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DAIRY, FOOD AND ENVIRONMENTAL

SANITATION

JULY 1989

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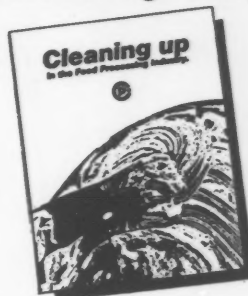
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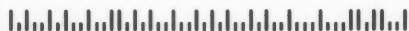
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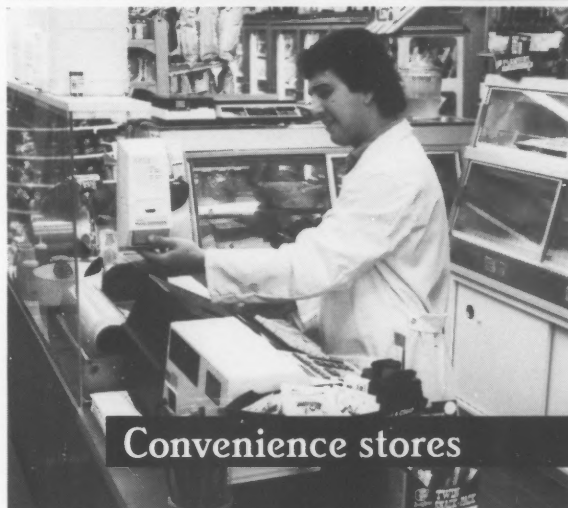
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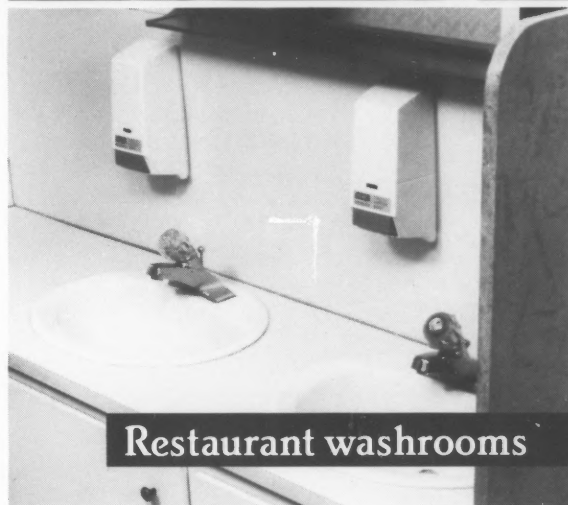




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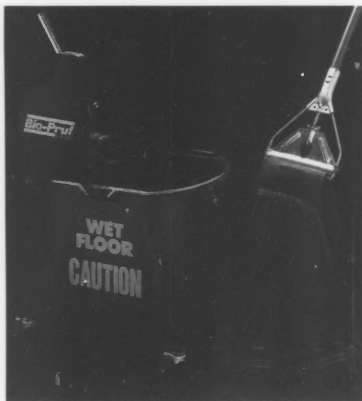
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THE EDUCATIONAL FOUNDATION

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LacTek™ assays are now available for beta-lactams as well as sulfamethazine with a panel of four new tests soon to come.

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♦ Teri Brock, Manager of Technical Services, is one of the professional representatives available to demonstrate LacTek™...Idetek's fast, easy and cost-effective alternative for testing for beta-lactam antibiotics in milk.

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IAMFES Annual Meeting Booth 47

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Thoughts From the President . . .

The month of July brings to mind vacations, picnics, barbecues, visits with family and friends, and many other pleasant summertime experiences. For many food protection professionals, the seventh month of the year is also a reminder that the IAMFES Annual Meeting is "just around the corner".

As you know, our 76th Annual Meeting is scheduled for August 13-17, 1989 at the beautiful Hyatt Regency Crown Center in Kansas City, Missouri. Program Chairman, Ron Case, along with Ed Zottola, Program Advisory Committee Chair and a hard-working committee made up of Gale Prince, John Bruhn, Mark Banner, Darrel Bone, Ann Draughton, Jim Marshall, Bob Richardson, Russell Bishop, Bill Coleman, Ellen Koenig and Ewen Todd have planned a truly outstanding scientific program. It is the most ambitious program ever planned for our association. There are over nineteen symposia and technical sessions on a variety of topics such as:

- A National View of Food Safety
- Food Microbiology and Toxicology
- Modernizing the Dairy Plant
- Seafood Quality and Safety Concerns
- Dairy Quality
- The Solid Waste Challenge
- Unique Disease Vectors
- Residual Chemicals in Milk and Dairy Foods
- Environmental Concerns
- A Product Tampering Update
- *Salmonella enteritidis* and Eggs
- Education and Training
- Pest Control
- Laboratory Methods
- Emergency Health and Safety Issues in Child Care Facilities

There will also be over 60 table top educational exhibits and an opportunity to visit with a wide variety of suppliers. Don Bechtel and his colleagues in the Kansas Affiliate have done an excellent job of designing the special events program and arranging for a truly delightful Kansas City Experience.

Our 76th Annual Meeting promises to be the best ever and you should consider being a part of this excellent conference. Why, you ask? Well, here are some very good reasons to attend.

(1) *Meet old friends and make new ones.*

Our meeting still provides many opportunities for people to mingle, talk, exchange ideas, do business and learn about the latest developments in the field of food protection, milk, food and environmental safety and sanitation. The IAMFES Annual Meeting is large enough to attract industry, academic and regulatory experts while small enough to provide a relaxed atmosphere and a forum for interaction. The long standing tradition of the meeting being a "family meeting" is one of the benefits of attending. Many members bring their spouses and families and have made the session an annual event.

(2) *Professional Education.*

By attending the technical presentations and listening to research papers and specific symposia topics, you will be able to

By
Robert B. Gravani, Ph.D.
IAMFES President



bring back new ideas and state of the art information to your employer. You will also have an opportunity to discuss and debate key issues with speakers and other conference attendees.

(3) *Commitment to a viable and growing organization.*

IAMFES is growing, so by your attendance and active participation, you are reinforcing the importance of IAMFES as one of the major organizations for Dairy, Food and Environmental Protection in the US.

If you haven't been convinced yet, talk with a friend or colleague who has attended a recent annual meeting, and they will reinforce my comments.

Why not take a few minutes to complete the preregistration materials in this issue of the Journal to secure the lowest prices for conference events and to assure a room at the hotel. In the past several years, our main hotels have been full and late registrants were forced to stay in other locations.

Preregistrations for the meeting are going very well and we're hoping for an attendance of over 900 professional members.

IAMFES Secretary

The votes for IAMFES Secretary have been cast and counted and the winner is . . . Dr. Michael P. Doyle of the Food Research Institute at the University of Wisconsin-Madison.

I know that all members join me in congratulating Mike and wishing him much success in his tenure on the executive board. Dr. Bob Brackett, the other candidate for secretary, deserves a special thank you for running for this important office. The board members look forward to welcoming Mike Doyle to his first board meeting during our August convention.

IAMFES Executive Manager Search

The search for a new Executive Manager of IAMFES is proceeding very well. Over 60 candidates have applied for the position and your executive board is actively involved in screening these applications to select a highly qualified manager. A new manager will be named as soon as possible. Stay tuned for a further update on this very important matter.

Enjoy the rest of July and I look forward to seeing you at the Annual Meeting in August!

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ABC Research, Gainesville, FL

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Dairy, Food and Environmental Sanitation

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ABOUT THE COVER . . . *Skyline of beautiful Kansas City, MO the site for the 76th IAMFES Annual Meeting.*

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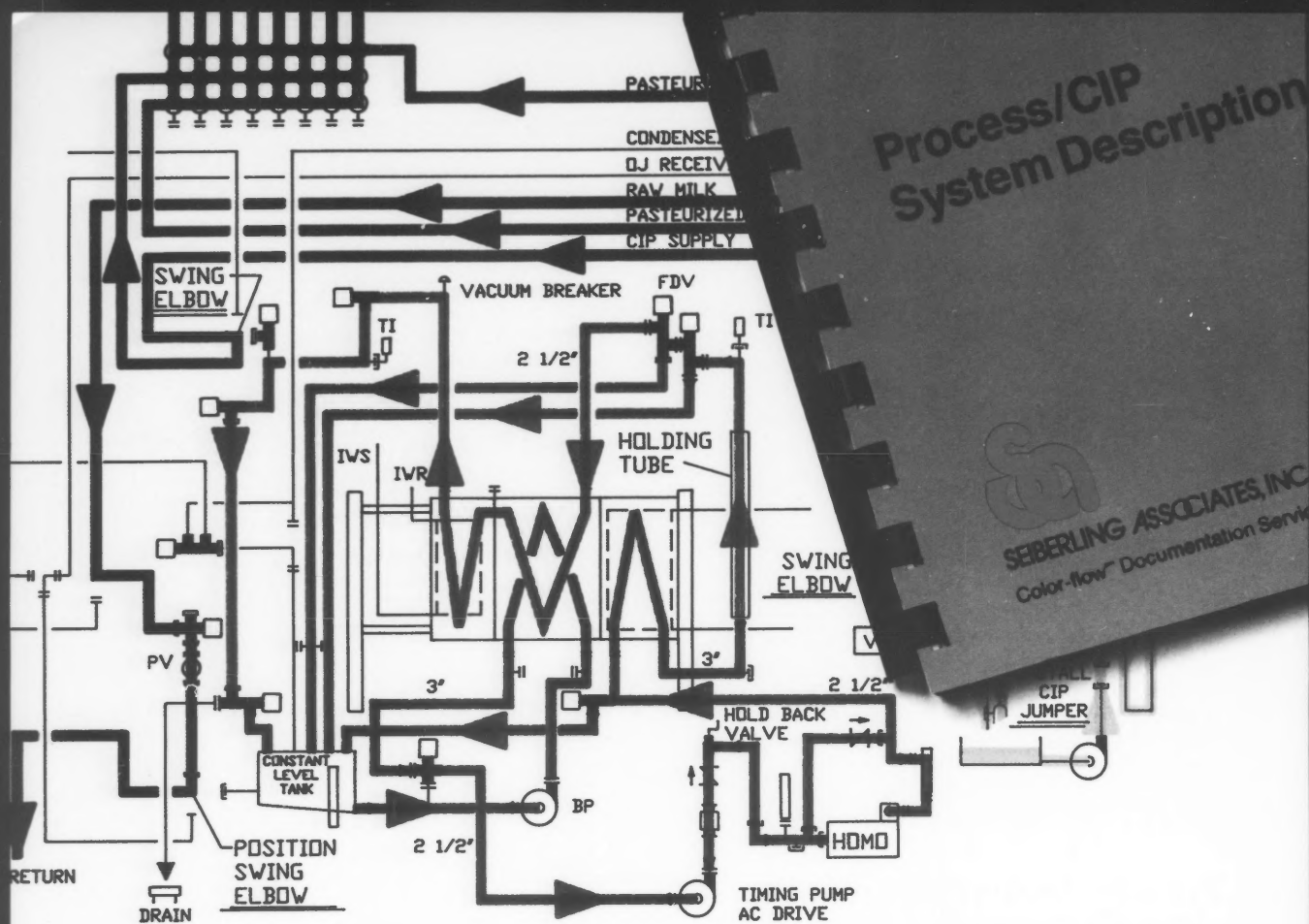
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- **Review piping for compliance** and make recommendations for corrective action where needed. Various options may be presented taking into account specific needs.

