it starts with the hauler entering the farm lane and ends when he leaves the milk house. Emphasis is on universal sampling and automated testing. Funds to develop this set were provided by The Federal Order #36 Milk Market Administrator. (Penn State-1982)
- **Frozen Dairy Products** - (27 minute videotape). Developed by the California Department of Food and Agriculture. Although it mentions the importance of frozen desserts, safety and checking ingredients; emphasis is on what to look for in a plant inspection. Everything from receiving, through processing and cleaning and sanitizing is outlined, concluded with a quality control program. Directed to plant workers and supervisors, it shows you what should be done. (CA-1987)
- **High-Temperature, Short-Time Pasteurizer** - (59 minute videotape). Provided by the Dairy Division of Borden, Inc. It was developed to train pasteurizer operators and is well done. There are seven sections with the first covering the twelve components of a pasteurizer and the purpose and operation of each. The tape provides the opportunity for discussion after each section or continuous running of the videotape. Flow diagrams, processing and cleaning are covered. (Borden, Inc., 59-min.-1986)
- **The How and Why of Dairy Farm Inspections** - (110 slides-tape-script-15 minutes). This was developed at the request of seven northeast dairy cooperatives and with their financial support. Emphasis is on clean cows, facilities and equipment and following proper procedures. Regulatory agencies cooperated in reviewing the script and taking pictures. This was developed for farmers, youth and allied industry. (Penn State-1984)
- **Milk Processing Plant Inspection Procedures** - (15 minute videotape). Developed by the California Department of Food and Agriculture. It covers pre and post inspection meeting with management, but emphasis is on inspection of all manual and cleaned in place equipment in the receiving, processing and filling rooms. CIP systems are checked along with recording charts and employee locker and restrooms. Recommended for showing to plant workers and supervisors. (CA-1986)
- **Processing Fluid Milk** - (140 slides-script-tape-30 minutes). It was developed to train processing plant personnel on preventing food poisoning and spoilage bacteria in fluid dairy products. Emphasis is on processing procedures to meet federal regulations and standards. Processing procedures, pasteurization times and temperatures, purposes of equipment, composition standards, and cleaning and sanitizing are covered. Primary emphasis is on facilities such as drains and floors, and filling equipment to prevent post-pasteurization contamination with spoilage or food poisoning bacteria. It was reviewed by many industry plant operators and regulatory agents and is directed to plant workers and management. (Penn State-1987)
- **Producing Milk of Good Quality and Flavor** - (114 slides-tape-script-25 minutes). The steps and corrective measures necessary to produce quality milk with good flavor are outlined. It is directed at dairy farmers, field staff, milk haulers and youth. (Penn State-1982)
- **Tests for Milk Quality and Composition** - (140 slides-tape-script-25 minutes). This set shows and describes in simple terms the various quality tests performed on milk samples. These include bacteria, antibiotics, freezing point, pesticides, somatic cells, flavor and others. The purpose, desirable results, and ways to improve poor results are outlined. It was developed for farmers, youth, field staff and allied industry. (Penn State, 1983)

FOOD

- **BISSC - A Sign of Our Times** - (50 slides-script-tape). The presentation was prepared by the Baking Industry Sanitary Standards Committee. The purpose of BISSC, formed in 1949 by six of the national organizations serving the baking industry, is to develop and publish voluntary standards for the design and construction of bakery equipment. Those Standards are now recognized as the definitive sanitation standards for equipment used in the baking industry.
- **Food Safe - Series I** - (4-10 minute videos). (1) "Receiving & Storing Food Safely", details for food service workers the procedures for performing sight inspections for the general conditions of food, including a discussion of food labeling and government approval stamps. (2) "Foodservice Facilities and Equipment", outlines the requirements for the proper cleaning and sanitizing of equipment used in food preparation areas. Describes the type of materials, design, and proper maintenance of this equipment. (3) "Microbiology for Foodservice Workers", provides a basic understanding the microorganisms which cause food spoilage and foodborne illness. This program describes bacteria, viruses, protozoa, and parasites and the conditions which support their growth. (4) "Foodservice Housekeeping and Pest Control", emphasizes cleanliness as the basis for all pest control. Viewers learn the habits and life cycles of flies, cockroaches, rats, and mice. (Perennial Education).
- **Food Safe - Series II** - (4-10 minute videos). Presents case histories of foodborne disease involving (1) *Staphylococcus aureus*, (sauces) (2) *Salmonella*, (eggs) (3) *Campylobacter*, and (4) *Clostridium botulinum*. Each tape demonstrates errors in preparation, holding, or serving food; describes the consequences of those actions; reviews the procedures to reveal the cause of the illness; and illustrates the correct practices in a step-by-step demonstration. These are excellent tapes to use in conjunction with hazard analysis critical control point training programs. (Perennial Education).
- **Food Safe - Series III** - (4-10 minute videos). More case histories of foodborne disease. This set includes (1) Hepatitis "A", (2) *Staphylococcus Aureus* (meats), (3) *Bacillus Cereus*, and (4) *Salmonella* (meat). Viewers will learn typical errors in the preparation, holding and serving of food. Also included are examples of correct procedures which will reduce the risk of food contamination. (Perennial Education).
- **Food Safety Is No Mystery** - (34 minutes videotape). This is an excellent training visual for food service workers. It shows the proper ways to prepare, handle, serve and store food in actual restaurant, school and hospital situations. A policeman sick from food poisoning, a health department sanitarian, and a food service worker with all the bad habits are featured. The latest recommendations on personal hygiene, temperatures, cross contamination, and storage of foods are included. (USDA-1987)
- **Legal Aspects of the Tampering Case** - (about a 25-minute, 1/2" videocassette). This was presented by Mr. James T. O'Reilly, University of Cincinnati School of Law at the fall 1986 Central States Association of Food and Drug Officials Conference. He emphasizes three factors from his police and legal experience - know your case, nail your case on the perpetrator, and spread the word. He outlines specifics under each factor. This should be of the greatest interest to regulatory sanitarians, in federal, state and local agencies. (1987)

On the Line - (30 minute VHS videocassette). This was developed by the Food Processors Institute for training food processing plant employees. It creates an awareness of quality control and regulations. Emphasis is on personal hygiene, equipment cleanliness and good housekeeping in a food plant. It is recommended for showing to both new and experienced workers.

100 Degrees of Doom — The Time and Temperature Caper - (14 minute videotape). Video portraying a private eye tracking down the cause of a salmonella poisoning. Temperature control is emphasized as a key factor in preventing foodborne illness. (Educational Communications, Inc.)

Pest Control in Seafood Processing Plants - (26 minute videotape). Videotape which covers procedures to control flies, roaches, mice, rats and other common pests associated with food processing operations. The tape will familiarize plant personnel with the basic characteristics of these pests and the potential hazards associated with their presence in food operations.

Product Safety and Shelf Life (40 minute videotape). Developed by Borden Inc., this videotape was done in three sections with opportunity for review. Emphasis is on providing consumers with good products. One section covers off-flavors, another product problems caused by plant conditions, and a third the need to keep products cold and fresh. Procedures to assure this are outlined, as shown in a plant. Well done and directed to plant workers and supervisors. (Borden-1987)

Psychiatric Aspects of Product Tampering - (about a 25 minute, 1/2" videocassette). This was presented by Emanuel Tanay, M.D. from Detroit, at the fall 1986 conference of CSAFDA. He reviewed a few cases and then indicated that abnormal behavior is like a contagious disease. Media stories lead to up to 1,000 similar alleged cases, nearly all of which are false. Tamper proof packaging and recalls are essential. Tampering and poisoning are characterized by variable motivation, fraud and greed. Law enforcement agencies have the final responsibilities. Tamper proof containers are not the ultimate answer. (1987)

Safe Handwashing - (15 minute videotape). Twenty-five percent of all foodborne illnesses are traced to improper handwashing. The problem is not just that handwashing is not done, the problem is that it's not done properly. This training video demonstrates the "double wash" technique developed by Dr. O. Peter Snyder of the Hospitality Institute for Technology and Management. Dr. Snyder demonstrates the procedure while reinforcing the microbiological reasons for keeping hands clean. (Hospitality Institute for Technology and Management).

Sanitation for Seafood Processing Personnel - A training video suited for professional food handlers working in any type of food manufacturing plant. The film highlights Good Manufacturing Practices and their role in assuring food safety. The professional food handler is introduced to a variety of sanitation topics including: 1) food handlers as a source of food contamination, 2) personal hygiene as a means of preventing food contamination, 3) approved food storage techniques including safe storage temperatures, 4) sources of cross contamination, 5) contamination of food by insects and rodents, 6) garbage handling and pest control, and 7) design and location of equipment and physical facilities to facilitate cleaning.

Tampering: The Issue Examined - (37 minutes videotape). Developed by Culbro Machine Systems, this videotape is well done. It is directed to food processors and not regulatory sanitarians or consumers. A number of industry and regulatory agency management explain why food and drug containers should be made tamper evident. (Culbro-1987)

Wide World of Food Service Brushes - An 18 minute video tape that discusses the importance of cleaning and sanitizing as a means to prevent and control foodborne illness. Special emphasis is given to proper cleaning and sanitizing procedures and the importance of having properly designed and constructed equipment (brushes) for food preparation and equipment cleaning operations.

ENVIRONMENTAL

Asbestos Awareness - (20 minute videotape). This videotape discusses the major types of asbestos and their current and past uses. Emphasis is given to the health risks associated with asbestos exposure and approved asbestos removal abatement techniques (Industrial Training, Inc.)

Kentucky Public Swimming Pool and Bathing Facilities - (38 minute videotape). It was developed by the Lincoln Trail District Health Department in Kentucky and includes all of their state regulations which may be different from other states, provinces and countries. It was very well done and could be used to train those responsible for operating pools and waterfront bath facilities. All aspects are included of which we are aware, including checking water conditions and filtration methods. (1987)

RCRA - Hazardous Waste - (19 minute video). This videotape explains the dangers associated with hazardous chemical handling and discusses the major hazardous waste handling requirements presented in the Resource Conservation and Recovery Act. (Industrial Training, Inc.)

OTHER

Diet, Nutrition and Cancer - (20 minute video). Investigates the relationship between a person's diet and the risk of developing cancer. The film describes the cancer development process and identifies various types of food believed to promote and/or inhibit cancer. The film also provides recommended dietary guidelines to prevent or greatly reduce the risk of certain types of cancer.

75th IAMFES Annual Meeting Presentations. 30 cassette tapes covering the complete conference. 5 videotapes covering various symposia and sessions (For more specific information, contact Sandy.)

If you are interested in checking out any of our audio-visuals, please fill out this form with the box or boxes checked as to which presentations you wish to view. Mail to: IAMFES, Lending Library, P.O. Box 701, Ames, IA 50010. (You'll be notified by telephone when your tape or slide set is being mailed).

IAMFES MEMBER ONLY

Date Mailed: _____

Name: _____

Company: _____

Address: (For UPS Delivery) _____

City: _____ State/Province _____ Zip Code _____

Country: _____ Daytime Phone No. _____

New IAMFES Members

Alabama

Jean Olds
Auburn University
Auburn

Billy W. Johnson
Alabama Department of Public
Health
Fayette

California

Dimitrios Dimacopoulos
Heartland Industries, Inc.
City of Industry

Delaware

Craig Kostyshyn
Purac Engineering Inc.
Wilmington

Kenneth A. Flaherty Jr.
Purac Engineering Inc.
Wilmington

Florida

Francisco Villegas
Alico Ltd.
Orlando

Illinois

Paul Slaby
City of Elgin
Elgin

Indiana

Daniel J. Monticello
Miles, Inc.
Elkhart

Iowa

Doris Rittenmeyer
State of Iowa
Dept. of Inspections & Appeals
Iowa City

Minnesota

Art Olson
AMPI
New Ulm

Missouri

Howard C. Luh
City of Arnold Co.
Arnold

David Park
Neighborhood Preservation,
City of Kansas City, MO
Kansas City

Darryl Cohen
Kansas City, MO Health Dept.
Kansas City

Robert B. Hagberg
Ecolab, Inc.
St. Charles

New Jersey

Jeffrey R. De Chacon
Pyramid Environmental Systems
Sparta

North Carolina

William C. "Bill" Batten
Thermaco, Inc.
Asheboro

Bill D. Hardister
Mecklenburg Co. Health Dept.
Charlotte

Werner Martin
Leap Technologies
Chapel Hill

Ohio

Thomas I. Lovey
City of Cleveland
Cleveland

Oregon

Kathy Pittman
Reser's Fine Foods, Inc.
Beaverton

Pennsylvania

Bruce W. Boggs
Microbac Labs, Inc.
New Castle

Tennessee

Ray M. Nelson
Procter & Gamble
Jackson

Texas

Carlos Rubinstein
City of Brownsville Health Dept.
Brownsville

George W. Bassett
Bassett Environmental Systems
San Antonio

Virginia

Joseph Eifert
Virginia Tech
Blacksburg

Michael Purello
Stewart Sandwiches, Inc.
Norfolk

Washington

Stan Walthall
State of Washington
Spokane

Wisconsin

Kirby Burt
Schreiber Foods, Inc.
Green Bay

Canada

Robert Tiffin
J.M. Schneider Inc.
Kitchener, Ontario

England

Richard W. Ross
Iceland Frozen Foods Inc.
Merseyside

France

Labic
Ecole Nationale Veterinaire
Toulouse

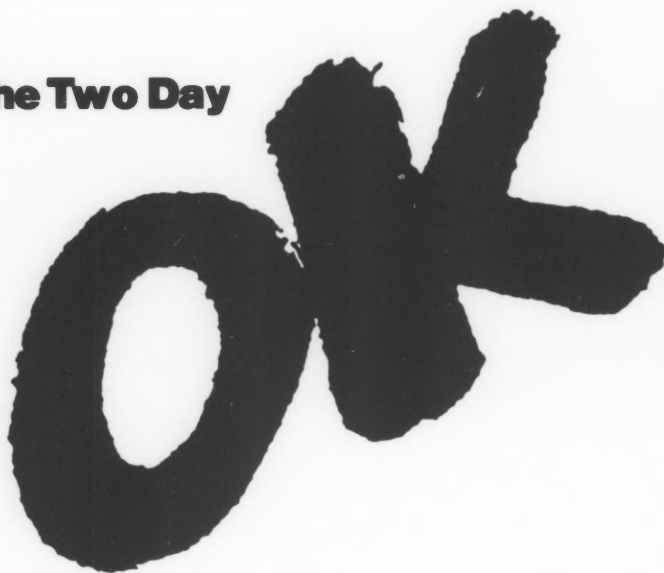
Italy

Dott. Arnaldo Panizzi
Giuseppe Citterio
Salumificio Spa
Rho, Milano

Singapore

Dr. Lay Koon
Singapore Polytechnic
Singapore

The Two Day



Salmonella Testing

It's a step you routinely take to assure the safety of your product. And waiting for test results is costly. That's why using a 2 day test can save you time and money.

Minnesota Valley Testing Laboratory will identify routine negative Salmonella samples in just 2 days with an AOAC (Association of Official Analytical Chemists) approved testing method.

Rapid analysis means you can ship product 3 days sooner. So, there's increased shelf life, distribution flexibility and lower warehousing costs. MVTL's fast, accurate results help you respond to your customers' needs — quickly.

So why wait 5 days for the other guy to identify routine negatives when MVTL can give you an answer in just 2 days?

Call MVTL (507) 354-8517 or (800) 782-3557 in Minnesota, for more information.



Minnesota Valley
Testing Laboratories
Center & German
New Ulm, MN 56073

Copyright © 1986 Minnesota Valley Testing Laboratory

Dairy, Food and Environmental Sanitation Instructions for Authors

Nature of the Magazine

Dairy, Food and Environmental Sanitation is a monthly publication of the International Association of Milk, Food and Environmental Sanitarians, Inc. (IAMFES). It is targeted for persons working in industry, regulatory agencies, or teaching in milk, food and environmental protection.

The major emphases include: 1) practical articles in milk, food and environmental protection, 2) new product information, 3) news of activities and individuals in the field, 4) news of IAMFES affiliate groups and their members, 5) 3-A and E-3-A Sanitary Standards, amendments, and lists of symbol holders, 6) excerpts of articles and information from other publications of interest to the readership.

Anyone with questions about the suitability of material for publication should contact the editor.

Submitting Articles

All manuscripts and letters should be submitted to the Editor, Kathy R. Hathaway, IAMFES, P.O. Box 701, Ames, Iowa 50010.

Articles are reviewed by two members of the editorial board. After review, the article is generally returned to the author for revision in accordance with reviewer's suggestions. Authors can hasten publication of their articles by revising and returning them promptly. With authors' cooperation articles are usually published within three to six months after they are received and may appear sooner.

Membership in IAMFES is not a prerequisite for acceptance of an article.

Articles, when accepted, become the copyright property of *Dairy, Food and Environmental Sanitation* and its sponsoring association. Reprinting of any material from *Dairy, Food and Environmental Sanitation* or republishing of any papers or portions of them is prohibited unless permission to do so is granted by the editor.

Reprints

Reprints of an article may be ordered by the author. An order form for reprints will be sent to you. Reprints may be ordered with or without covers, in multiples of 100. Reprint costs vary according to the number of printed pages in the article. Reprints cannot be provided free of charge.

Types of Articles

Dairy, Food and Environmental Sanitation readers include persons working as sanitarians, fieldmen or quality control persons for industry, regulatory agencies, or in education. *Dairy, Food and Environmental Sanitation* serves this readership by publishing a variety of papers of interest and usefulness to these persons. The following types of articles and information are acceptable for publication in *Dairy, Food and Environmental Sanitation*.

General Interest

Dairy, Food and Environmental Sanitation regularly publishes non-technical articles as a service to those readers who are not involved in the technical aspects of milk, food and environmental protection. These articles deal with such topics as the organization and application of a milk or food control program or quality control program, ways of solving a

particular problem in the field, organization and application of an educational program, management skills, use of visual aids, and similar subjects. Often talks and presentations given at meetings of affiliate groups and other gatherings can be modified sufficiently to make them appropriate for publication. Authors planning to prepare general interest nontechnical articles are invited to correspond with the editor if they have questions about the suitability of their material.

Book Reviews

Authors and publishers of books in the fields covered by *Dairy, Food and Environmental Sanitation* are invited to submit their books to the editor. Books will then be reviewed and published in an issue of *Dairy, Food and Environmental Sanitation*.

Preparation of Articles

All manuscripts should be typed, double-spaced, on 8-1/2 by 11 inch paper. Side margins should be one inch wide.

The title of the article should appear at the top of the first page. It should be as brief as possible and contain no abbreviations.

Names of authors and their professions should follow under the title. If an author has changed location since the article was completed, his new address should be given in a footnote.

Illustrations, Photographs, Figures

Wherever possible, submission of photos, graphics, or drawings to illustrate the article will help the article. The nature of *Dairy, Food and Environmental Sanitation* allows liberal use of such illustrations, and interesting photographs or drawings often increase the number of persons who are attracted to and read the article.

Photographs which are submitted should have sharp images, with good contrast.

Examples of Proper Bibliographic Citations

Paper in a journal

Alderman, G. G. and E. H. Marth. 1974. Experimental production of aflatoxin in citrus juice and peel. *J. Milk Food Technol.* 37:308-313.

Paper in a book

Marth, E. H. 1974. Fermentations. pp. 771-882. In B. H. Webb, A. H. Johnson, and J. A. Alford (eds.), *Fundamentals of dairy chemistry* (2nd ed.), AVI Publishing Co., Westport, CT.

Book

Fennema, O. R., W. D. Powrie, and E. H. Marth. 1973. *Low-temperature preservation of foods and living matter*. Marcel Dekker, Inc., New York. 598 p.

Patent

Hussong, R. V., E. H. Marth, and D. G. Vakaleris. 1964. Manufacture of cottage cheese. U. S. Pat. 3,117,870. Jan. 14.

DAIRY, FOOD AND ENVIRONMENTAL SANITATION INDEX TO VOLUME 9

AUTHORS INDEX

B

- BACHELOR, H. K., (see Peeler, 494).
BARNETT, J. E., (see Peeler, 639).
BELYE, R. L., (see Brown, 444).
BISHOP, J. R., preliminary incubation count, 122.
BROWN, J. R., recycling food processing wastes in agriculture, 444.
BROWN, M., researchers investigate new methods, 21; alternative sanitizer for egg disinfectant, 256; trimming fat off pork, 304; neuropeptides may be a future means of insect control, 502.

C

- CHERNG, Y. S., use of time temperature indicators, 439.
CLEVINGER, T. E., (see Brown, 444).
CLINGMAN, C. D., developing a successful enforcement program, 636.
CORLETT, N. J., assuring safe drug use in dairy production, 450.
CROCKET, E., (see Fogel, 240).

D

- DAUGHERTY, A. N., (see Palchak, 374).

E

- EMERY, H. C., biomonitoring of waste effluents, 176; food service code interpretations, 86; 151; 208; 273; 324; 395; 467; 525; 590.
ERICKSON, P. R., dewatering and recovery of anaerobically digested dairy farm solids, 370.

F

- FARLEY, D., setting safe limits on pesticide residues, 135.
FINDLAY, M., (see Fogel, 240).
FLAHERTY, K. A., thermophilic anaerobic treatment of a wheatstarch processing wastewater, 629.
FOGEL, S., enhanced bioremediation techniques, 240.
FOLKENBERG, J., reporting reactions to additives, 500.

G

- GILMORE, T. M., cleanability requirements of dairy equipment, 75.
GINN, R., study of control of infra-red instruments, 8; study of accuracy of infra-red milk component analysis, 61.
GRAF, T., U.S. milk utilization, dairy international trade, 126.

H

- HAMM, L. G., structural change in U. S. food distribution system, 245.
HANEY, R. L., shelf life of corn tortilla extended by preservatives, 552.
HOOPER, A. J., foodborne illnesses of tomorrow are here today, 549.
HOUGHTBY, G. A., (see Peeler, 639).

J

- JACOBSON, R. E., dairy cooperatives' role in the U.S., 186.

K

- KANE, B. E., (see Speer, 622).
KING, N., update on *Salmonella enteritidis* in eggs, 181.
KING, D. A., pretreatment of snack food bakery wastes, 68.

L

- LESLIE, J. E., (see Peeler, 622).

M

- MARTIN JR., J. H., treatment of dairy processing wastewaters, 295.
MESSER, J. W., (see Peeler, 494); (see Peeler, 639).
MILLER, M., update on human foodborne disease, 254.
MODELAND, V., America's food safety team, 14; fishing for facts on fish safety, 306.
MOLEND, J. R., veterinary public health, 558.

N

- NORRIS, R., (see Fogel, 240).

P

- PACKARD, V., (see Ginn, 8); (see Ginn, 61).
PALCHAK, T. R., is your separator a flow promoting device?, 374.
PEELER, J. T., comparison of preliminary incubation counts, 494; estimation of analyst performance for thermistor cryoscope freezing point testing, 639.
PIETILA, K. A., (see Erickson, 370).

R

- REED JR., G. H., guidelines for food protection and sanitation practices, 365.

S

- SANDERS, R. L., (see Peeler, 494).
SEN, S., food related health services, 554.
SHIPMAN, D. L., fish market guidelines tested, 16.
SKINNER, K. J., *Listeria*, battling back, 23.
SMICK, K., (see Flaherty, 629).
SPEER, S. C., certification for food service managers, 622.

T

- TUMBLESON, M. E., (see Brown, 444).

W

- WILLIAMS, J. E., (see Brown, 444).
WINTER, B. W., (see Zirschky, 138).
WOODBURN, M., myth: wash poultry before cooking, 65.
WYLER, R. L., (see Shipman, 16).

Z

- ZALL, R. R., (see Martin Jr., 295); (see Cherng, 439).
ZIRSCHKY, J., recent changes in environmental regulations, 138.

SUBJECT INDEX

Campylobacter jejuni
education-training-info, 558.

Dairy

- cooperatives and their role, 186.
international trade, 126.
national mastitis council, 153, 316, 576.
production, 122, 450.
processors, 245.
processing equipment, 374.
processing practices, 122.