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Guidelines for Satisfactory Food Protection and Sanitation Practices

George H. Reed, Jr., M.P.H.

University of Massachusetts at Amherst, Sr. Environmental Health Specialist, Division of Environmental Health and Safety,
University Health Services N 414 Morrill Science Center, Amherst, MA 01003

EATING FOOD PREPARED BY SOMEONE ELSE IS A MATTER OF TRUST.

-From a National Sanitation Foundation Ad

It is essential that food service personnel protect the health of consumers. They have the responsibility of working in an efficient and safe manner. They have a responsibility to prevent foodborne illness by practicing clean work habits and following acceptable sanitary procedures, thus creating a sanitary environment. Management has the responsibility of training personnel (with the help of health authorities) in acceptable personal hygiene habits and in sanitary techniques of food handling, with careful (and constant) supervision. These guidelines offer some basics for good food protection and sanitation practices.

I. SAFE FOOD SOURCES

1. Do Not use home-processed or home-prepared foods.
2. Know where foods come from (reputable distributor, supplier, manufacturer).
3. Inspect food supplies when delivered for temperature, swelled or damaged cans and packages, odor, visible mold, insect infestation, etc.
4. Eggs: no checked or cracked eggs purchased; only pasteurized dry, frozen, or liquid eggs purchased.

II. DRY STORAGE (food, equipment, supplies)

1. Rotate stock, "first-in, first-out" (FIFO); create some system, such as dating.
2. Store at least six (6) inches off floor.
3. Loose and unwrapped food or food where original package broken should be stored in pest proof containers or tied plastic bags, properly identified (labeled).
4. Area cool, well ventilated, well lightened, and well maintained; kept clean, neat and orderly.
5. Single service items stored properly.
6. Keep foods and all toxic chemicals in well-marked cabinets.
7. Clean spilled food off shelves or floor immediately.

III. Refrigeration Storage (walk-in and reach-in)

1. Temperature at 45 degrees F. or below; thermometer in every unit, checked frequently.

2. Potentially hazardous food stored in chillable quantities (i.e. shallow containers with food no more than 4 inches in depth) and uncovered while food is still warm (cover food when cooled below 45 degrees F.).

3. Storage practices on shelving allow for adequate air circulation; open wired shelves rather than solid (not covered with foil).

4. Raw food stored apart and below prepared food; better to store raw food in separate unit if available.

5. Food stored at least six (6) inches off floor; no stacking of containers.

6. Food stored in a manner to permit "first-in first-out".

7. Clean units frequently, at least weekly, to prevent dirt and microorganisms from accumulating.

8. Cover foods to protect from drippings, odors, drying out.

9. Refrigerate leftovers as soon as possible; throw away food not going to be used.

IV. Freezer Storage (walk-in and reach-in)

1. Temperature 0 degrees F. or below; thermometer in each unit, checked frequently.

2. All food containers covered. Wrap all food well to prevent freezer burn.

3. Food stored to allow adequate air circulation; not packed too tightly.

4. Food not stored on floor of walk-in.

5. Defrosted routinely to eliminate ice buildup.

6. Units clean, free of debris.

7. Foods rotated to permit "first-in, first-out".

V. Personal Hygiene

1. Keep the hands clean. Wash as frequently as necessary. Wash with warm, soapy water, using friction action, and dry with paper towels or air dryer. Always wash:

- a. after using toilet facilities;
- b. between handling raw and cooked foods to avoid cross-contamination;

- c. after blowing the nose, sneezing, or coughing;

- d. after smoking, eating, drinking, or taking any break;

- e. after touching the face or hair, including a beard or moustache.

2. Keep fingernails clean and well-trimmed.

3. Keep uniform clean; use a clean apron.

4. Keep hair neat and clean; use hair restraints (caps/hairnets). No long hair. Beards and moustaches kept trimmed.

5. No **SMOKING** or **EATING** in food preparation,

serving or storage areas; use designated areas.

6. No rings (except wedding band) or jewelry on hands or wrists.

7. Handling food (ice) minimized; use utensils or plastic gloves to eliminate unnecessary hand contact with prepared foods (example, do not mix salad and sandwich spread ingredients by hand).

8. If sick (especially with diarrhea, sore throat and sneezing/coughing), stay at home or go home.

9. Do not work in food preparation if a hand injury has resulted in a wound, infected cut or burn.

VI. Food Preparation, Handling, Holding

1. Potentially hazardous food kept cold (below 45 degrees F.) or hot (above 140 degrees F.); not held at room temperature, except during necessary preparation (should not exceed 2 hours).

2. Foods prepared on approved, clean, sanitized surfaces, with clean, sanitized equipment and utensils.

3. Defrost food properly - under refrigeration, under cool running water, in a microwave oven, or cooked directly; not left to defrost at room temperature.

4. Fruits and vegetables washed prior to preparation.

5. Foods covered or protected from contamination (dust, sneezing, coughing).

6. Raw, cooked or ready-to-serve food not prepared on same work surface(s) (cutting board) without proper cleaning and sanitizing between uses.

7. Preparation equipment (slicers, grinders, knives, mixers) and food contact surfaces cleaned and sanitized between changed uses.

8. Thoroughly cook all potentially hazardous foods to proper temperatures; check temperature with a metal stem thermometer.

9. Recently, eggs have presented a salmonella problem, with evidence that intact shell eggs are sometimes infected.

Some practical recommendations:

*Refrigerate shell eggs:

*Never serve raw or undercooked eggs;

*Cook eggs until the yoke and white are firm; soft scrambled, sunny-side-up, and soft cooked eggs could cause "trouble";

*In recipes calling for raw or undercooked eggs, substitute pasteurized eggs;

*Use only pasteurized egg product in high-risk settings (health care and child care facilities, etc.);

*Review menus, recipes, and food handling practices to identify inadequate cooking of egg-containing food;

*Egg rich dishes such as quiches, if stored, shall be refrigerated immediately (if quantity large, in several shallow pans for quick cooling) and use within three days;

*Review food preparation methods (and utensils used) to identify any cross-contamination problems;

*It would be desirable to give special attention in cleaning and sanitizing equipment and utensils used for raw eggs.

10. Reheat quickly to 165 degrees F.; do not use warming equipment or steam tables to do this; check temperature.

11. Microwaves tend to cook unevenly; so stir and turn

the food or food container (unless on a turntable) and check temperature.

VII. Dishwashing

1. Mechanical

a. Dishes, utensils, prescraped and prerinsed.

b. Wash temperature, 140 - 160 degrees F.

c. No overloading or improper racking.

d. Spray arms kept free of food particles and other obstructions; pumps operating properly.

e. Temperature and pressure gauges working.

f. Rinse temperature, 170 - 180 degrees F.

g. Removal from racks and sorting done in a sanitary manner.

h. Dishware and utensils air dried - no toweling.

i. Unit cleaned at least daily or more often as needed.

2. Manual

a. Prescrape and prerinse.

b. Wash - use a good detergent; wash water at 110 - 120 degrees F.

c. Rinse thoroughly with clear warm water.

d. Sanitize - hot water at 170 degrees F. or use an approved chemical (chlorine, iodophor, or quaternary ammonium ["QUATS"]) at the proper concentration.

e. Air dry - do not use towels.

VIII. Cleaning Equipment and Floors

1. It is desirable to develop (and post) a cleaning (and sanitizing) schedule of:

*What is to be cleaned.

*Who is to do the cleaning.

*When to clean (frequency: daily, weekly, monthly).

*How to clean (equipment and supplies to clean floors, hoods and filters, slicers, food-contact surfaces, etc.).

In other words, a planned sanitary maintenance program is crucial for good sanitation control. Each food service unit will have a somewhat different cleaning schedule depending on equipment use, amount of equipment, and business volume.

2. Cleaning equipment and supplies must be stored separately from food supplies.

3. Wiping cloths kept clean, rinsed in a sanitizing solution; those used for food-contact surfaces restricted to that use; do not recommend use of sponges, but thin, sponge-like wipes would be OK.

4. Clean up spills IMMEDIATELY. Clean as you do is desirable...because

*Food soil is difficult to clean when dry.

*Floors can get slippery (safety hazard).

*They can attract pests (roaches, flies, rodents).

*The surrounding floor area may be tracked up.

5. Regular and adequate cleaning (housekeeping) of a facility promotes a sanitary physical plant and equipment used in a food service operation.