- processing wastewaters, 295.
 - quality control program, 698.
 - safe drug use, 450.
 - testing methods, 122.
 - U.S. utilization, 126.
- Environmental**
- biomonitoring of waste effluents, 176.
 - regulations, 138.
- Food**
- additives, 182.
 - additive reactions, 500.
 - distribution, 245.
 - health care practices, 554.
 - processing, 444.
- Food and Environmental Hazards to Health**
- 35, 150, 203, 264, 317, 384, 457, 518, 587, 651, 716.
- Food Protection**
- copied with, 706.
 - guidelines, 365.
- Food Safety**
- contamination, 706.
 - government agencies
 - ATF, 14.
 - CDC, 14.
 - Dept. of Justice, 14.
 - EPA, 14.
 - FDA, 14.
 - FTC, 14.
 - foreign, 15.
 - NMFS, 15.
 - state and local, 15.
 - USDA, 14.
 - guidelines, 365.
 - pesticides, 139.
 - residue testing programs, 702.
- Foodservice**
- certification for managers, 622.
 - code interpretations, 86, 151, 208, 273, 324, 395, 467, 525, 590, 653, 724.
- Foodborne**
- illness, 254, 549.
 - education training info, 558.
- Groundwater**
- bioremediation techniques, 240.
- IAMFES**
- affiliate info to host an annual meeting, 209.
 - affiliate news
 - calendar, 38, 90, 152, 209, 272, 325, 397, 468, 526, 592, 725.
 - Georgia, 91, 397, 725.
 - Illinois, 398.
 - Kentucky, 325.
 - Nebraska, 90, 397.
 - New York, 152.
 - Pennsylvania, 468.
 - Tennessee, 39, 592.
 - Texas, 526, 726.
 - Wisconsin, 38.
 - Wyoming, 726.
 - affiliate officers, 95, 279, 469, 727.
- annual meeting**
- abstract of papers presented, 594.
 - awards presented, 669.
 - call for papers form, 577.
 - exhibitor listing, 422, 672.
 - hotel registration form, 93, 155, 223, 329, 403.
 - registration form, 92, 154, 222, 276, 277, 328, 402.
 - report, 654.
 - preliminary program, 211.
 - presidential address, 655.
 - special events program, 156, 221, 278, 330, 404.
 - synopsis of papers, 274, 326, 401.
- audio visuals library, 407, 729.**
- awards**
- nominations, 41.
 - past winners, 42.
 - committee and chairperson, 40, 591.
 - committee reports, 659.
 - constitution and by-laws (changes), 331.
 - deceased members, 715.
 - developing scientist award announcement, 541, 617, 694
 - exhibitor review, 672.
 - from the Ames office, 52, 116, 168, 232, 288, 616, 692, 752.
 - instructions for authors, 158, 341, 733.
 - JFP abstracts, 162.
 - JFP manuscript service page charge increase, 690.
 - letter to the editor, 674.
 - membership/subscription application, 2, 56, 118, 174, 236, 290, 430, 432, 434, 490, 544, 618, 751.
 - new members, 48, 97, 157, 224, 281, 338, 410, 471, 529, 608, 675, 731.
 - past presidents, 43.
 - secretary candidates, 94.
 - secretary nominations, 510, 527.
 - secretary winner announcement, 380.
 - statement of ownership, 690.
 - sustaining members, 6, 58, 120, 170, 238, 292, 362, 436, 492, 546, 620, 696.
 - thoughts from the president, 1, 55, 117, 175, 237, 291, 361, 435, 491, 545, 695.
- Infra-red Instruments, 8, 61.**
- Insect**
- control, 502.
- Listeria monocytogenes***
- battling against, 23.
 - education-training-info, 558.
- Mastitis**
- national council, 153, 316, 528, 576.
- Meat**
- pork, 304.
 - raw contamination, 21.
- Milk**
- dairy quality control program, 698.
 - dairy herd improvements, 61.
 - farm bulk tank, 494.
 - laboratories program on the freezing point, 639.
 - raw, 8.
 - time temperature indicators, 439.
 - U.S. utilization, 126.
- Pest Management, 708.**

Pesticides
residues, 135.
testing programs, 702

Preservatives, 552.

Pseudomonas aeruginosa, 316.

Poultry
egg disinfectant, 256.
washing, 65.

Public Health
enforcement program, 636.
milk laboratories program on the freezing point, 639.
veterinary, 558.

Salmonella enteritidis
control, FDA's role in, 378.
in eggs, 181.

Sanitary Equipment
cleanability requirements, 75.

Sanitation
practices, 365.

Seafood
fish safety, 306.
fish market guidelines, 16.

Soil
dairy farm solids, 370.
treatment of contaminated, 240.

Staphylococci
coagulase-negative infections, 576.

Wastewater
bioaugmentation in the treatment of dairy processing, 295.
effluents testing, 176.
processing wheat starch, 629.
snack food bakeries, 68.

Water
quality act, 138.

Yersinia enterocolitica
education-training-program, 558.

3-A
accepted practices for the design fabrication and installation of
milk equipment (606-03), 679.
batch and continuous freezers for ice cream, ices and frozen
dairy foods (19-04), 743.
equipment design, 75.
fittings used on milk equipment and products (08-17H), 353.
formers, fillers and sealers of single service containers for
milk, 533.
holders list, 413, 476.
liquid pressure and level sensing devices (37-01), 413.
multiple-use plastic materials used as product contact surfaces
in dairy equipment (20-15), 47.
non-coil type batch pasteurizers for milk (24-02), 345.
non-coil type batch processors for milk (25-02), 345.
permanently installed product and solution pipelines (605-03),
416.
stainless steel automotive milk transportation (05-14), 346.

Regular Advertising

ABC RESEARCH CORP., 137, 178, 405, 718.
ALBERT MOJONNIER, 701.
ALPHA CHEMICAL, 195, 369, 727.
AMERICAN INTERPLEX CORP. LABORATORIES, 30, 208,
409, 575.
AMERICAN PUBLIC HEALTH ASSN., 235, 297, 499.
AMERICAN SANITATION INSTITUTE, 191.
AMERICAN TYPE CULTURE COLLECTION, 501, 723.
AMPCO METAL, INC., 412.
AMPI, 253, 412, 638.
AMTEX CHEMICAL CO., 145.
AQUA-AEROBIC SYSTEMS, INC., 294, 377.
AQUAFINE CORP., 54.
AQUIONICS, INC., post card insert (Issue 2, 3).
ASOMA INSTRUMENTS, post card insert (Issue 8).
ATKINS TECHNICAL, INC., 74, 191, 288, 386, 441, 573.
BECTON DICKINSON MICROBIOLOGY SYSTEMS, inside
back cover (Issues 2, 4, 6, 8, 10, 12).
BERNER INTERNATIONAL CORP., 12.
BIOSAN LABORATORIES, INC., 384.
BLUE DIAMOND MANUFACTURING, 305, 398, 556.
BRAUN BRUSH CO., 116, 207.
BREVIS CORP., 690.
BROOKLYN THERMOMETER CO., INC., 207.
CANADA PACKERS, INC., post card insert (Issue 7).
CHEESE REPORTER, 179.
COOL CURTAIN, INC., 409, 573,
COOPER INSTRUMENT CORP., 184.
CURTIS & TOMPKINS LTD., 747.
DAIRY & FOOD INDUSTRIES SUPPLY ASSN., 119, 234,
309, 540.
DATA SPECIALISTS, INC., 386, 730.
DETECTABLE PRODUCTS, 73, 153.
DIVERSEY WYANDOTTE CORP., 178, 369, 555.
DIVERSIFIED RESEARCH, 22.
DSI PROCESS SYSTEMS/DRI-FLO CO., 405.
EASTERN CROWN, INC., 393.
ECOLOGICAL LABORATORIES, INC., post card insert
(Issue 1).
EDUCATIONAL FOUNDATION OF THE NATIONAL
RESTAURANT ASSN., 4, 169, 233, 359, 524.
EDUCATIONAL TESTING SERVICE, inside front cover
(Issue 1), 173, 375, 550.
FIL-CHEM, INC., 141.
FOOD & DAIRY QUALITY MANAGEMENT, INC., 98,
201, 574, 709.
FOOD INDUSTRY INSTITUTE/FOOD SANITATION IN-
STITUTE OF EMA, 325, 406.
FOSS FOOD TECHNOLOGY CORP., 113, 191, 376.
FREDERICKS BIOPHYSICS FOUNDATION, 206, 382, 581.
FRIEND LABORATORY, INC., 185.
GELBER INDUSTRIES, 379.
GO-JO INDUSTRIES, INC., post card insert (Issues 6-12),
289, 357, 433, 489, 543, 619, 693.
GOLDEN STAR, INC., 358.
GRIGGS & MALONEY, INC., 190.
HACH CO., 180, 406.
HAYES MACHINE CO., 589.
HEMA U.S.A., INC., 609.
IDETEK, INC., 197, 294, 360, 449.
INTEGRATED BIOSOLUTIONS, INC., post card insert
(Issues 7-9).
INTERNATIONAL LIFE SCIENCES INSTITUTE-NUTRI-
TION FOUNDATION, 253.
KIRKEGAARD & PERRY LABORATORIES, INC., 354,
372.

KLENZADE, DIV. OF ECOLAB, INC., post card insert
 (Issues 2, 3), 53.
 KNESS MANUFACTURING CO., INC., 376.
 LIQUID SAMPLING SYSTEMS, INC., 523.
 MARCOR DEVELOPMENT CORP., 202, 399, 565.
 MARS AIR DOOR, 119, 409, 509, 557, 627, 701.
 MCGLAUGHLIN OIL CO., 84, 231, 399, 581.
 MICHELSON LABORATORIES, INC., 13, 64.
 MICROCHECK, INC., 86, 149, 197, 234, 394.
 MICROSYS, 635.
 MILLER-ALDRIDGE CHEMICALS, INC., 456.
 MINNESOTA VALLEY TESTING LABORATORIES, INC.,
 60, 225, 327, 411, 472, 566, 734.
 NATIONAL SANITATION FOUNDATION, 67, 183, 586.
 NELSON-JAMESON, INC., 37, 74, 124, 172, 253, 316, 421,
 438, 501, 615, 641, 750.
 NIAGARA BLOWER CO., 400.
 NORTHLAND FOOD LABORATORY, INC., 207, 412, 523,
 585, 715.
 NSI, 202, 376.
 PENBERTHY, INC., 561.
 PENICILLIN ASSAYS, INC., back cover (Issues 1-12).
 PERRENIAL EDUCATION, 581.
 PRUDENTIAL OVERALL SUPPLY, 30.
 REDFERN & ASSOCIATES LTD., 441.
 REELCRAFT INDUSTRIES, INC., 406, 557.
 RID-A-BIRD, INC., 209.
 RIO LINDA CHEMICAL, inside front cover (Issues 3, 8, 9),
 257, 396.
 SANI-MATIC SYSTEMS, 387, 466.
 SANISAFE & ASSOCIATES, INC., 232, 309, 438.
 SEIBERLING ASSOCIATES, INC., 364.
 SERVICE TECTONICS INSTRUMENT, post card insert
 (Issues 2-4).
 SILLIKER LABORATORIES, 51, 184, 354, 387, 451, 529.
 SMITH LABORATORY SERVICE LTD., 206, 523.
 SMITHKLINE ANIMAL HEALTH PRODUCTS, inside front
 cover (Issues 2, 4, 7).
 SOLVIT, INC., 30.
 SPARTA BRUSH CO., 57, 125, 367.
 STAINLESS STEEL FABRICATING, 411.
 STAINLESS STEEL COATINGS, INC., 119, 421.
 SYSTECH INSTRUMENTS, INC., post card insert (Issues 2,
 3, 8).
 T & S BRASS AND BRONZE WORKS, INC., 13, 64, 172,
 368.
 TEGAM, INC., post card insert (Issue 4).
 TEKMAR, 3, 424, 563.
 VCH PUBLISHERS, INC., 467.
 VICAM, 5, 204, 241, 373, 548.
 VIDEO DEVELOPMENT SERVICES, INC., 66.
 WALKER STAINLESS EQUIPMENT CO., INC., 394.
 WATERTEST CORP. 84, 145, 210, 255, 303, 383, 440, 503,
 553.
 WESTAGRO, 202, 421.
 X-O CORP., 85, 184, 369.