IX. Pest (Roaches, Flies, Rodents) Control

1. Keep garbage containers clean (use plastic bag liners) and covered when not in continuous (actual) use.

2. Deprive pests of food and shelter by following satisfactory food protection and sanitation practices:

*Keep areas clean.

Con't. on p. 368

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Use red-bristle brushes for raw product contact areas.
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The FDA has identified the need for a well equipped and properly implemented cleaning program to prevent the need for a close plant environment extending beyond the plant walls for the propagation of bacteria to avoid cross contamination. It is recommended that the program be designed to control the spread of bacteria in the plant, particularly areas of raw, unpasteurized products. Brushes should be maintained to good condition, properly stored when not in use and washed between uses.

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Preventing brushes from traveling from one plant area to another, or from one cleaning job to another, can help control the transmission of bacteria. So, making Tri-Zone an important part of your bacteria control program, along with proper maintenance and usage of brushes, can go a long way in fighting bacteria in your food service facility or processing plant.

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con't. from p. 366

***Keep foods covered.**

***Remove unused (unnecessary) equipment.**

***Seal all junctures of walls and equipment when there is insufficient space for easy cleaning behind or between equipment (good hiding place for roaches).**

3. Prevent entry:

***Keep doors and windows tight-fitting and shut; door cracks no greater than 1/4 inch to exclude rodents.**

***Doors are self-closing.**

***Provide screens that are tight-fitting and in good repair, with screening less than 16 mesh to the inch being used.**

***KEEP WATER IN WASTE DRAINS (special problem in winter where humidity is low) to keep out rodents and roaches.**

4. Be aware of pest indicators:

***Droppings of roaches and rodents (roach and mouse droppings are somewhat similar).**

***Tracks and rubmarks of rodents along the floor and wall juncture.**

5. Extermination: should be planned with Physical Plant (pest control) personnel on a routine basis; no chemicals should be used by food service personnel for pest control activity.

6. For fly control, "fly paper" (non-chemical) could be used. No chemical resin strips are to be used.

X. CUSTOMER SERVICE

1. Serve foods on clean and sanitized dishware, handled properly.

2. Use appropriate utensils such as a serving spoon or fork, tongs or spatula to serve foods.

3. Dining area kept clean.

4. Self-serve areas monitored:

***Milk dispenser area clean and spills wiped up as necessary.**

***Salad bar display shall be supervised, with employee(s) working the operation trained in customer surveillance and product knowledge.**

***Sign displayed in salad bar area stating:**

1. that the use of hands by consumers is in violation of state law; and

2. that smoking is prohibited in the salad bar display area and adjacent areas.

*** Condiment area kept clean, spills wiped up.**

5. Clean cloths, in proper sanitizing solution, used to wipe tables.

XI. FAILURE OF EQUIPMENT

1. Close the food service establishment if:

***You have extended electrical outage or**

***Loss of water supply (or extended problems) or**

***Sewage backup problems.**

2. Be sure an ample supply of disposable dishware and utensils are on hand in case of dishwasher problems.

3. Notify health authorities; get advice and/or ask for help.



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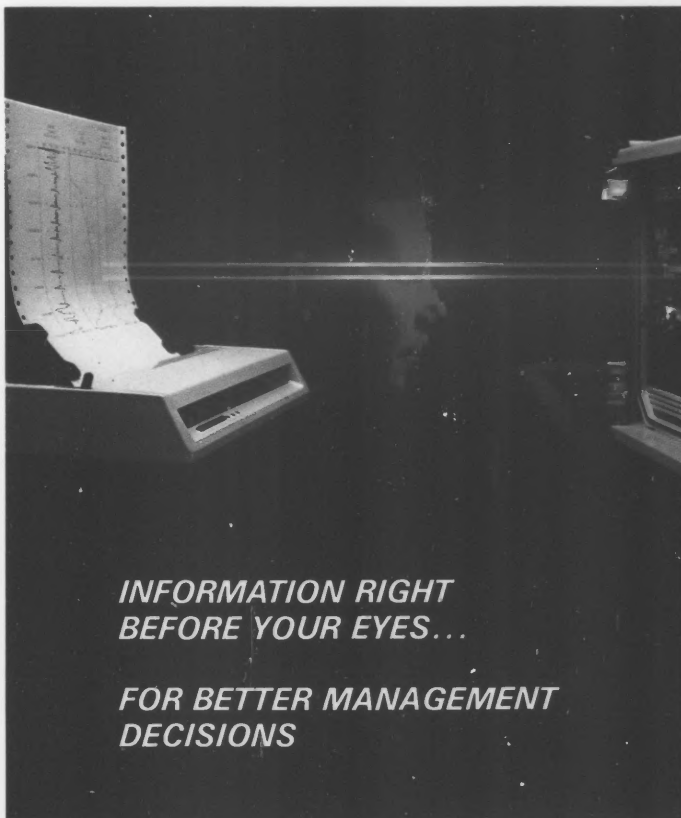
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DAIRY, FOOD AND ENVIRONMENTAL SANITATION/JULY 1989 369

Dewatering and Recovery of Anaerobically Digested Dairy Farm Solids

by

Paul R. Erickson¹ and Kenneth A. Pietila

Rexnord EnviroEnergy Technology Center Presented at the
Ag Energy Independence Day, Lincoln, Nebraska Energy Cycle Conference

Acknowledgements

Rexnord particularly appreciates the cooperation of Floyd Baum during the on-site testing.

In addition we thank Energy Cycle for making the arrangements for testing and the opportunity to apply belt press dewatering technologies to the Agribusiness fields.

Finally, acknowledgement is appropriate to Ken Pietila, our EnviroEnergy Technology Center test engineer who conducted the field tests at the Baum's Dairy Farms, Inc.

Introduction

To date the major field of application for solids dewatering has been municipal waste treatment plant sludges. To show you how major this field is in the U.S. we treat domestic waste and develop 12,000 tons/day of solids to be dewatered and disposed. Ultimately this figure will be over 31,000 T/day. A major share of these sludges are anaerobically digested - thus there are some appropriate comparative aspects of solids handling and management, when dealing with human vs animal residues. Through the 1970's it was popular to use vacuum filtration and incineration. Four major problems began to change the entire approach:

1. Energy and chemical costs increased and developed a need for use of alternative processes.
2. Air emission control of incinerators became a major concern as the EPA Clean Air Act was implemented.
3. The capital intensive incinerators became more unfavorable as EPA funding decreased.
4. Daily operation of a thermal process overtaxed operator skills and/or time. As more time was needed to control the treatment process and assure high quality effluent discharge to the receiving stream, less time was available for thermal destruction of sludge at the plant.

Thus in the last seven years there has been a major swing back to anaerobic digestion, and conversion to methane as the

major source of energy to run the treatment plant. The major problem, of course is that the anaerobic process converts approximately 50% of the organics to methane and a considerable volume of solids remains for disposal. Currently, we see a strong drive to more effectively control the anaerobic process for a higher conversion of organics to methane.

Solids dewatering of anaerobically digested animal wastes has additional incentives over municipal, organic wastes. Rexnord has initiated a program to define the most appropriate, optimized dewatering technology for controlled recovery of:

- a. Solids for use as bedding (mainly dairy) and/or protein for blended refeeding, or for use as a commercial potting soil.
- b. Filtrate for fertilizer recovery - primarily soluble phosphorus, and nitrogen mainly ammonia and organic nitrogen.

Program Approach

Dewatering devices are generically classified as follows: Vacuum Filtration, Centrifugation, Filter Press and Belt Press.

Over the last 20 years, Rexnord has acquired or developed all of these devices for use on municipal and industrial sludges. Thus expertise was accumulated in the fields on laboratory bench, field pilot and full scale operating experiences. Figure 1 shows comparative features of each device.

These features show why the belt press has taken over a major position in dewatering. It is common to see that a belt press will pay for itself as a retrofit over existing vacuum filter equipment in two years due to savings of energy, manpower, chemicals and higher solids recovery.

FIGURE 1

| DEWATERING DEVICE | OPERATING FEATURES | | | | CAKE SOLIDS DRYNESS (ORGANIC SOLIDS) | SOLIDS CAPTURE | CHEMICAL CONDITIONING |
|---------------------|----------------------|------------------|---|----------------|--------------------------------------|----------------|--|
| | CONTINUOUS OPERATION | BATCH CONTINUOUS | AVG TOTAL ENERGY REQ'D (Btu/Ton Dry Solids) | SPACE REQUIRED | | | |
| Filter Press | | X | 170 | High | High | Max. 35-45% | Maximum Normally Ferric Chloride and Lime |
| Basket Centrifuge | | X | 45 | Medium | Medium | 20-30% | Maximum Polymer |
| Decanter centrifuge | X | | 55 | Low | High | 20-30% | Average Polymer |
| Vacuum Filter | X | | 180 | Medium | Low | 15-25% | Poor Normally Ferric Chloride and Lime - Possibly Polymer |
| Belt Press | X | | 20 | Medium | Low | 15-25% | Average Polymer |

¹Director, Environmental Management, Radian Corp., 5101 W. Beloit Road, Milwaukee, Wisconsin 53214.

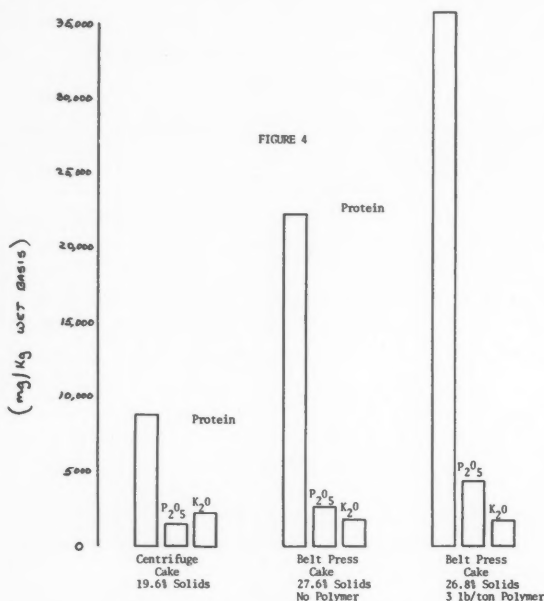


Figure 4 also illustrates the comparative protein, phosphorus, P₂O₅ and potash K₂O contents of the centrifuge and belt press cake, with and without polymer.