Business Exchange

AGRITECH, INC., 429, 532, 611, 742.
 AMERICAN MOULD SERVICE, 44, 99, 159, 226, 285, 343.
 BAR-BEL FABRICATING CO., INC., 45, 160, 226, 425,
 473, 610, 740.
 BCN RESEARCH LABORATORIES, 742.
 BENTLEY INSTRUMENTS, INC., 44, 99, 159, 226, 283,
 342, 426, 473, 530, 610, 677.
 BREDDO LIKWIFIERS, 425.
 BUCHHOLZ ASSOCIATES, 229, 428, 613.

CAPITOL VIAL CORP., 44, 227, 426, 741.
 CHALET CHEESE CO., 426, 532.
 CROMBIE CO., 44, 99, 159, 227, 283, 342, 425, 473, 530,
 610, 677, 740.
 DAIRY ENGINEERING CO., 44, 99, 159, 226, 283.
 DCI, INC., 100, 226, 283, 425, 610, 740.
 DENNIS THAYER ASSOCIATES, 229, 285, 343, 427, 474,
 531, 611, 678, 742.
 DL SALES CO., 342.
 DQCI SERVICES, INC., 45, 100, 161, 228, 285, 342, 427,
 474, 531, 612, 677, 741.
 DUNHILL OF SOUTHEAST FORT WORTH, 46, 102, 161,
 229, 284, 344, 428, 475, 532, 613, 678, 741.
 EC INDUSTRIES, INC., 100, 227, 428, 474, 530.
 EISCHEN ENTERPRISES, INC., 45, 160, 226, 283, 425, 530,
 677.
 ENVIRONMENTAL SYSTEMS SERVICE, LTD., 101, 161,
 228, 285, 427, 531, 612, 677.
 FOOD & DRUG PROFESSIONALS, INC., 284.
 GHK ASSOCIATES, 229.
 GREAT LAKES SCIENTIFIC, INC., 45, 227, 426, 474, 611.
 GUILFORD COUNTY PUBLIC HEALTH DEPT., 284.
 HERITAGE EQUIPMENT CO., 159, 226, 426, 473, 530, 613,
 741.
 INGMAN LABS, INC., 45, 100, 161, 227, 285, 343, 427,
 475, 531, 612, 677, 742.
 INSECTS LIMITED, INC., 427.
 L.J. BIANCO & ASSOCIATES, 46, 101, 160, 228, 285, 343,
 426, 475, 531, 611, 678, 742.
 LINCOLN SUPPLIERS, INC., 227, 283, 343, 428, 474, 530,
 611.
 M & W PROTECTIVE COATING CO., 46, 101, 160, 228,
 285, 611, 678.
 MACHINERY & EQUIPMENT CO., 741.
 MARTIN BROS., 44, 99, 159.
 MCKEE BAKING COMPANY, 678.
 MICHELSON LABORATORIES, INC., 161, 229.
 MIDWEST FOOD SUPPLY CO., 44, 99, 159, 226, 283, 342,
 425, 473, 530, 610, 677, 740.
 NASCO, 45, 99.
 THE NATIONAL FOOD LABORATORY, INC., 101, 160,
 228, 428, 532, 612, 741.
 NEWMAN SANITARY GASKET CO., 343, 475, 531, 612.
 NORTHLAND FOOD LABORATORY/DAIRILAB SERVICE,
 INC., 46, 101.
 PERRY EQUIPMENT CO., INC., 426.
 PROFESSIONAL PEST CONTROL PRODUCTS, 100, 160,
 427, 531.
 PURDUE UNIVERSITY, DEPT. OF FOOD SCIENCE, 475.
 RID-A-BIRD, INC., 611.
 SCI-TEK LABORATORIES, 426.
 SPECIAL PRODUCTS, INC., 99, 611.
 SUPPLY CORP., 44.
 TEXAS WOMAN'S UNIVERSITY, DEPT. OF NUTRITION
 & FOOD SCIENCES, 344.
 UNIVERSITY OF VERMONT, DEPT. OF NUTRITIONAL
 SCIENCES, 475, 532.
 UPJOHN CO., 102.
 W.R. LAWRY, INC., 102.
 WARWICK MFG. & EQPT. CO., INC., 473.
 WEBER SCIENTIFIC, 228, 343, 428.
 WEST LYNN CREAMERY, 100, 283, 342, 429, 473, 530,
 610, 678, 740.
 WOODSON-TENANT LABORATORIES, 612, 741.
 WORTHINGTON FOODS, INC., 229.

Business Exchange "Classifieds"

Equipment For Sale



The CROMBIE COMPANY

521 Cowles Ave.
Joliet, IL 60435-6043
(815) 726-1683

CIRCLE READER SERVICE NO. 339



**Quality Stainless Service
For The Dairy Industry**

NEW AND REBUILT TANKS FOR SALE

Ask for John, Jim or Greg at (608) 847-4131

BAR-BEL FABRICATING CO. INC. MAUSTON, WISCONSIN 53948

CIRCLE READER SERVICE NO. 293

BENTLEY INSTRUMENTS, INC.

**Milk Testing
Equipment**

New and rebuilt milk analyzing equipment for fat, protein, lactose and solids testing. Installation, training, parts and service available.

Call for more information
(612) 448-7600

Bentley Instruments, Inc.
P.O. Box 150
Chaska, MN 55318

CIRCLE READER SERVICE NO. 330



- Silo Tanks
- Horizontal Storage Tanks
- Culture Processors
- Whey Crystallizers
- Custom Engineered Tanks

600 North 54th Avenue
ST. CLOUD, MN 56301
(612) 252-8200

CIRCLE READER SERVICE NO. 353

1 — 5000 gal. cold wall tank
1 — 500 gal. S.S. Gaslin H.P. pump
2 — 6000 gal. milk storage tanks
2 — 600 gal. processing vats
2 — 1000 gal. pressure wall vats
1 — 6000 gal. cold wall tank
1 — lg. assortment of positive and centrifugal pumps
1 — 12000 gal. cold wall tank
1 — 26 barrel vacuum chamber, complete with pump

**Midwest Food
Supply Co.**

504 Clay St., Waterloo, IA 50704
(319) 234-5554

CIRCLE READER SERVICE NO. 292

Filling/Packaging Machines

Cherry-Burrell

1/2 gal. H-100 & NEP-210A

Pure Pak

4-10 oz. Filler UP-M160

West Lynn Creamery
Lynn, Mass.

617-599-1300 ext. 238 Harriet

CIRCLE READER SERVICE NO. 347

Equipment For Sale



- Storage Tanks
- Processing Vats
- Cleaning & CIP Equipment
- Sanitary Pumps
- Refrigeration
- S.S. Fittings, Valves & Tubing

HERITAGE EQUIPMENT COMPANY
3200 Valleyview Drive Columbus, Ohio 43204
Phone: (614) 276-0187

CIRCLE READER SERVICE NO. 320

SELECT used machinery DAIRY EQUIPMENT NEEDED

M&E will purchase your used equipment either complete plants or individual items.

FRUIT FEEDERS

CHERRY BURRELL Model FFH-4
stainless steel with hopper and variable speed motor.
-Two in Stock-

APV GAULIN HOMOGENIZER

Pilot plant model LAB-100-250, three piston, and capable of 4,500 PSI
San Francisco stock

MACHINERY & EQUIPMENT CO.
P.O. BOX 7632-L SAN FRANCISCO, CA 94120

TOLL FREE: National 800-227-4544
California 800-792-2975
Local & International 415-467-3400
Telex 340-212
Fax 415-467-2639

CIRCLE READER SERVICE NO. 311

Employment Opportunities

"ATTENTION"

DAIRY PROFESSIONALS

Are you considering a career change but don't know how to begin a job search? If so contact us for confidential career counseling. At no cost to you we can help with your resume and interview preparation.

For a free brochure call or write:
Mr. Dana S. Oliver - Pres.

Dunhill

OF SOUTHEAST FORT WORTH, INC
4000 Old Benbrook Road
Fort Worth, TX 76116
TELEPHONE: 817-735-4200
FAX: 817-735-9696

CIRCLE READER SERVICE NO. 288

Services / Products

Put The NFL to work for you

A COMPLETE RESEARCH ORGANIZATION

MICROBIOLOGY SERVICES

- INOCULATED PACK STUDIES
- SPOILAGE DIAGNOSIS
- THERMAL DEATH TIME STUDIES
- G M P SANITATION AUDITS
- H A C G P PROGRAM
- CHALLENGE STUDIES FOR REFRIGERATED FOODS
- CONSUMER COMPLAINT INVESTIGATIONS



The National Food Laboratory, Inc.

A SUBSIDIARY OF THE NATIONAL FOOD PROCESSORS ASSOCIATION

6363 CLARK AVE. DUBLIN, CA 94568
(415) 828-1440

CIRCLE READER SERVICE NO. 296

COMPONENT SAMPLES FOR CALIBRATION OF INFRARED TESTERS

Samples are also designed to be used as daily performance checks.*

1 set of 12 in duplicate	\$75.00
Add. sets same week/same address	\$55.00
Skim sample in duplicate	\$ 6.30
E.S.C.C. controls	\$28.50

*1 set equals 2 calibration or 4 daily checks
Call for more information (612) 785-0484

DQCI Services, Inc.

Mounds View Bus. Pk. - 5205 Quincy St., St. Paul, MN 55112

CIRCLE READER SERVICE NO. 356



WOODSON-TENENT LABORATORIES, INC.

345 ADAMS AVE.
MEMPHIS, TN 38108

Phone: 901-525-6333 FAX: 901-528-9108

Woodson-Tenent Laboratories, Inc. is a multi-discipline laboratory offering complete analyses in:

proximate	dietary fiber
minerals	amino acids
lipids	sulfites
	vitamins

We also offer:
complete nutrition labeling
microbiological assays
drug and antibiotic testing
pesticide and other residue screening
mycotoxin/afatoxin screening

CIRCLE READER SERVICE NO. 295



STERILE SAMPLE VIAL

One piece 45, 80, 120, and 240 ml vials. Easy one hand handling, durable, resists cracking, food grade polypropylene.

Phone: 518-853-3377
For samples call or write:

CAPITOL VIAL, INC.

P.O. BOX 446
FULTONVILLE, NY 12072

CIRCLE READER SERVICE NO. 298

Services / Products

COMPLETE LABORATORY SERVICES

Ingman Labs, Inc.
2945-34th Avenue South
Minneapolis, MN 55406
612-724-0121

CIRCLE READER SERVICE NO. 315

Consulting Services

EXPAND BUSINESS & PROFITS

- Analyze Markets
- Exploit Opportunities
- Improve Sales

Programs Designed For Your Needs
Dairy & Food Industry Consultants
For More Than 20 Years

AGRITECH, INC.

1989 West Fifth Avenue
Columbus, Ohio 43212
(614) 488-2772

CIRCLE READER SERVICE NO. 117

For Food Plant Operations Employee Training Materials



- GMP & GSP booklets, slides and video tapes in English & Spanish

L. J. BIANCO & ASSOCIATES
(Associated with L.J.B. Inc.)

FOOD PRODUCT QUALITY CONTROL AND
ASSURANCE CONSULTANTS
850 Huckleberry Lane
Northbrook, IL 60062
708-272-4944

Over 40 years Food Operation Experience

CIRCLE READER SERVICE NO. 297

Listeria Testing

BCN Labs offers years of experience helping the meat industry cope with Listeria problems:

- Professional, confidential results
- USDA/FDA official methods
- \$15/sample (positive or negative)
- Free environmental testing kits
- Volume discounts

BCN Labs can satisfy your QC needs with a full range of microbiological and chemical analyses.

Call today for complete details!

1-800-648-2773

or write to

BCN Research Laboratories
919 Murray Drive
P.O. Box 12440
Knoxville, Tennessee 37912
(615) 688 8460



BCN
Research
Laboratories

CIRCLE READER SERVICE NO. 290

LOW COST TRAINING MATERIAL

DENNIS THAYER ASSOCIATES - - Food Sanitation Consultants
Suite 361-A, 515 East Grant Road #141, Tucson, Arizona 85705

FREE CATALOG



(602) 620-9099

CIRCLE READER SERVICE NO. 327

IAMFES Manuals

IAMFES MANUALS

- * Procedures to Investigate Foodborne Illness — *New 4th Edition*
- * Procedures to Investigate Waterborne Illness
- * Procedures to Investigate Arthropod-Borne and Rodent-Borne Illness

These three excellent manuals are based on epidemiologic principles and investigative techniques that have been found effective in determining causal factors of disease outbreaks.

Single copies are available for \$5.00 ea.; 25-99 copies \$4.75 ea.; and 100 or more copies are \$4.25 ea.

Call 800-525-5223 or 515-232-6699, ask for Julie.

International Association of Milk, Food and Environmental Sanitarians Inc.

P.O. Box 701 - 502 E. Lincoln Way - Ames, Iowa 50010 - (515) 232-6699 - 1-800-525-5223 (outside Iowa)

CIRCLE READER SERVICE NO. 359

3-A SANITARY STANDARDS

The Complete Dairy Sanitary Standards Booklet is available from the IAMFES Office, P.O. Box 701, Ames, IA 50010. 515-232-6699

3-A DAIRY SANITARY STANDARDS \$33

3-A DAIRY AND EGG SANITARY STANDARDS \$48

3-A EGG STANDARDS \$28

5-year updates on the above \$44

All prices include postage. Payment must accompany order. Master Card and Visa accepted.

Call 800-525-5223 or 515-232-6699, ask for Julie.

CIRCLE READER SERVICE NO. 358

3-A Sanitary Standards for Batch and Continuous Freezers for Ice Cream, Ices and Similarly Frozen Dairy Foods

Number, 19-04

Formulated by
International Association of Milk, Food and Environmental Sanitarians
United States Public Health Service
The Dairy Industry Committee

It is the purpose of the IAMFES, USPHS, and DIC in connection with the development of the 3-A Sanitary Standards program to allow and encourage full freedom for inventive genius or new developments. Specifications for batch and continuous freezers for ice cream, ices, and similarly-frozen dairy foods heretofore or hereafter developed which so differ in design, material, and fabrication or otherwise as not to conform with the following standards, but which, in the fabricator's opinion, are equivalent or better may be submitted for the joint consideration of IAMFES, USPHS, and DIC at any time.

A

SCOPE

A.1

These standards cover the sanitary aspects of batch and continuous freezers for ice cream, ices, and similarly-frozen dairy foods and equipment integral therewith, including pumps, equipment for incorporating air or introducing flavoring material into the product and mix supply tanks attached to and made as a part of the freezer. These standards cover equipment designed for the freezing of ice cream, ices, and similarly-frozen dairy foods which are to be subsequently hardened in cold storage rooms, cabinets, tunnels or boxes. They do not pertain to equipment designed for freezing soft ice cream, malts, custards, and similarly-frozen products which are served to the consumer without further hardening.

A.2

In order to conform with these 3-A Sanitary Standards, batch and continuous freezers for ice cream, ices, and similarly-frozen dairy foods shall comply with the following design, material, and fabrication criteria.

B

DEFINITIONS

B.1

Batch Freezers: Shall mean equipment designed to be operated intermittently with the cycle consisting of (1) admitting the product to the freezing cylinder, (2) partially freezing and incorporating air into the product, (3) adding fruits, nuts, and flavoring materials when desired and (4) discharging the product, the cycle to be repeated as required.

B.2

Continuous Freezers: Shall mean equipment designed to be operated in such a manner as to (1) partially freeze and

incorporate air into the product as it flows continuously through the freezing cylinder(s) and (2) discharge the product(s).

B.3

Product: Shall mean the liquid ice cream, ices, and similarly-frozen dairy food mixes and the viscous, semi-solid material, to which may have been added fruits, nuts, and other flavoring materials, with or without incorporated air resulting from the partial freezing of these mixes.

B.4

Surfaces

B.4.1

Product Contact Surface: Shall mean all surfaces which are exposed to the product and surfaces from which liquids and/or solids may drain, drop or be drawn into the product. Lines for air under pressure shall be considered product contact surfaces from the sanitary check valve to the point of entrance into the mix.

B.4.2

Non-Product Contact Surface: Shall mean all other exposed surfaces.

B.5

Mechanical Cleaning or Mechanically Cleaned: Shall denote cleaning, solely by circulation and/or flowing chemical detergent solutions and water rinses onto and over the surfaces to be cleaned, by mechanical means.

B.6

Engineering Plating: Shall mean plated to specific dimensions or processed to specified dimensions after plating*¹

C

MATERIALS

C.1

Sanitary fittings that have product contact surfaces that are integral parts of and furnished with freezers shall comply with applicable provisions of the 3-A Sanitary Standards for Fittings, Parts I and II, Number 08-17, rev.

C.2

Pumps that have product contact surfaces that are integral parts of and furnished with freezers shall comply with applicable provisions of the 3-A Sanitary Standards for

*QQ-C-320b Federal Specification for Chromium Plating (Electrodeposited) June 7, 1985; Amendment 4, 1987. Available from General Services Administration, 18th and F Sts., NW, WFCIA, Washington, DC 20405.

QQ-N-290a Federal Specification for Nickel Plating (Electrodeposited) November 12, 1971. Available from General Service Administration, 18th and F Sts., NW, WFCIA, Washington, DC 20405.

Centrifugal and Positive Rotary Pumps, Number 02-08 and/or 3-A Sanitary Standards for Homogenizers and Pumps of the Plunger Type, Number 04-03.

C.3

Instrument fittings that have product contact surfaces that are integral parts of and furnished with freezers shall comply with the applicable provisions of the 3-A Sanitary Standards for Instrument Fittings, Number 09-07.

C.4

Sanitary tubing having product contact surfaces that are integral to and furnished with freezers shall comply with the applicable provisions of the 3-A Sanitary Standards for Polished Metal Tubing, Number 33-00.

C.5

All other product contact surfaces shall be of stainless steel of the AISI 300 series² or corresponding ACI³ types (See Appendix, Section E.), or metal which under conditions of intended use is at least as corrosion-resistant as stainless steel of the foregoing types, and is non-toxic and non-absorbent, except that:

C.5.1

Freezing cylinder liners (tubes) made of the materials provided for in C.5 may be covered with an engineering plating of chromium.

C.5.2

Freezing cylinder liners (tubes) may also be made of other non-toxic structurally suitable heat-exchange metal made corrosion-resistant and wear-resistant by covering the product contact surface(s) with an engineering plating of chromium.

C.5.3

Bearings, springs, shafts, couplings, drive and mounting pins, and scraping parts may also be made of stainless steel of the AISI 400 series² or may be made of non-toxic, non-absorbent metal that is as corrosion-resistant, under conditions of intended use, as stainless steel of the AISI 400 series or is made as corrosion-resistant by a covering of an engineering plating of nickel or chromium.

C.5.4

Solder, when used, shall be silver solder and shall be corrosion-resistant, free of cadmium, lead and antimony, non-absorbent, and shall not impart any toxic substance to the product when exposed to the conditions encountered in the environment of intended use and in cleaning and bactericidal treatment.

C.5.5

Rubber and rubber-like materials may be used for metering devices, air tubing, port covers, gaskets, seals, and parts having the same functional purposes.

C.5.6

Rubber and rubber-like materials when used for the above specified applications shall comply with the applicable

provisions of the 3-A Sanitary Standards for Multiple-Use Rubber and Rubber-Like Materials, Number 18-00.

C.5.7

Plastic materials may be used in sight openings and for bearings, metering devices, air tubing, port covers, scraper blades, gaskets, seals, and parts having the same functional purposes.

C.5.8

Plastic materials when used for the above specified applications shall comply with the applicable provisions of the 3-A Sanitary Standards for Multiple-Use Plastic Materials, Number 20-15.

C.5.9

Rubber and rubber-like materials and plastic materials used for bonded gaskets having product contact surfaces, shall be of such composition as to retain their surface and conformation characteristics when exposed to the conditions encountered in the environment of intended use and in cleaning and bactericidal treatment.

C.5.10

The final bond and residual adhesive, if used, of bonded rubber and rubber-like materials and bonded plastic materials shall be non-toxic.

C.5.11

Where materials having certain inherent functional properties are required for specific applications, such as scraper parts and seal parts, tungsten carbide, carbon or ceramic materials may be used. Tungsten carbide, carbon and ceramic materials shall be inert, non-porous, non-toxic, non-absorbent, insoluble and resistant to scratching, scoring, and distortion when exposed to the conditions encountered in the environment of intended use and in cleaning and bactericidal treatment.

C.5.12

Optional metal alloy may be used for scraper blades, shafts, bearings, discharge gates and front heads of batch freezers but only in applications requiring manual cleaning. See Appendix, Section H for the composition of an acceptable optional metal alloy.

C.5.13

Optional metal alloy may be used for bearings in continuous freezers but only in applications requiring manual cleaning or in applications where mechanical cleaning regimens exclude the use of acid cleaning chemicals. See Appendix, Section H for the composition of an acceptable optional metal alloy.

C.6

Non-product contact surfaces shall be of corrosion-resistant materials or material that is rendered corrosion-resistant. If coated, the coating used shall adhere. Non-product contact surfaces shall be relatively non-absorbent, durable, and cleanable. Parts removable for cleaning having both product contact and non-product contact surfaces shall not be painted.

D

FABRICATION

D.1

All product contact surfaces shall have a finish at least as

²The data for this series are contained in the following reference: AISI Steel Products Manual, Stainless and Heat Resisting Steels, December, 1974. Table 2-1, pp. 18-20. Available from American Iron and Steel Institute, 1000 16th St., NW, Washington, DC 20036.

³Steel Founders' Society of America, Cast Metals Federation Bldg., 455 State St., Des Plaines, IL 60016.

smooth as a No. 4 ground finish on stainless steel sheets, and be free of imperfections such as pits, folds, and crevices in the final fabricated form. (See Appendix, Section F.)

D.2

Permanent joints in metallic product contact surfaces shall be continuously welded. If it is impractical to weld, they may be silver soldered. These areas having product contact surfaces shall be at least as smooth as a No. 4 ground finish on stainless steel sheets and be free of imperfections such as pits, folds, and crevices.

D.3

Silver solder may be used for attaching blade mounting pins, bushings, and bearings.

D.4

The thickness of engineering plating on product contact surfaces shall be not less than 0.0002 inch (0.005 mm) except that when these surfaces are other than stainless steel, the thickness of engineering plating shall be not less than 0.002 inch (0.05 mm).

D.5

Freezers that are to be mechanically cleaned shall be designed so that the product contact surfaces of the freezer, and all non-removable appurtenances thereto can be mechanically cleaned and are accessible for inspection.

D.6

Product contact surfaces not designed to be mechanically cleaned shall be easily accessible for cleaning and inspection either when in an assembled position or when removed. Removable parts shall be readily demountable.

D.7

Gasket retaining grooves in product contact surfaces shall be no deeper than their width.

D.8

Radii

Internal angles of 135 degrees or less on product contact surfaces shall have radii of not less than 1/4 inch (6 mm) except that:

D.8.1

Smaller radii may be used when required for essential functional purposes such as sealing ring grooves, scraper blade mounting pins, holes or grooves, guides for batch freezer discharge gates and other assemblies of machined parts. In no case shall such radii be less than 1/32 inch (one mm).

D.8.2

The radii in grooves for standard 1/4 inch (6 mm) O-Rings shall be not less than 3/32 inch (2 mm) and for standard 1/8 inch (3 mm) O-Rings shall be not less than 1/32 inch (one mm).

D.9

Sanitary fittings shall comply with the applicable provisions of the 3-A Sanitary Standards for Fittings, Parts I and II, Number 08-17, rev.

D.10

Instrument fittings and connections shall comply with the applicable provisions of the 3-A Sanitary Standards for Instrument Fittings and Connections, Parts I and II, Number

09-07.

D.11

Sanitary tubing shall comply with the applicable provisions of the 3-A Sanitary Standards for Polished Metal Tubing, Number 33-00.