Overall Performance Analysis

Repetitive dewatering tests are conducted to identify controlling or ranking independent variables. Normally at least 10 runs are required to accurately establish each variable's influence on cake solids or solids recovery.

For the solids recovery for the dairy farm anaerobically digested solids we were able to establish this with relatively few runs - six in total.

Results via computer regression analysis are:

$$\text{Solids Recovery \%}, R = 17.6 P_D^{0.085} \cdot B_S^{0.34} \cdot B_T^{0.13}$$

Where P = Polymer dosage, lb/ton

B_S = Belt Speed, fpm

B_T = Belt Tension, lb/in

More useful is the fact that

Polymer Dosage influence is 51.2

while

Belt Speed is only 1.2

and Belt Tension is 0.4

Conclusions

1. Preliminary field tests on anaerobically digested dairy farm show that solids management may be significantly improved through the application of filter belt press technologies.

2. Advantages are:

- a. Dryer cake formation
- b. Higher Solids capture
 - current practice 25%
 - 35% without polymer
 - 74% with polymer
- c. Selective enhancement of cake content
 - increased protein content
 - increased P₂O₅ phosphorus content
- d. Controlled product formation
 - animal bedding
 - protein for refeed
 - fertilizer for potting soil and nursery use.

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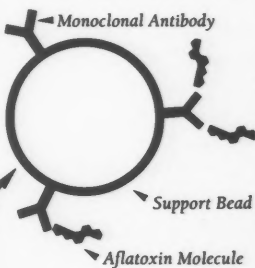
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Is Your Separator A Flow Promoting Device?

by

Thomas R. Palchak¹ and Albert N. Daugherty²

In recent years, the separator has come under close scrutiny of regulatory officials. This crucial and quite complex piece of processing equipment is central to not only standardizing fluid milk products, but also is the source of cream for frozen desserts, cultured dairy products, such as cream cheese, and as a source of skim milk for cottage cheese and yogurt.

This complex machine is made even more so by advances in separator design. Specifically, we see the development of separators which use hermetic seals, inlets which are positioned on the top of the bowl, "Micrometric" standardizing devices which are adjustable so as to achieve a wide range of standardizing dairy products, and integral centripetal pumps which convey skim and cream to other points in the milk plant. Add to this, previous developments of self-desludging bowls, paring disks for pressurized discharge, and cream concentrations for anhydrous milk-fat production, and you have a piece of processing equipment which can meet the varied needs of a modern milk or cheese plant.

The recently completed "Dairy Product Safety Initiatives and Recommended Guidelines for Controlling Environmental Contamination in Dairy Plant" by the Food and Drug Administration (FDA) have made us cognizant of the need to focus attention on our procedures for milk processing, sanitation, record keeping, and plant housekeeping. They have also heightened awareness of milk processing equipment and the possible potential to impede the pasteurization of milk through a high temperature short time (HTST) system. This is the reason the FDA began to question the basic functions of a milk separator, which heretofore wasn't fully explored or understood. The questions asked by the FDA were these: are separators flow promoting devices by virtue of their design, and are they capable of being flow promoting devices under abnormal or worse-case-scenario-type circumstances, such as mechanical or electrical failure? The incorporation of computer integrated circuitry into the main control panel of large milk plants presents additional questions. What would happen if the circuitry failed to put the system into diverted flow even though the timing and booster pumps were stopped? Could a separator located downstream of the flow diversion device (FDD) pull unpasteurized milk past the valve seats of the FDD or through a stress fracture in a plate located in the

regenerator section of a high temperature short time (HTST) pasteurizer? At Penn State's University Creamery, we decided to conduct tests in an attempt to answer these questions. First, a brief outline of our processing equipment may be helpful to better understand the tests performed.

At the Penn State Creamery, the HTST is operated by a magnetic flow, meter-based timing system accompanied by an A-C vari-drive timing pump, in place of the conventional positive displacement timing pump. The separator, a DeLaval model 390, is positioned downstream from the pasteurized side of the regenerator and upstream of the HTST's cooling system. The HTST press uses a split regenerator with approved separator by-pass valve and vacuum breaker upstream of the model 390. Anderson differential pressure controllers monitor the raw regenerator/pasteurized regenerator backpressure before and after separation. Our homogenizer, located upstream of the holding tubes, is a Gaulin Two Stage type.

Under normal operating conditions, raw pressure from the booster pump is 23 psig and pasteurized regenerator backpressure is 32-33 psig. When milk is separated, we open a valve and force pasteurized (but still uncooled) milk into the separator. Backpressure on the pasteurized side of the regenerator created by this action surges to 74 psig. Under normal operating conditions, it is clearly evident our separator negates flow rather than promotes flow. This action further indicates, physically speaking, a vacuum cannot be created when in fact the separator is creating its own pasteurized backpressure. However, the situation changes quite dramatically if a problem similar to what was described earlier occurs, i.e., mechanical, electrical, or computer failure in the milk processing equipment.

The Experiment

For purposes of testing, water was used in place of milk.

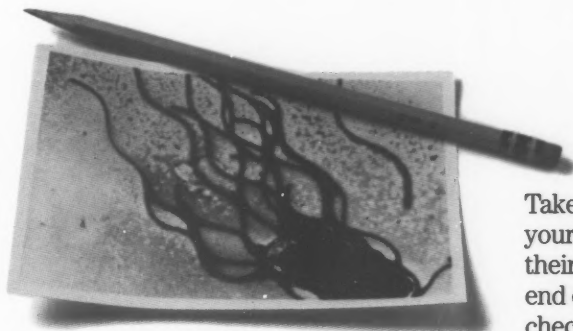
The recording thermometer at the end of the holding tube was placed in a ten gallon can of 190°F water. This temperature energized the FDD into the forward flow position, "fooling" the unit and allowing us to simulate an operating system. In place of the vacuum breaker, located upstream of the separator twelve inches above the highest raw line, we installed a laboratory test gauge which measures both vacuum and pressure. The timing pump, booster pump, and homogenizer, at zero pounds pressure, were all turned on. The system was then fully flooded and was "pasteurizing" the water in forward flow for ten minutes. Next, the valve to the separator

¹Manager, University Creamery, Dept. of Food Science, Pennsylvania State University, University Park, PA 16802

²Supervisor, Pennsylvania Dept. of Agriculture, Division of Milk Sanitation, Harrisburg, PA 17110

Cont. on p. 377

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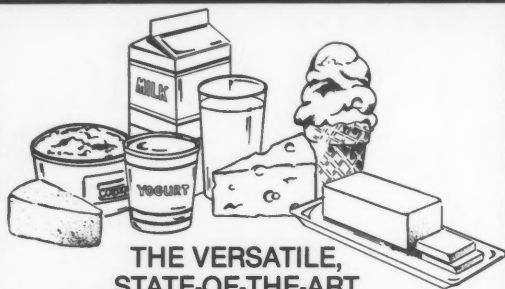
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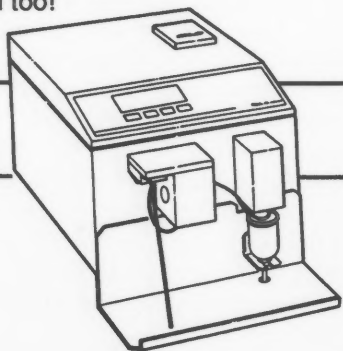
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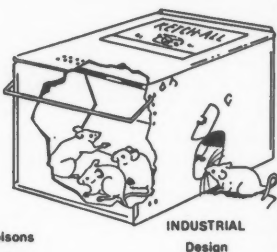
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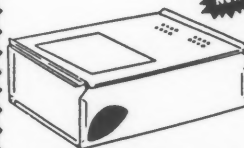
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con't. from p. 374

was energized, and the separator action soon began. With that, skim separation was simulated.

What Occurred?

As expected, the pasteurized backpressure from the separator increased to 74 psig, effectively displaying a flow negating device. With the unit in forward flow, we shut down the timing pump and booster pump. On its own power, the separator immediately dropped its backpressure to between 9 psig and 2-3 inches of mercury, (indicating vacuum). What followed was even more startling. When the homogenizer was shut down, (thereby removing all mechanical action with the exception of the separator), the centrifugal action of our separator pulled a vacuum of up to ten inches of mercury. Put another way, our separator creates enough vacuum to pull a column of water nearly eleven and a half feet high! Clearly, we see the separator acting as a flow promoting device.

These experimental tests were repeated over a dozen times over the course of two weeks, and in every instance, the separator acted as a flow promoting device.

If our relatively old separator is capable of promoting flow, how much more so are the separators which contain centripetal pumps, or impellers, capable of being flow promoting devices under abnormal circumstances?

When separating downstream from the pasteurized side of the regenerator, the very contention of the separator being a flow promoting device should be a cause of concern, if not

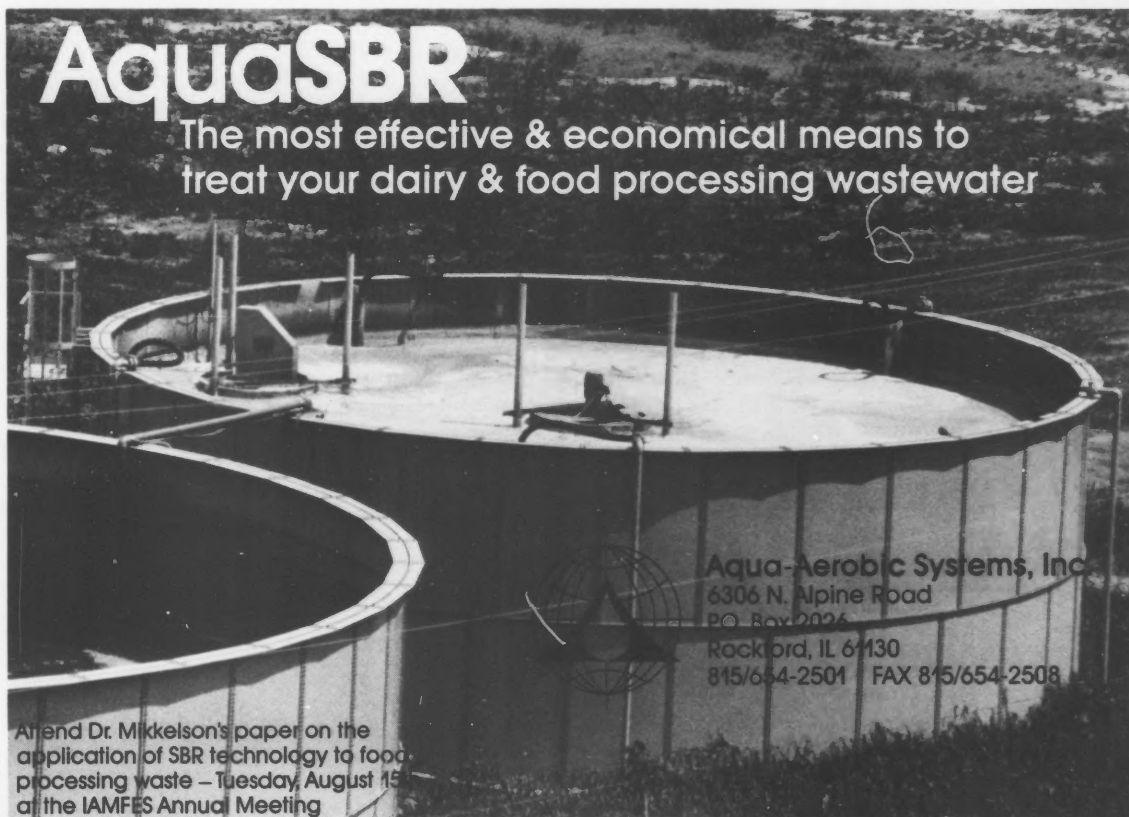
alarm, for any milk plant processor. Whether or not the vacuum is sufficient to pull unpasteurized milk past the valve seat(s) of the FDD or through a stress fracture in the regenerator section is not the issue. The mere presence of vacuum indicates a need to isolate the separator during periods of mechanical, electrical, or computer failure. We must accept the facts for what they are and valve out our separators with approved air-to-open, fail-safe valves. We must install appropriate check valves and vacuum breakers where needed or required.

Consumers place as assumed trust in dairy products that very few food processors enjoy. To violate this trust is unthinkable. We must support our regulatory officials in areas which are germane to their profession, i.e., protecting the consumer by ensuring the milk supply to all groups of people is always safe, wholesome, and nutritious. Know your equipment, understand what can and cannot occur under emergency or unfavorable circumstances. Above all, work to instill a spirit of cooperation with our regulatory officials whose charge it is to maintain the historic trust which consumers place in nature's most nearly perfect food.

The authors would like to acknowledge the assistance received from the following individuals; without their cooperation, this article could not have been published. Mr. Jerry C. Homan, HTST Operator, University Creamery, Pennsylvania State University and Mr. Matthew Burns, Dept. of Mechanical Engineering, Pennsylvania State University.

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Stop by Fluid Equipment Company Inc. Exhibit at the IAMFES Annual Meeting Booth 65

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DAIRY, FOOD AND ENVIRONMENTAL SANITATION/JULY 1989 377

FDA's Role in Control of Salmonella

The control of salmonella and other pathogens in food and feed is a top priority within FDA. Salmonella exists in man, animals, and the environment, and can pass freely from one to another. There are over 2000 salmonella serotypes which have been identified - all capable of causing disease, but each exhibiting great variation in virulence and pathogenicity. The problem of salmonella contamination of meat and poultry has existed as long as man has included meat in his food supply. Because it would seem, from a body of evidence, that many pathogens originate on the farm, the Center for Veterinary Medicine (CVM) has become an important "player" in the FDA strategy for solving these problems.

CVM's involvement in salmonella dates back to before 1972 when USDA and FDA had a joint enforcement program to lower incidence of salmonella in rendered animal and marine products. Regulatory actions which followed included several seizures and a number of injunctions. In 1972, USDA terminated this program based on cost and higher priorities and focused on slaughterhouse sanitation and education of food handlers and consumers.

FDA studied its role, without USDA, in this area and concluded that salmonella contaminated rendered animal and marine by-products do contribute to salmonellosis in animals and man. However, since the total contribution is difficult to determine because of the other environmental sources of salmonella, the cost benefit ratio would not warrant the large expenditure of resources necessary to adequately police the entire rendering industry. Therefore, in 1976, FDA abandoned the idea of initiating any formal compliance program directed toward rendered products contaminated with salmonella. No routine inspection or analysis of domestic or imported rendered by-products was contemplated during the late 1970's and 1980's.

Today there exists an agreement with the National Oceanic and Atmospheric Administration and the Animal and Plant Health Inspection Service, USDA, concerning the inspection of industrial fishery products intended for animal feed. Through this agreement, FDA provides information and other support, short of routine inspectional operations, to the Department of Commerce.

FDA recognizes the complexity of the salmonella problem. Its widespread presence precludes complete elimination so that reduction and control have become the viable alternatives. Federal and State agencies are working together to solve

the enigma of *S. enteritidis* infection in Grade A shell eggs. Attention is paid to the housing and raising of poultry, the processing and handling of poultry products and the preparation of food for human consumption. CMV is involved in the link of bacterially-contaminated animal feeds and disease in both man and animals in reducing and controlling salmonella in animal feed and products intended for animal feeds.

Dr. George A. Mitchell, Associate Director for Surveillance and Compliance, CVM, addressed a salmonella education/reduction conference of the Animal Protein Producers Industry on January 17, 1989. A portion of his presentation on salmonella follows;

It is generally accepted that animal protein products are contaminated with salmonella organisms prior to or during slaughter. It can also be shown that much of the bacterial contamination is destroyed or inhibited during the subsequent processing. The problem seems to be recontamination due to unsanitary handling of the finished product. Recontamination rates of between 0 and 100% have been reported in the rendering industry. Basically, control of salmonella in the rendering industry is based upon an effort to reduce and eliminate contamination of the clean product after the heat treatment. Sound management and product handling practices are necessary in order to prevent recontamination of the finished product.

The critical control or intervention points are numerous in the rendering process. First the processing equipment must be maintained in proper working order to achieve the time and temperature conditions necessary to ensure bacterial kill. The premises should be maintained in a hygienic manner to prevent the finished product from coming into contact with raw materials or from coming into contact with rodent or bird pests. Employees should never walk from raw material to finished product areas of the plant without first washing hands and footwear. Contaminated clothing, tools and equipment should not be permitted in the finished product area. Employee education is necessary to instill an understanding of the problem and a motivation to improve sanitary practices. Education programs should be continuous.

These following statements are scientifically evi-

dent: salmonella is found in the digestive tract of man and animals, it can multiply in protein products, and it may be found on raw food including food of animal origin. Heat (180°F for 20 minutes) kills salmonella, and low moisture can inhibit the multiplication of salmonella. Based on this knowledge, it can be generally predicted that facilities that do not properly cook raw ingredients, that do not control the

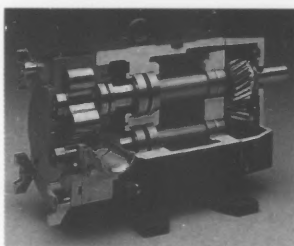
moisture, people, traffic, tools and equipment, and that allow finished products to come into contact with infected raw ingredients will produce a product with higher salmonella counts. It is time to embrace the basic concepts of good hygienic management and to set high goals for ourselves in the control of salmonella.

Reprinted from *FDA Veterinarian*, March/April 1989.

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Michael P. Doyle

New IAMFES Secretary

Michael P. Doyle through vote of the IAMFES membership will begin his term on the IAMFES Executive Board in August, 1989.

Michael Doyle is a Professor of Food Microbiology at the University of Wisconsin-Madison, Food Research Institute. He is an active researcher in the area of foodborne bacterial pathogens and works closely with the food industry on issues related to the microbiological safety of foods. Prior to his academic appointment, he was a Senior Project Leader in Corporate Microbiology at Ralston Purina Company in St. Louis.

Mike is a graduate of the University of Wisconsin-Madison where he received his B.S. degree in Bacteriology, and M.S. and Ph.D. degrees in Food Microbiology.

He has been quite active in the International Association of Milk, Food and Environmental Sanitarians. He served from 1981-1986 as Associate Editor of the *Journal of Food Protection* as a member of the IAMFES Publications Committee. From 1984-87 he was a member of the Advisory Committee on Annual Meeting Program Content. He has been an invited symposium speaker at six national IAMFES meetings. He has also served on committees of the Wisconsin Association of Milk and Food Sanitarians as vice-chairman of the Committee on Education and as a member of the Program Committee. He has been a member of IAMFES since 1974.

Biggest Health Threat: Bacteria Still Main Culprit in Food Safety Problems

With all the present-day furor about pesticides and other manmade contaminants of the nation's food supply,

little attention is often given to the biggest health threat of all--bacteria.

"It's amazing how such a major problem as bacterial food poisoning can be swept under the rug by those advocating a safe food supply," said Dr. Al Wagner, a food technologist with the Texas Agricultural Extension Service.