D.12

Pumps having product contact surfaces shall comply with the applicable provisions of the 3-A Sanitary Standards for Centrifugal and Positive Rotary Pumps, Number 02-08 and 3A Sanitary Standards for Homogenizers and Pumps of the Plunger Type, Number 04-03.

D.13

There shall be no threads on product contact surfaces, except those in pumps as provided for in the 3-A Sanitary Standards for Centrifugal and Positive Rotary Pumps, Number 02-08.

D.14

Coil springs having product contact surfaces shall have at least 3/32 inch (2 mm) openings between coils including the ends when the spring is in a free position.

D.15

Shafts of freezers shall have a seal of a packless-type, sanitary in design. Bearings having a product contact surface shall be of non-lubricated type. Lubricated bearings, including the permanent sealed type, shall be located outside the product contact surface with at least one inch (2.54 cm) clearance open for inspection between the bearing and any product contact surface. When a shaft passes through a product contact surface, the portion of the opening surrounding the shaft shall be protected to prevent the entrance of contaminants.

D.16

Openings in the freezing cylinder liner shall be fitted with a permanently installed sanitary pipeline fitting unless the opening is closed by another part of the freezer such as the shaft and seal or the end covers.

D.17

When air drawn from the atmosphere is introduced into the product in a continuous freezer, a single service filter shall be installed in the air line as close as practical to the point of air application, and a spring loaded product check valve of sanitary design shall be installed between the filter and the point of air application.

D.18

When air under pressure is introduced into the product, a single service air filter shall be installed in the air line as close as practical to the point of air application, and a product check valve of sanitary design shall be installed downstream from the filter.

D.19

The filter required in D.17 and D.18 shall be equivalent to the air pipeline and disposable filter performance found in 3-A Accepted Practices for Supplying Air Under Pressure, Number 604-03.

D.20

Equipment for producing air under pressure and/or air piping which is supplied as an integral part of the freezer shall comply with the applicable provisions of the 3-A

Accepted Practices for Supplying Air Under Pressure, Number 604-03.

D.21

Bonded rubber and rubber-like gaskets and bonded plastic gaskets shall be bonded in a manner that the bond is continuous and mechanically sound so that when exposed to the conditions encountered in the environment of intended use and in cleaning and bactericidal treatment the rubber or rubber-like material or the plastic material does not separate from the base material to which it is bonded.

D.22

Freezer Supports

The means of supporting a freezer shall be one of the following:

D.22.1

With legs: Legs shall be smooth with rounded ends, have no exposed threads, and shall be of sufficient length to provide a clearance between the lowest part of the base and the floor of no less than 6 inches (15 cm). Legs made of hollow stock shall be sealed.

D.22.2

With casters: Casters shall be of sufficient length to provide a clearance between the lowest part of the base and the floor of no less than 4 inches (10 cm). Casters, if provided, shall be durable and of a size that will permit easy movement of the freezer.

D.23

A freezer designed to be installed partially outside a processing area shall be provided with a plate or other suitable member to close the opening in the processing room wall and shall be such that it can be sealed to the wall.

D.23.1

All product connections to freezers shall be within a process area.

D.24

Guard(s) required by a safety standard that will not permit accessibility for cleaning and inspection when in place shall be designed so that they can be removed without the use of tools.

D.25

Non-product contact surfaces shall be smooth, free of pockets and crevices and be readily cleanable. Surfaces to be coated shall be effectively prepared for coating.

D.26

Mix Supply Tanks

Integral mix supply tanks, if used, shall comply with the following:

D.26.1

The tank shall be provided with a cover. Tank covers (1) shall be self-draining, (2) shall be provided with a handle(s) of sanitary design, (3) shall have downward flanges not less than 3/8 inch (10 mm) along each edge and (4) shall be close fitting.

The edges of openings in the cover shall extend upwards at least 3/8 inch (10 mm) or be fitted with a permanently installed sanitary pipeline fitting. Openings in the cover not fitted with a permanently installed sanitary pipeline

fitting shall be provided with removable covers having downward flanges of not less than 1/4 inch (6 mm). Non-removable covers shall be designed so that when the covers are in any open position, liquid from the exterior surface will not drain into the tank and shall be designed so that when in their fully opened position, drops of condensation on the underside will not drain into the tank.

D.26.2

Tank valves shall conform to the applicable provisions of the 3-A Sanitary Standards for Fittings, Parts I and II, Number 08-17, rev.

D.26.3

Tanks having such a capacity that the contents of the tank will normally not be transferred to the freezing cylinder within 30 minutes shall be so designed that the temperature of the mix will not exceed 45 degrees F (7.2 degrees C) at any time. In determining conformance with this temperature requirement, the test shall be conducted in an ambient temperature of 100 degrees F (37.8 degrees C).

D.26.4

Sight openings, when provided, shall be of such design and construction that the inner surfaces drain inwardly; and if the tank is designed for mechanical cleaning, the inner surface of the plastic shall be relatively flush with the inner surface of the tank or cover.

D.27

Fruit and/or flavor funnels and observation ports shall be provided with self-draining removable covers having downward flanges of not less than 1/4 inch (6 mm) and handles of sanitary design.

D.28

Information Plates

D.28.1

Continuous freezers shall be provided with a prominently displayed information plate which provides guidance to the user for the selection of correct cleaning procedures and cleaning compounds.

D.28.1.1

The information plate shall list the materials used in the construction of product contact surfaces which are susceptible to attack by acid cleaners and it shall warn against the use of acid cleaners on these materials.

D.28.1.2

The information plate shall recommend that a cleaning compound supplier be consulted for the proper selection of chemicals and procedures. (See Appendix, Section G.)

D.28.2

Batch freezers shall have a prominently displayed information plate noting that manual cleaning is required in accordance with the manufacturer's recommendations and that the use of acid cleaners is not recommended. (See Appendix, Section G.)

APPENDIX

E

STAINLESS STEEL MATERIALS

Stainless steel conforming to the applicable composition

ranges established by AISI² for wrought products, or by ACT³ for cast products, should be considered in compliance with the requirements of section C.5 herein. Where welding is involved, the carbon content of the stainless steel should not exceed 0.08%. The first reference cited in C.5 sets forth the chemical ranges and limits of stainless steels of the 300 series. Cast grades of stainless steel equivalent to types 303, 304, and 316 are designated CF-16F, CF-8, and CF-8M respectively. These cast grades are covered by ASTM⁴ Specifications A351/A351M, A743/A743M, and A744/A744M.

F

PRODUCT CONTACT SURFACE FINISH

Surface finish equivalent to 150 grit or better as obtained with silicon carbide properly applied to stainless steel sheets is considered in compliance with the requirements of Section D.1 herein.

G

INFORMATION PLATES

G.1

The specific information displayed on the information plate required in D.28.1 for continuous freezers will vary among freezer manufacturers. The following example is for illustration purposes only.

CAUTION

Some product contact parts in this machine are made of chrome plated nickel or optional metal alloy. Acid cleaning compounds will cause serious corrosive damage to these parts. Consult your cleaning compound supplier for the selection of correct chemicals and procedures.

G.2

The following example illustrates a typical information plate for the batch freezers as required in D.28.2.

CAUTION

Manual cleaning of this machine is required. Follow the recommended cleaning instructions in your operators manual. Do not use acid cleaning compounds.

H

OPTIONAL METAL ALLOY

An optional metal alloy having the following minimum and maximum composition is deemed to be in compliance with C.5.12 and C.5.13 herein.:

Zinc	— 8% maximum
Nickel	— 19% minimum
Tin	— 3 1/2% minimum
Lead	— 5% maximum
Iron	— 1 1/2% maximum
Copper	— the balance

An alloy of the composition given above is properly designated "nickel silver", or according to ASTM⁴ Specification B584-85B/Specification for Copper Alloy Sand Castings for General Applications may be entitled "leaded nickel bronze."

⁴Available from ASTM, 1916 Race St., Philadelphia, PA 19103.

These standards shall become effective March 20, 1990 at which time the 3-A Sanitary Standards for Batch and Continuous Freezers for Ice Cream, Ices and Similarly Frozen Dairy Foods, Number 19-03 are rescinded and become null and void.



Curtis & Tompkins, Ltd.

Analytical Laboratories Since 1878

**A Full Service Laboratory Providing Testing
of Food, Water, Feed and Agricultural Products**

- Food Poisoning Bacteria
- Listeria/Salmonella
- Pesticides/Toxins
- Shelf Life Evaluation
- Nutritional Labeling
- Vitamins

USFDA Approved & USDA Certified

1250 S. Boyle Ave., Los Angeles, CA 90023
(213) 269-7421 FAX (213) 268-5328

Today's Technology, Backed by More Than a Century of Service

Please circle No. 102 on your Reader Service Card

Coming Events

1990

JANUARY

8-12, Technology of Bakery Production. American Institute of Baking, Manhattan, KS. Contact: Melinda Enns at (913) 537-4750.

8-12, Electrical Troubleshooting. American Institute of Baking, Manhattan, KS. Contact: Melinda Enns at (913) 537-4750.

8-17, 40th Annual University of Maryland Ice Cream Short Course. Contact Dr. James T. Marshall, Department of Animal Sciences, University of Maryland, College Park, Maryland 20742 (or call 301/454-7843).

9, Managing Solid Waste, one-day symposium sponsored by the National Restaurant Association, held at the J.W. Marriott Hotel in Washington, DC. To register, contact the association's technical services department at 800/424-5156 or 202/331-5900; or write to the National Restaurant Association, Symposium on Solid Waste Management, 1200 Seventeenth St., NW, Washington, DC 20036.

9-11, The Second Annual "Technology and Regulatory Developments Conference" focusing on "HACCP", held in San Antonio, Texas. For more information contact the Communications department, the National Fisheries Institute, 2000 M St., NW Suite 580, Washington, DC 20036, (202) 296-3428.

15-19, Applications and Troubleshooting Microprocessor Control Circuits Seminar, presented by The American Institute of Baking. To register, write to American Institute of Baking, 1213 Bakers Way, Manhattan, KS 66502, call 913-537-4750 or 800-633-5137, or FAX 913-537-1493.

15-26, Baking for Allied & Non-Production Personnel. American Institute of Baking, Manhattan, KS. Contact: Melinda Enns at (913) 537-4750.

17-19, 5TH Annual Biotechnology Process Engineering Symposium at the Massachusetts Institute of Technology. For more information contact: Biotechnology Process Engineering Center, Conference Coordinator, M.I.T., Room 20A-207, Cambridge, MA 02139.

17-20, Sixth Annual U.S. Dairy Forum at the PGA Sheraton Resort in Palm Beach Gardens, Florida. For more information contact the Milk Industry Foundation, 888 Sixteenth St. N.W., Washington, D.C. 20006, 202/296-4250.

29-31, Baking Production Technology. American Institute of Baking, Honolulu, HI. Contact: Melinda Enns at (913) 537-4750.

29-Feb. 1, Basic Food Processing Sanitation. American Institute of Baking, Manhattan, KS. Contact: Melinda Enns at (913) 537-4750.

31-Feb. 1, Food Processors' Sanitation Workshop, at the Holiday Inn, Santa Nella, CA. Presented by the University of California Cooperative Extension and Food Processors' Sanitation Association, along with representatives of various food trade associations. For more information, contact Joan

Byers, Food Science and Technology, University of California, Davis, CA 95616, (916) 752-1478.

FEBRUARY

5-June 15, Baking Science and Technology #136. American Institute of Baking, Manhattan, KS. Contact: Melinda Enns at (913) 537-4750.

5-9, Specialized Cookie Production. American Institute of Baking, Manhattan, KS. Contact: Melinda Enns at (913) 537-4750.

6-9, Freezing Technology Course for the Frozen Food Industry, at the University of California, Davis. For more information contact Robert C. Pearl or Sharon Munowitch, University Extension, University of California, Davis, CA 95616, (916) 757-8899.

12-16, Bakery Management. American Institute of Baking, Manhattan, KS. Contact: Melinda Enns at (913) 537-4750.

13-14, 79th Annual Oregon Dairy Industries Conference held at the Hilton Hotel, Eugene, OR. For more information call Floyd W. Bodyfelt, 503-737-3463.

14-15, Dairy and Food Industry Conference, The Ohio State University, Department of Food Science & Nutrition, 2121 Fyffe Road, Columbus, OH 43210-1097. For more information contact Dr. John Lindamood, (614) 292-7765.