From 21 to 81 million cases of food borne illnesses occur each year in the U.S., Wagner said, costing \$5 to \$17 billion in medical care and lost productivity.

While a wide range of materials can cause food poisoning, including chemicals, heavy metals, parasites, fungi and viruses, bacteria are the main culprit, accounting for more than 90 percent of all incidents.

Bacteria Common in Food

Bacteria are common on raw foods, but proper care and handling will eliminate most problems," Wagner said. "Personal hygiene, clean food preparation areas and utensils, and proper washing and cooking of food products are the main ways to keep food poisoning to a minimum."

"Bacteria are usually present, but they don't do much harm unless their numbers grow. That's what happens in an unclean environment and with mishandling of food," Wagner said.

"For instance, bacteria multiply rapidly at temperatures between 40 degrees F and 140 degrees F, so both raw and cooked foods should not be kept in this danger zone any longer than absolutely necessary," said the food technologist.

In many cases, problems can be prevented by simply washing raw fruits and vegetables before eating, Wagner said. Proper washing can reduce pesticide residue on food products.

"I certainly wouldn't eat an apple that's been handled by a lot of people in the grocery case without washing it first," Wagner said. "That's just common sense."

He said that infants, older persons, pregnant women and anyone with a weak immune system are especially susceptible to food-borne illness. These people should never eat raw fish, raw seafood or raw meat-type products.

Most Common Culprits Listed

Wagner listed the most common food-poisoning bacteria, in what types of food they are found, symptoms and causes:

--Staphylococcus: meat and seafood salads and sandwich spreads; nausea, vomiting and diarrhea; poor personal hygiene and temperature abuse.

--Salmonella: meat, poultry, fish and eggs; diarrhea, nausea, chills, vomiting and fever; contamination of ready-to-eat foods, insufficient cooking and recontamination of cooked foods.

--Clostridium perfringens: meat and poultry dishes, sauces and gravies; cramps and diarrhea; improper tem-

perature control of hot foods and recontamination.

--Clostridium botulinum: home-canned foods; blurred vision, respiratory distress and possible death; improper methods of home-processing foods.

--Vibrio parahaemolyticus: raw and cooked seafood; diarrhea, cramps, vomiting, headache and fever; recontamination of cooked foods or eating raw seafood.

--Bacillus cereus: starchy food; mild diarrhea and some nausea; improper holding storage temperatures after cooking.

--Listeria monocytogenes: milk, soft cheeses, vegetables fertilized with manure; mimics meningitis; contaminated raw products.

--Campylobacter jejuni: meat, poultry, milk and mushrooms; diarrhea, cramps and nausea; improper pasteurization or cooking and cross-contamination.

--Yersinia enterocolitica: milk, tofu and pork; diarrhea, abdominal pain and vomiting (mimics appendicitis); improper cooking and cross-contamination.

--Enteropathogenic E. coli: meat and cheese; diarrhea and abdominal pain; inadequate cooking and recontamination of cooked products.

AFFI Urges EPA to Allow Group Permits in Stormwater Discharge Plan

In comments filed recently with the Environmental Protection Agency (EPA), the American Frozen Food Institute (AFFI), complimented EPA's efforts to minimize the burden created by the 1987 Clean Water Act Amendments requiring all industrial dischargers of stormwater to obtain permits. AFFI suggested, however, that EPA implement a "group permit" system which would result in substantial savings in time and cost.

According to AFFI's comments, many industries, such as the frozen food industry, use processes and materials which do not contribute greatly to water pollution or other aspects of the environment through its process waste water. This makes the group permit approach ideal if it can be designed to minimize unnecessary regulatory burdens.

"The task of regulating stormwater discharges from all industrial activities will be awesome, and the regulatory resources for creating a positive impact on water quality will be spread too thin unless EPA devises a group permit program that can achieve substantial regulatory economies," stated Steven C. Anderson, AFFI executive vice president, in the comments.

Anderson stressed that the proposed rule fails to provide adequate incentives to members of the industry to participate in a group permit program due to a lack of clear savings in costs and regulatory burdens, said Anderson.

"Under the proposed rule, the cost and effort required in pursuing a group permit application may exceed, on a per-facility basis, that of seeking a permit directly from the issuing authority by means of an individual application," he added.

"Other concerns involved extension of application deadlines; new facilities in a group permit application; selecting a "representative storm event" for sampling; and tests to certify that a facility's stormwater discharge contains no process waste water.

For more information, contact Traci D. Vasilik (703) 821-0770.

International Conference — Fermented Milk Products: The Current State of Research

SYNDIFRAIS (French Union of Manufacturers of Fresh Milk Products) and the INTERNATIONAL yoghurt Manufacturers Association are organizing an International Conference to consider the latest scientific knowledge relating to yoghurt and other fermented milks.

These products are playing an ever-increasing part in food consumption, all over the world.

At the invitation of the Scientific Commission for Nutritional Research on Fresh Milk Products, the top international specialists in the field will be gathering in Paris, from 14 to 16 December 1989, at the Palais des Congres.

For more information contact: Syndifrais, 37, rue du General Foy, 75008 Paris, France.

National Restaurant Association Urges Promotional Activities Aimed at Social and Environmental Problems

In a special issue of its bi-monthly publication, *Pro-Motion*, the National Restaurant Association has called on its members to launch promotional activities aimed at resolving visible environmental and social problems.

"Concern about America's social and environmental problems is currently at an all-time high," said association President Jim L. Peterson. "The new administration in Washington is asking private citizens and businesses to provide the assistance needed to protect the environment and help less fortunate groups of Americans. Now more than ever, restaurateurs should position themselves as socially responsible members of the community."

The editors of *Pro-Motion* suggest that reducing solid waste and feeding the homeless are two major areas in which foodservice programs can contribute to the common good and also win favorable publicity.

The editors of *Pro-Motion* recommend that restaurateurs use press releases, newsletters and in-store materials to inform the community that they are entering the battle for a cleaner environment. "It is a good business position to be part of the solution rather than the problem. By taking

voluntary steps to reduce waste and introduce recycling," *Pro-Motion* says, "your operation may avoid skyrocketing disposal costs and restrictive legislation."

Pro-Motion also advocates involvement in programs for feeding the poor. It describes "Second Harvest," a national organization with local chapters that accept donations for distribution to food banks.

It also describes the activities of "Share Our Strength" (SOS), a national organization of restaurateurs that runs a variety of fundraising programs and uses the proceeds to feed the poor.

Addressing foodservice operators who prefer to create their own programs, *Pro-Motion* advises locating the church or social service department that runs food banks and then arranging a regular donation of food, space, staff time or talent.

This special issue of *Pro-Motion* discusses a variety of other charitable activities such as promotions which raise funds for cancer research, AIDS research, the March of Dimes or the multiple sclerosis drive. It also talks about promotions aimed at producing service for the disabled or the elderly.

Pro-Motion is a four-page tabloid on restaurant promotional activities, which is issued bi-monthly by the National Restaurant Association. Subscriptions are available through the Communications department of the association (202) 331-5944.

American Interplex Corporation Laboratories

American Interplex Corporation laboratories has relocated to its newly completed \$1.8 million, 9,800 square foot laboratory facility at 8600 Kanis Road, Little Rock, Arkansas 72204. American Interplex has been providing quality analytical chemistry and microbiology to the food industry for over twenty years.

Arizona Heart Institute Endorses Miss Karen's Gourmet Frozen Yogurt

The Arizona Heart Institute today endorsed three varieties of Phoenix-based Miss Karen's Gourmet Frozen Yogurt as meeting "the dietary standards for a nutritious, heart-healthy diet."

Notifying Tom McClain, creator of Miss Karen's and president and chief executive officer of the Tom McClain Company, of the endorsement was Jayne Newmark, MS, RD, Director of Nutrition Services for the Arizona Heart Institute.

"The Institute is happy to endorse Miss Karen's Nonfat Frozen Yogurt Cups, No Fat Frozen Yogurt and Original Frozen Yogurt," Newmark said. "These products when consumed as part of a varied diet meet the Arizona Heart Institute guidelines and add variety and versatility to a lifetime of heart-healthy eating."

Newmark said that one ounce of Miss Karen's No Fat Frozen Yogurt contains 23 calories, no fat, no cholesterol and only 10 milligrams of sodium. One ounce of Miss Karen's Original Frozen Yogurt has 20 calories, .3 grams of fat, 2.3 milligrams of cholesterol and 8.5 milligrams of sodium. The four ounce Nonfat Frozen yogurt cups contain 108 calories, no fat, no cholesterol and only 40 milligrams of sodium.

"We are both delighted and gratified by the Arizona Heart Institute's endorsement," McClain said. "It has been our aim all along to cater to the public's growing love for frozen soft serve yogurt's ice cream-like taste with a healthier product. This endorsement is recognition that we have achieved our goal."

Nutrition Director Newmark says the dietary standards of the Arizona Heart Institute include:

Reduce overall consumption to less than 25 percent of the total calories;

Reduce cholesterol intake to 100-250 mg. daily;

Limit the intake of sodium to a maximum of 3-4 grams per day by limiting table salt and heavily salted foods;

Eat a variety of foods from the basic four food groups in an effort to obtain all of the essential vitamins and minerals necessary for optimal health.

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Miss Karen's Gourmet Frozen Yogurt is the number one yogurt sold in retail stores in Arizona. The product is available in thirty-five states and is presently 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.

The Tom McClain Company is located at 13012 North Cave Creek Road, Phoenix, AZ 85022, (602) 867-0223.

UDIA Offers Dairy Line Art Booklet

A collection of line art featuring dairy foods and dairy scenes is now available in booklet form for \$75 to the public from United Dairy Industry Association.

Artwork includes renderings of dairy foods, recipes which use dairy ingredients, dairy farm and milk processing scenes, consumers purchasing dairy foods and nutrition information.

The 38-page, binder-ready artwork booklet is printed on glossy sheets for easy paste-up and reproduction.

For more information, contact S. Lata, United Dairy Industry Association, 6300 N. River Rd., Rosemont, IL 60018 (312) 696-1860, Ext. 227.

United Dairy Industry Association is a member-driven federation which coordinates a total promotion program for U.S.-produced milk and other real dairy foods.

Impacts of Highway Deicing Programs on Groundwater and Surface Water Quality

The use and storage of chemical agents and pavement abrasive materials to melt snow and ice from roadways have resulted in localized impacts to the soil, surface water, and groundwater regimes in western Maryland. GeoTrans assessed the impacts of deicing practices on surface water and groundwater in two studies conducted for the Maryland State Highway Administration. The results of the groundwater study, which focused on three sites in Garrett Country, Maryland, indicate that previous open-air storage of deicing salts at a maintenance facility and the application of deicing salts to roadways are responsible for the increased levels of sodium and chloride observed in the groundwater and soils at these sites. In localized sections of each study area, the levels of chemicals in groundwater exceed Maryland drinking water standards for chloride and recommended standards for sodium.

The results of the data review, field investigations, computer modeling, and analyses for the groundwater

Con't. on p. 384

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contamination study were used to develop a conceptual model of the hydrogeologic system in each of the study areas. These conceptualizations describe the source and transport of deicing salt constituents in the groundwater systems. The key points of the conceptual models are summarized below.

*The application of deicing salts and previous open-air salt storage practices are responsible for the increased levels of sodium and chloride observed in the groundwater at these sites. In localized areas, the levels of concentration exceed Maryland drinking water standards for chloride and recommended standards for sodium.

*Groundwater in the three study areas is transmitted primarily through fractures and bedding plane partings, with secondary porous media flow occurring in the coarser sandstone layers.

*Travel time estimates were calculated in the three study areas for groundwater flowing from various contaminant source areas to associated discharge points. These estimates vary depending on the length of the flow path and the hydraulic gradient but all give a residence time of less than ten years for groundwater discharging to local streams and rivers. The residence time of contaminants in the subsurface is partially estimated based on travel time calculations. However, the estimate must also account for movement through the soil zone and adsorption, cation exchange processes and matrix diffusion. These processes will increase the total residence time of contaminants in the system.

*In general, the occurrence of groundwater contamination in the study area is a function of the following factors: (a) aquifer hydraulic properties, (b) proximity to the source of contamination, (c) construction characteristics of wells and physical characteristics of springs, (d) local surface topography and roadway drainage, and (e) type of flow regime.

A second study on Chesapeake Bay tributaries was conducted to assess the effects of deicing practices on surface waters drained by the Chesapeake Bay. The data suggest that the relatively larger loads of salt entering the streams during the deicing season have little or no impact on the water quality with respect to existing water quality standards.

It appears that relatively large loads of salt are received during the winter season by streams in areas of high road density. The resulting concentration of sodium and chloride in the stream is a function of the volume of streamflow and runoff available to dilute these constituents as they move into and along the stream. Generally, numerous thaw events occur during the winter season which prevent large amounts of salt from accumulating in snow drifts and frozen soils. Therefore, salt compounds are discharged to streams as numerous dilute pulses of salt-laden water, rather than a few highly concentrated pulses of water. Streams which are most severely affected are those which receive salt-concentrated waters with a small watershed.

Reprinted from *GeoTrans, Inc. Newsletter*, April 1989.

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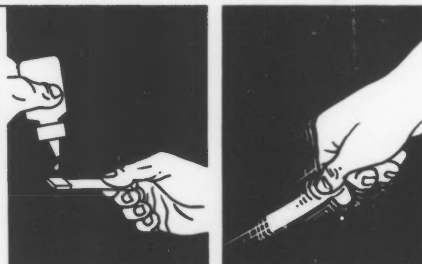
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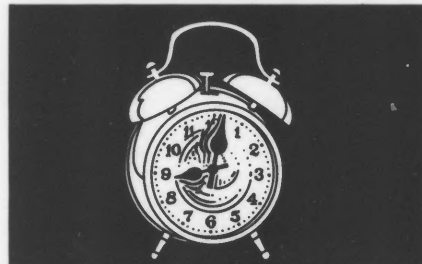
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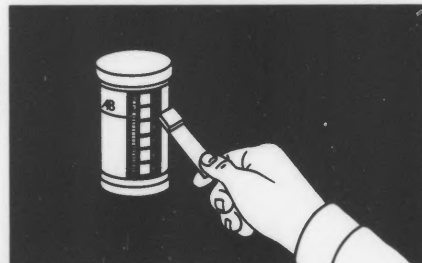
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Food and Environmental Hazards To Health

Leptospirosis: A Diagnosis to be Kept In Mind

A 67-year-old Quebec male with no pertinent medical history presented in the Emergency Department of a Montreal hospital with sudden pain and weakness in the lower limbs of 2 days' duration. He felt tired and feverish and had a severe headache. He denied any history of contact with toxic substances or infectious diseases. He had no respiratory or urinary symptoms. He lived in a rural area of the province and owned a dog.

On examination he was found to be moderately toxic, with a temperature of 39°C, blood pressure 110/80, and heart rate 96/min; lungs and abdomen were normal. There was no meningismus. Conjunctival icterus was noted. Lower limbs were painful on palpation and muscle strength was decreased. Sensitivity and reflexes, however, were normal. Initial laboratory results were as follows: hemoglobin 13.8g%, white cells 15,000 (93% neutrophils), platelets 63,000, blood urea nitrogen 30mg%, creatinine 2.2mg%, creatine phosphokinase 2379U/L, transaminase (SGOT) 179U/L, alkaline phosphatase 93U/L, and bilirubin 5mg%. The patient was admitted to the hospital with a presumed diagnosis of viral myositis with hepatitis.

The myalgia decreased in subsequent days, but he continued to have chills and fever. Two days after admission he became oliguric, anemic and thrombocytopenic. Blood cultures were negative.

The patient was admitted to intensive care and hemodynamic monitoring indicated pulmonary artery pressures of 26/13 mmHg. There was microscopic hematuria as well as oozing at puncture sites. Urinary sedimentation yielded numerous non-specific casts. Platelet count dropped to 16,000 and hemoglobin to 7.5g%, requiring the administration of 3 units of packed red blood cells. Blood smears showed no fragmentation, the Coombs' test was negative and haptoglobin was under 1mg%. Partial thromboplastin and prothrombin times remained normal. Bone marrow aspiration was also normal.

The patient required hemodialysis 3 times. On the sixth day after the onset of symptoms he became afebrile and his general condition improved. Paradoxically, as the slight cytopenia improved, the bilirubin rose to a maximum of 37mg% on the tenth day. Hepatitis B antigen and antibodies were negative and abdominal echography showed no obstruction of the bile ducts. The clinical, hematological and renal improvement was soon followed by a decrease in the bilirubin.

A diagnosis of leptospirosis was initially suggested on day 6 of his illness. Dark-field investigation for leptospires in the urine was negative at that time. Serological titres of less than 1/50 on day 6 rose to 1/6400 for *Leptospira icterohaemorrhagiae* and 1/800 for *L. canicola* on day 66.

Discussion: Leptospirosis is an infectious bacterial disease caused by a spirochete of the genus *Leptospira* and is one of the most widespread zoonoses in nature. The main reservoir of infection is rodents, although dogs, cattle, cats and pigs may also be affected. Leptospires may survive for long periods in the renal tubules of certain hosts and thus be excreted in their urine for prolonged periods of time. Man acquires leptospirosis either through direct contact, e.g., rat bite, or indirect contact such as penetration of the leptospires through skin abrasions or numerous membranes. Leptospirosis in its severe form (Weil's syndrome) is characterized by the following triad of disorders: renal failure, icterus and predisposition to hemorrhage. Death results in 5 to 10% of cases with the severe form; in the other cases there is complete recovery without sequelae. Fortunately, the severe form of leptospirosis is rare and is observed in only 5 to 10% of cases. Most often the infection is asymptomatic or manifests itself in non-specific symptoms that are hard to distinguish from common viral illnesses. In fact, up to 15% of abattoir workers, veterinarians and farmers have serological evidence of past infection. Often this anicteric form of leptospirosis has a 2-phase evolution with the first phase ("septicemic"), which lasts 3 to 7 days, characterized by abrupt onset of fever, headache, vomiting, myalgia, abdominal pain, and conjunctival reddening. It may be followed by a second ("immune") phase which is characterized by rash, aseptic meningitis and/or uveitis.

During the first 7 days of the infection, the leptospires are found in the blood and CSF; they are excreted in the urine for much longer (up to one month post-infection). Leptospirosis may be diagnosed in 2 ways: detection of the organism by direct visualization or by culture and serological testing. However, the most frequently used diagnostic method is serology; there are 180 different serotypes of *Leptospira*. Contrary to what was formerly believed, a given serotype is not associated with a specific clinical manifestation. Moreover, there are cross-reactions between the various leptospires. The sera of the patient described here, for example, showed antibodies for both *L. icterohaemorrhagiae* and *L. canicola*. Since 1985, serology for leptospirosis has been done by the Laboratory Centre for Disease Control in Ottawa. The following serogroups involved in human pathology are tested: *autumnalis*, *ballum*, *canicola*, *grippotyphosa*, *icterohaemorrhagiae*, *pomona*, *sejroe* and *tarassovi*. A presumptive diagnosis of leptospirosis is made for titres in excess of 1/50 for a serotype in one or more sera. Definite diagnosis is made when there is a 4-fold increase in the titre of antibodies for a given serotype on 2 sera taken 2 to 4 weeks apart.

In Canada from 1966 to 1978, and from 1980 to 1983, 1 to 7 cases of leptospirosis were reported annually, mainly during the summer. However, these figures do not reflect the

true incidence of the disease, since only hospitalized cases are reported.