16, Georgia Association of Food & Environmental Sanitarians (GAFES) Annual Meeting, at the Airport Holiday Inn, I-85 So, Atlanta, GA. Topics: Sanitation for the 90's. For more information call Joseph Frank, 404-542-2453.

19-21, ABC Research 16th Annual Technical Seminar, University Centre Hotel, Gainesville, FL 32608. For additional information contact Sara Jo Atwell, 904-372-0436.

24-28, The Texas Public Health Association's 65th Annual Meeting in Austin, Texas at the Hyatt Regency Hotel on Town Lake. Contact either Ms. Terri Pali, TPHA Executive Secretary, (512) 451-1846, or Jim Allen, Chairman Exhibit Procurement Committee, (512) 458-7500.

26-28, Kentucky Association of Milk, Food and Environmental Sanitarians' Annual Conference to be held at the Holiday Inn South on Fern Valley Road, Louisville, KY. For more information, contact Debbie Pierce, Secretary, KAMFES, PO Box 1464, Frankfort, KY 40602, (502) 564-3340.

MARCH

6-7, Virginia Association of Sanitarians & Fieldmen Annual Meeting, Donaldson Brown Continuing Education Center, Blacksburg, VA. For more information contact Haney Hodges, 1328 Biscayne Rd. N.W., Roanoke, VA 24019, 703-362-8877.

6-8, Idaho Environmental Health Association Annual Meeting in Boise, ID. Topics to be addressed will be various Environmental Health Concerns. For more information contact Tom Turco, 1455 N. Orchard, Boise, ID 83706, 208-375-5230.

11-12, 1990 Pittsburgh Restaurant Food & Equipment Show, sponsored by the Pennsylvania Restaurant Association. Held in Pittsburgh at the Expo Mart, Monroeville. Call 1-800-346-PROS or (717) 697-4199 for details, FAX (717) 790-9441.

14, Indiana Dairy Industry Conference, sponsored by the Food Science Department at Purdue University. For information contact James V. Chambers, Food Science Department, Smith Hall, Purdue University, West Lafayette, IN 47907, 317-494-8279.

18-20, Monterey Wine Festival, at the Monterey Conference Center, Monterey, CA. For more information contact The Monterey Wine Festival, c/o The National Restaurant Association, 150 N. Michigan Ave. Ste. 2000, Chicago, IL 60601, 312/853-2525, FAX 312/853-2548.

19-23, Mid-West Workshop in Milk and Food Sanitation, The Ohio State University, Department of Food Science & Nutrition, 2121 Fyffe Road, Columbus, OH 43210-1097. For more information contact Dr. David Dzurec, (614) 292-7723.

28-30, Michigan Environmental Health Association's 1990 Annual Education Conference at Holiday Inn, Holland, Michigan. For more information contact K. Durwood Zank, R.S., P.O. Box 277, DeWitt, MI 48820-0277, 517-543-2430.

APRIL

4, 40th Annual University of Maryland Ice Cream Conference. Contact Dr. James T. Marshall, Department of Animal Sciences, University of Maryland, College Park, Maryland 20742 (or call 301/454-7843).

4, Ohio Association of Milk Food & Environmental Sanitarians Spring Meeting, Park University Hotel, Columbus, OH. For more information write or call Donald Barrett, Health Dept., 181 S. Washington Blvd., Columbus, OH 43215, 614-645-6195.

4, 5, 6, Missouri Milk, Food & Environmental Health Association Annual Meeting, Breckenridge on the Lake, Osage Beach, MO. For more information contact John Norris, Division of Health, Box 570, Jefferson City, MO 65101, 314-751-6400.

10-12, Florida Association Milk Food & Environmental Sanitarians Annual Meeting, at the Hilton Hotel, Deland, Florida. For more information contact Dr. Ron Schmidt, University of Florida Food Science and Human Nutrition, Gainesville, FL 32611, 904/392-8003.

11-12, Florida Association Milk Food & Environmental Sanitarians Spring Educational Conference, Deland FL, Hilton Hotel. For more information contact W.R. Thornhill, 3023 Lake Alfred Rd., Winter Haven, FL 33881, 813-299-6555.

22, 23, & 24, 1990 Philadelphia Restaurant Food & Equipment Show, sponsored by the Pennsylvania Restaurant Association. Held in Philadelphia at the Valley

Forge Convention Center, King of Prussia. Call 1-800-346-PROS or (717) 697-4199 for details, FAX (717) 790-9441.

25, 26, Dairy Products Technical Conference at the O'Hare Marriott in Chicago, Illinois. Co-sponsored by The Center for Dairy Research (Madison, Wisconsin) and the American Dairy Products Institute (Chicago, Illinois). For more information contact Sarah Quinones (CDR) at 608/262-2217 or Dr. Warren S. Clark, Jr. (ADPI) at 312/782-4888.

MAY

1-2, Harrisburg Restaurant Food & Equipment Show, sponsored by the Pennsylvania Restaurant Association. Held in Harrisburg at the Farm Show Complex, Harrisburg. Call 1-800-346-PROS or (717) 697-4199 for details, FAX (717) 790-9441.

7-11, Electrical Troubleshooting. American Institute of Baking, Manhattan, KS. Contact: Melinda Enns at (913) 537-4750.

14-16, 1990 Pennsylvania Association of Dairy Sanitarians & Dairy Laboratory Analysts Annual Meeting at the Keller Conference Center, Penn State University, University Park, PA. For more information, contact Sid Barnard, 8 Borland Lab, University Park, PA 16802, 814-863-3915.

14-17, Purdue Aseptic Processing and Packaging Workshop, sponsored by the Food Science Department at Purdue University. For information contact James V. Chambers, Food Science Department, Smith Hall, Purdue University, West Lafayette, IN 47907, 317-494-8279.

14-18, Applications and Troubleshooting Microprocessor Control Circuits Seminar, presented by The American Institute of Baking. To register, write to American Institute of Baking, 1213 Bakers Way, Manhattan, KS 66502, call 913-537-4750 or 800-633-5137, or FAX 913-537-1493.

19-23, The 71st Annual National Restaurant Association Restaurant, Hotel-Motel Show, held at McCormick Place, Chicago, IL. For more information contact National Restaurant Association, 150 N. Michigan Ave., Ste. 2000, Chicago, IL 60601, 312/853-2525, FAX 312/853-2548.

23, 25, 25, South Dakota Environmental Health & South Dakota Rural Health, Ramkota Inn, Pierre, SD. For information contact Dave Micklos, SD State Dept of Health, 523 E. Capital, Pierre, SD 57501, 605-773-3141.

JUNE

5-6, Texas Association of Milk, Food & Environmental Protection Annual Meeting, held at the Howard Johnson-South Plaza, Austin, Texas. For more information contact Janie Park, Secretary, P.O. Box 2363, Cedar Park, TX 78613-2363, 512-458-7281.

JULY

6-7, International Symposium on Rapid Methods and Automation in Microbiology: Ten Years of Excellence. Contact Dr. Daniel Y.C. Fung, Director, 207 Call Hall,

Kansas State University, Manhattan, Kansas 66506. Telephone (913) 532-5654, FAX (913) 532-7059.
6-13, International Workshop on Rapid Methods and Automation in Microbiology: Ten years of Excellence. Contact Dr. Daniel Y.C. Fung, Director, 207 Call Hall, Kansas State University, Manhattan, Kansas 66506. Telephone (913) 532-5654, FAX (913) 532-7059.

AUGUST

15-18, FOOD PACIFIC, 1990 will be held at Vancouver's domed stadium, B.C. Place. Those wishing to attend may obtain further information by contacting: B.C. Food Exhibitions Ltd., 190-10651 Shellbridge Way, Richmond, B.C., Canada V6X 2W8 (604) 660-2288.

26-31 Eighth International Biodeterioration and Biodegradation Symposium, University of Windsor, Ontario, Canada. For more information contact Mary M. Hawkins, Corresponding Secretary, 10657 Galaxie, Ferndale, MI 48220-2133, 313-544-0042.

SEPTEMBER

10-13, 104th Annual International Meeting & Exposition, to be held at the Clarion Hotel, New Orleans, Louisiana. For more information, contact: Margaret Ridgell, AOAC, Suite 400, 2200 Wilson Blvd., Arlington, VA 22201-3301 (703) 522-3032.

18-20, New York State Association of Milk and Food Sanitarians Annual Meeting, at the Sheraton Inn-Syracuse, Liverpool, NY. For more information contact Paul Dersam, 27 Sullivan Rd., Alden, NY 14004, 716-937-3432.

26, 27, 28, Kansas Association of Sanitarians Annual Meeting, Red Coach Inn, Salina, KS. For more information contact John Davis, 1900 East 19th, Wichita, KS 67214, 316-268-8351.

OCTOBER

7-12, Twenty-Third International Dairy Congress, sponsored by the International Dairy Federation, and **Exposition 1990**, will be held at the Montreal Convention Centre, Montreal, Canada. For further information, contact: Richard Stern, Executive Director, International Dairy Congress, 1990, PO Box 2143, Station D, Ottawa, Ontario, Canada K1P 5W3 (613) 238-4116.

NOVEMBER

6-8, International Cheese Technology Exposition will be held in Milwaukee, Wisconsin. For further information, contact: USCMA/WCMA, P.O. Box 2133, Madison, Wisconsin, 53701, (608)255-2027.

DECEMBER

12-18, American Society of Agricultural Engineers will be sponsoring the International Symposium on Agricultural and Food Processing Wastes. For more information

contact: Jon Hiler, American Society of Agricultural Engineers, 2950 Niles Road, St. Joseph, MO 49085 616/429-0300.
1991

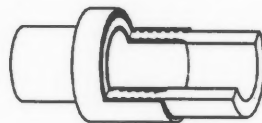
JANUARY

22-23, Third Annual Southern California Food Industry Conference will be held on the campus of Chapman College in Orange, California. For more information contact: Walt Clark, Chapman College, Food Science & Nutrition Department, Orange, CA 92666 PH: (714) 997-6869 FAX: (714) 532-6048 or Patrick Cochran, La Loma Foods, P.O. Box 8863, Riverside, CA 92515 PH: (714) 351-4300 FAX: (714) 351-3635.

To insure that your meeting time is published, send announcements at least 90 days in advance to: IAMFES, PO Box 701, Ames, IA 50010.

Totally Sanitary

The EZ-FLO Food Hose Assembly



Totally Sanitary from one end to the other. No crevices to harbor bacteria. No ledges to restrict flow. The USDA and FDA accepted **EZ-FLO** food hose assembly provides a sanitary processing environment for your product.

Totally Convenient with permanently installed CIPable ends. No taking apart for cleaning like hoses with clamped in fittings. Saves time and money.

Want more information? Call us today. You'll be **Totally Satisfied**.

**NELSON
&
JAMESON**

Nelson-Jameson, Inc.
2400 E. 5th St., Marshfield, WI 54449
Phone 715/387-1151 • FAX 715/387-8748

phone toll free 800-826-8302

Please circle No. 142 on your Reader Service Card

IAMFES

International Association of Milk, Food and Environmental Sanitarians, Inc.

MEMBERSHIP/SUBSCRIPTION APPLICATION

MEMBERSHIP

- Membership with BOTH journals \$64
(*Dairy, Food and Environmental Sanitation* and the
Journal of Food Protection)
- Membership with *Dairy, Food and Environmental Sanitation* \$36
- Check here if you are interested in information on joining your
state/province chapter of IAMFES

SUSTAINING MEMBERSHIP

- Membership with BOTH journals \$375
Includes table top discount, July advertising discount, company
monthly listing in both journals and more.

STUDENT MEMBERSHIP

- Membership with BOTH journals \$32
- Membership with *Dairy, Food and Environmental Sanitation* \$19
- Membership with the *Journal of Food Protection* \$19
Student verification must accompany this form

SUBSCRIPTIONS

for agencies, libraries, associations, institutions

- BOTH journals \$151
- Dairy, Food and Environmental Sanitation* \$83
- Journal of Food Protection* \$110

**POSTAGE CHARGES: Outside the U.S. add \$12 per journal surface rate or \$75
per journal AIRMAIL ordered. U.S. funds only, drawn on U.S. Bank.**

3-A Sanitary Standards

3-A Sanitary Standards

- Complete set 3-A Dairy Stds ea \$33
- Complete set 3-A Dairy & Egg Stds ea \$48
- 3-A Egg Stds ea \$28
- Five-year Service on 3-A Sanitary Standards
- 3-A Dairy & Egg Stds Five years \$44

"Procedures" Booklets

- Procedures to Investigate Waterborne Illness ea \$5.00
- Procedures to Investigate Foodborne Illness - **new 4th Edition** ea \$5.00
- Procedures to Investigate Arthropod-borne and Rodent-borne Illness ea \$5.00

Multiple copies available at reduced prices. Prices include postage.

PRINT OR TYPE ... ALL AREAS MUST BE COMPLETED IN ORDER TO BE PROCESSED

Name _____ Company Name _____

Job Title _____ Office Phone # _____

Address _____

City _____ State/Province _____ Country _____ Zip _____

Renewal _____ New Membership/Subscription _____

**PAYMENT MUST BE ENCLOSED
IN ORDER TO PROCESS**

MAIL ENTIRE FORM TO:

IAMFES DEPT. S
P.O. BOX 701
AMES, IA 50010

OR USE YOUR CHARGE CARD 1-800-525-5223
515-232-6699
FAX 515-232-4736

- ___ CHECK OR MONEY ORDER
- ___ MASTER CARD
- ___ VISA
- ___ AMERICAN EXPRESS

U.S. FUNDS

CARD # _____

EXP. DATE _____

YOUR SIGNATURE _____

From the Ames Office . . .

By
Steven K. Halstead
IAMFES
Executive Manager



Living as I do, just 20 miles from Newton, the home of Maytag Washers, I have watched with great interest over the years, their various ad campaigns. I always liked the "Loneliest Repairman" series. The poor guy had nothing to do, because, the ad goes, Maytags never break down.

While teaching high school physics, I had a great sense of identity with "Old Lonely". Not because I didn't have anything to do, but because I was lonely. I was the only physics teacher. There was no one in the building to talk to about physics. There was no one to complain to about the cuts in my equipment budgets. There was no one with whom to discuss new teaching methods and materials.

Luckily, there was a group of physics teachers in Central Iowa who felt the same loneliness I did. We decided to do something about it. We formed the Central Iowa Teachers of Physics.

We got together about 3 times a year to just simply share. We shared problems. We shared successes. We shared complaints. We shared methods. In short, we developed an association.

It didn't have journals or annual meetings. It didn't have insurance programs or low cost car rental programs. But, it did have the most important benefit any association can offer its members. It had camaraderie.

It gave us the opportunity to talk with others who faced on a daily basis, the same kinds of experiences. It ended loneliness.

As I travel to our affiliate meetings, I find the sense of camaraderie alive and well in IAMFES. I find this encouraging and gratifying, because it means we will continue to grow and prosper.

I invite you to be a part of that growth and progress. Surely you know a sanitarian who is lonely. Invite them into the warmth of IAMFES membership. Someday, they'll thank you for it.

IAMFES

International Association of Milk, Food and Environmental Sanitarians Inc

DFES
JFP
12/89
1/90

Reader requests for information are sent to the appropriate company. Follow-up on reader requests are the responsibility of the company advertising.

To receive information on membership with IAMFES Circle 360 on this card

The Advertisements included herein are not necessarily endorsed by the International Association of Milk, Food and Environmental Sanitarians, Inc.

Name _____ Title _____
 Company _____
 Address _____
 City _____ State/Prov. _____
 Country _____ Zip _____
 Phone Number _____

Please send information on items circled below: Deadline 60 days from issue date

101	114	127	140	153	166	179	192	205	218	231	244	257	270	283	296	309	322	335	348
102	115	128	141	154	167	180	193	206	219	232	245	258	271	284	297	310	323	336	349
103	116	129	142	155	168	181	194	207	220	233	246	259	272	285	298	311	324	337	350
104	117	130	143	156	169	182	195	208	221	234	247	260	273	286	299	312	325	338	351
105	118	131	144	157	170	183	196	209	222	235	248	261	274	287	300	313	326	339	352
106	119	132	145	158	171	184	197	210	223	236	249	262	275	288	301	314	327	340	353
107	120	133	146	159	172	185	198	211	224	237	250	263	276	289	302	315	328	341	354
108	121	134	147	160	173	186	199	212	225	238	251	264	277	290	303	316	329	342	355
109	122	135	148	161	174	187	200	213	226	239	252	265	278	291	304	317	330	343	356
110	123	136	149	162	175	188	201	214	227	240	253	266	279	292	305	318	331	344	357
111	124	137	150	163	176	189	202	215	228	241	254	267	280	293	306	319	332	345	358
112	125	138	151	164	177	190	203	216	229	242	255	268	281	294	307	320	333	346	359
113	126	139	152	165	178	191	204	217	230	243	256	269	282	295	308	321	334	347	360

IAMFES

International Association of Milk, Food and Environmental Sanitarians Inc.

DFES
JFP
12/89
1/90

Reader requests for information are sent to the appropriate company. Follow-up on reader requests are the responsibility of the company advertising.

This second Reader Service Card is provided to allow co-workers to also respond to companies of interest.

The Advertisements included herein are not necessarily endorsed by the International Association of Milk, Food and Environmental Sanitarians, Inc.

Name _____ Title _____
 Company _____
 Address _____
 City _____ State/Prov. _____
 Country _____ Zip _____
 Phone Number _____

Please send information on items circled below: Deadline 60 days from issue date

101	114	127	140	153	166	179	192	205	218	231	244	257	270	283	296	309	322	335	348
102	115	128	141	154	167	180	193	206	219	232	245	258	271	284	297	310	323	336	349
103	116	129	142	155	168	181	194	207	220	233	246	259	272	285	298	311	324	337	350
104	117	130	143	156	169	182	195	208	221	234	247	260	273	286	299	312	325	338	351
105	118	131	144	157	170	183	196	209	222	235	248	261	274	287	300	313	326	339	352
106	119	132	145	158	171	184	197	210	223	236	249	262	275	288	301	314	327	340	353
107	120	133	146	159	172	185	198	211	224	237	250	263	276	289	302	315	328	341	354
108	121	134	147	160	173	186	199	212	225	238	251	264	277	290	303	316	329	342	355
109	122	135	148	161	174	187	200	213	226	239	252	265	278	291	304	317	330	343	356
110	123	136	149	162	175	188	201	214	227	240	253	266	279	292	305	318	331	344	357
111	124	137	150	163	176	189	202	215	228	241	254	267	280	293	306	319	332	345	358
112	125	138	151	164	177	190	203	216	229	242	255	268	281	294	307	320	333	346	359
113	126	139	152	165	178	191	204	217	230	243	256	269	282	295	308	321	334	347	360

Place
Stamp
Here

IAMFES

P.O. Box 701
502 E. Lincoln Way
Ames, Iowa 50010

Place
Stamp
Here

IAMFES

P.O. Box 701
502 E. Lincoln Way
Ames, Iowa 50010

TIME-HONORED VALUES



CUTTING-EDGE TECHNOLOGY

BBL® CULTURE MEDIA

Uncompromising service. Superior quality. The choice of professionals since 1935.

**BECTON
DICKINSON**

BBL is a trademark of Becton Dickinson and Company.

Becton Dickinson Microbiology Systems
Cockeysville, MD 21030

Please circle No. 135 on your Reader Service Card.

If you're not running a Charm, you're running a risk.

You're looking at a partial list of the antibiotics and mycotoxins you can catch with the Charm test.

You are also looking at a partial list of antibiotics other tests can't detect.

So if you want to take a chance on somebody else's test, good luck.

But if you want to be sure, be sure you run a Charm.

Penicillin Assays Inc.

36 FRANKLIN STREET, MALDEN, MA 02148 TEL. (617) 322-1523

CHARM COWSIDE •

- ◆ ■ BETA-LACTAMS (P)
- ◆ ■ Penicillin BT
- ◆ ■ Penicillin G
(benzylpenicillin)
(benzathine)
(potassium)
(procaine)
(sodium)
(benethamine)
(calcium)
- ◆ ■ Penicillin O
- ◆ ■ Penicillin S
- ◆ ■ Penicillin N
- ◆ ■ Methicillin
- ◆ ■ Nafcillin
- ◆ ■ Ticarcillin
- ◆ ■ Penicillin V.
(benzathine)
(hydrabamine)
(potassium)
- ◆ ■ Oxacillin
- ◆ ■ Cloxacillin
(benzathine)
- ◆ ■ Dicloxacillin
- ◆ ■ Flucloxacillin
- ◆ ■ Ampicillin
(trihydrate)
- ◆ ■ Amoxicillin
(trihydrate)
- ◆ ■ Piperacillin
- ◆ ■ Hetacillin
- ◆ ■ Carbenicillin
- ◆ ■ Cephalothin
(Cephaloglycin)
- ◆ ■ Cephalirin
- ◆ ■ Cephalirin Benzathine
- ◆ ■ Cephradine
- ◆ ■ Cephaetrile
- ◆ ■ Cephalixin
- ◆ ■ Cephaloridine
- ◆ ■ Cefazolin
- ◆ ■ Cefoxitin
- ◆ ■ Cefaclor

CHARM TEST I ◆

- ◆ ■ Cefadroxil
- ◆ ■ Cefamandole
- ◆ ■ Cefatrizine
- ◆ ■ Cefazedone
- ◆ ■ Cefmenoxime
- ◆ ■ Cefmetazole
- ◆ ■ Cefonicid
- ◆ ■ Cefoperazone
- ◆ ■ Ceforanide
- ◆ ■ Cefotaxime
- ◆ ■ Cefotetan
- ◆ ■ Cefotiam
- ◆ ■ Cefroxadine
- ◆ ■ Cefsulodin
- ◆ ■ Ceftazidime
- ◆ ■ Ceftazole
- ◆ ■ Ceftizoxime
- ◆ ■ Ceftriaxone
- ◆ ■ Cephalosporin C
- ◆ ■ Cephamycin A
- ◆ ■ Cephamycin B
- ◆ ■ Cephamycin C
- ◆ ■ Cephalirin Sodium
- ◆ ■ Cephadrine

TETRACYCLINES (T)

- Tetracycline
- Chlortetracycline
- Oxytetracycline
- Demeclocycline
- Methacycline
- Doxycycline
- Minocycline

AMINOGLYCOSIDES (ST)

- Dihydrostreptomycin
- Streptomycin sulfate
- Neomycin
- Kanamycin
- Amikacin
- Gentamicin
- Tobramycin

CHARM TEST II ■

MACROLIDES (E)

- ■ Troleandomycin
- ■ Erythromycin
Erythromycin Stearate
Erythromycin Estolate
Erythromycin Gluceptate
Erythromycin Lactobionate
Erythromycin Phosphate
- ◆ ■ Spiramycin
Erythromycin Thiocyanate
- ◆ ■ Oleandomycin
- ◆ ■ Tylosin
- ◆ ■ Lincomycin
- ◆ ■ Clindamycin

MYCOTOXINS (MY)

- Aflatoxin M₁, M₂
- Aflatoxin B₁, B₂, G₁, G₂

SULFONAMIDES (SM)

- ◆ ■ Sulfamethazine
- ◆ ■ Sulfadimethoxine
- ◆ ■ Sulfabromomethazine
- ◆ ■ Sulfamerazine
- ◆ ■ Sulfamethoxyypyridazine
- ◆ ■ Sulfasoxazole
- ◆ ■ Sulfadiazine
- ◆ ■ Sulfapyridine
- ◆ ■ Sulfacetamide
- ◆ ■ Sulfamethizole
- ◆ ■ Sulfanilamide
- ◆ ■ Sulfaguanidine
- ◆ ■ Dapsone
- ◆ ■ Sulfamethoxazole
- ◆ ■ Sulfachloropyridazine
- ◆ ■ Sulfantran
- ◆ ■ Sulfaquinoxaline
- ◆ ■ Sulfathiazole

NOVABIOCIN (N)

- ◆ ■ CHLORAMPHENICOL (C)

Please circle No. 185 on your Reader Service Card