The most important aspect of treatment of the severe form of leptospirosis is support of vital functions: re-establishment of blood volume, hemodialysis if there is kidney failure, and correction of thrombocytopenia. Antibiotic therapy appears to be effective only at the onset of the disease. Penicillin or tetracycline should therefore be administered in the first 4 days of symptomology.

When should a clinician suspect leptospirosis? Clearly, the anicteric form often goes unnoticed. Leptospirosis should be considered in any case of aseptic meningitis with unknown etiology. Studies by the U.S. Centers for Disease Control have found serological evidence of leptospirosis in 10% of previously unexplained meningitis or encephalitis. Serology should be carried out in situations where the possibility of leptospirosis exists. Leptospirosis should be in the differential diagnosis when a jaundiced patient is seen with an acute onset of icterus and renal dysfunction.

This patient presented with a classic case of the severe form of leptospirosis.

Can. Dis. Weekly Rept. 1/21/89



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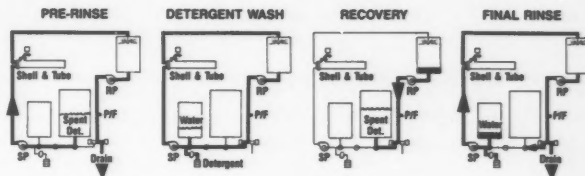
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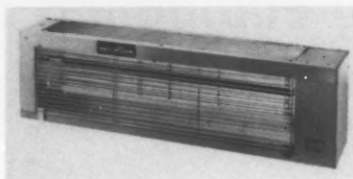
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Industry Products



Insect-O-Cutor[®] Introduces a New Line of "Low Headroom" Insect Electrocutors For The Industrial, Commercial and Institutional Markets.

With an overall height of only 12", the three versatile horizontal models in this series are ideal for use in any area with low ceilings and where vertical wall space is at a premium. Their all new "open top" design provides a maximum 240° of insect attraction. The three models in this horizontal style series range in size and wattage to meet the needs of the area to be protected. Complete with safety guards and removable reflector backplates, these **Insect-O-Cutor[®]R (I-O-C[™])** units can be overhead suspended or affixed to wall. With 28 different models, **Insect-O-Cutor[®]** now offers the most extensive line of insect electrocutors on the market.

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Roach Rinse Kills Roaches As You Mop the Floor!!

Roaches and crawling insects are problems to all food service areas of hospitals, schools, nursing homes, restaurants, hotels and institutions.

Chemplete Industries, Inc., a leader in the field of Maintenance Chemical Products to the Food Service Industry, has just introduced Roach Rinse.

Roach Rinse is an EPA registered, USDA accepted, odor-less, powdered insecticide that is added directly into your mop water.

As you mop the floor, Roach Rinse is safely applied, and leaves an invisible residue, that insects cannot detect.

Roach Rinse kills roaches, ants, waterbugs, silver fish, palmetto bugs, and fly larvae.

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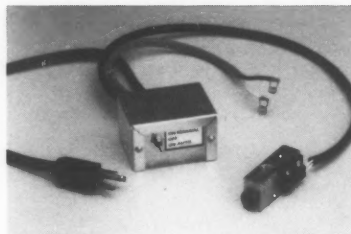
Cleaner Kills Germs That Cause Disease

Neutron Industries, Inc. introduces **Germicidal Giant**, a new cleaner/disinfectant designed especially for cleaning and maintenance professionals.

Germicidal Giant offers three way protection as a cleaner, deodorizer, and powerful disinfectant against dirt and disease. Laboratory tests confirm **Germicidal Giant** kills Herpes Simplex Type 2 on hard, nonporous surfaces. Its intensive strength also provides protection against staph and other microorganisms and controls mold and mildew.

Germicidal Giant has proven itself effective on washroom counters, toilet seats, work areas, and on formica, vinyl, porcelain, plastic, and leather. It eliminates and controls odors as it cleans leaving a fresh, mint fragrance. **Germicidal Giant** is EPA registered.

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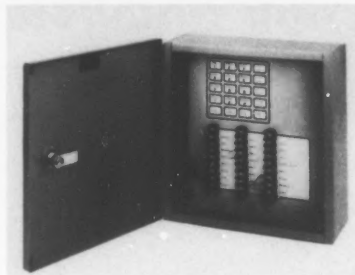
Flow Sensor With Solid-State Electric Control

Able Systems, Inc., Minneapolis, MN announces a new **Flow Switch No. 33621** to improve performance of pressure washers and other pumping devices.

Starts and stops pump without a pressure switch or other expensive controls. Prevents overheating of unit caused by shortline bypassing with unloaders. Unit runs only when gun is open.

Manual override possible...100% solid state...no relays. Compact and easily installed on existing equipment up to 3000 psi.

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Affordable Monitoring System Allows Remote Process Management Over Telephone Lines

The new **Sensaphone 4300 Monitoring/Control System** from **Phonetics, Inc.** allows remote management of important facilities and processes in a fully programmable, computer-based system.

Ideal for use in multiple locations, this "electronic watchman" provides versatile monitoring and control of any area or process. The **Sensaphone** may be interfaced through an integral 300 Baud computer modem to create a large area control network. This allows users to verify safe operation of multiple processes and conditions from a single central location, reducing the need for manual inspections.

Built-in sensors monitor power supply and temperature, and a built-in microphone lets users "listen-in" to detect unusual sounds. Two 4-20 mA inputs and six dry-contact digital inputs are used to monitor humidity, equipment, tank levels, water incursion, intrusion, and other user-selected conditions.

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Weber Scientific's 1989 Dairy Analysis Catalog

Weber Scientific announces the publication of their 1989 Dairy Analysis Catalog. The catalog contains 42 pages with over 400 items listed by test for easy reference.

Featured in the catalog are apparatus and reagents for testing butterfat content (Gerber and Babcock methods), acidity, bacteria count, antibiotic residue, salmonella, phosphatase and mastitis. The catalog also contains listings for sampling supplies, volumetric and gravimetric measuring equipment, glassware, plasticware, culture media and standardized reagents.

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Wheaton Announces Their New 1989/90 Laboratory Products Catalog

Announcing the release of the new Wheaton 1989/1990 Laboratory Products Catalog, with over three hundred pages full of our extensive scientific product line. Look for such Wheaton products as pH Meters, Water Purification Systems, Plastic Containers, Water Baths, Filtration Apparatus, Vials, Bottles, Jars, Flasks and many more interesting and exciting products.

The catalog features vivid color photographs and precise line drawings. Each product is presented with catalog number, description, and pricing. A complete index makes ordering easy. Turning the pages of the catalog exposes the many advances in laboratory equipment and supplies the high quality standards you associate with Wheaton.

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New Sling Psychrometer - Precision Relative Humidity Measurement

Brooklyn Thermometer's line of humidity sensing instruments is spearheaded by our new sling psychrometer. A reliable and convenient instrument preferred by the U.S. Weather Bureau, the sling psychrometer uses the wet-bulk dry-bulk technique and U.S. Weather Bureau Tables to determine relative humidity. The sling uses thermometers calibrated in 1/2°F divisions to provide readings accurate to 1% R.H. at various atmospheric pressures!

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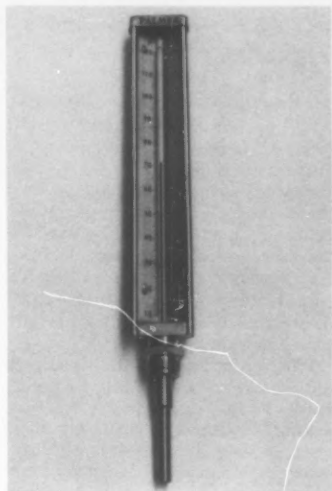


LacTek™ Sulfamethazine Milk Screening Test

Testing for Sulfamethazine no longer requires expensive laboratory equipment or time consuming procedures. Introducing the LacTek™ Sulfamethazine Milk Screening Test; a fast, cost effective assay developed by Idetek, Inc.

Five easy steps give you results which can be read visually or with a reader/printer. Specialized LacTek™ assays for other potential milk contaminants will be available soon from Idetek, Inc.

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Thermometers Offer Mercury Contamination Prevention

Palmer Instruments offers two mercury thermometer designs which isolate the mercury from product and environmental contamination.

Palmer's new One-Piece Construction Method offers an all welded construction of the stem, bulb and swivel nut fitting. This construction effectively seals the thermometer tube inside the one-piece unit on the process side. All parts are machined and welded in one piece versus three pieces screwed together. Thermowells may still be used. The One-Piece Construction Method was developed for the Food and Pharmaceutical Industry.

The second proven thermometer design, the Cleanliner, which completely isolates mercury from the product and environment uses a one piece 304 stainless steel stem or an all welded one piece construction, and a durable hermetically sealed plastic case. The Cleanliner was developed especially for the Dairy Industry to protect on the process side and environmental side of the thermometer.

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New Fisher Catalog Features Disposables

An eight-page color bulletin from Fisher Scientific offers a comprehensive selection of pipets, scintillation vials and culture tubes designed for one-time use.

Made to exacting Fisher specifications, and carrying the 87-year-old instrument-maker's Fisherbrand label, the products are designed to meet today's laboratories' increasing need for test-grade glassware and plasticware that is economically disposable.

Some 85 catalog items are listed, in packaging formats to suit small, medium and large-volume laboratories (they range from individual wraps, tray packs and resealable canisters to bulk packs of 500 and 1,000).

Fisherbrand products are available in polyethylene, clear polystyrene and borosilicate glass, in choice of sterile and nonsterile versions.

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Spectrochrom, Ltd.

The New Milk Quick Column Test from Spectrochrom, Ltd. tests milk and milk products for aflatoxin and sulfamethazine in a single procedure. This new method reduces the time of testing to a combined time of 5 minutes and a cost for aflatoxin and sulfamethazine to about \$4.00 each per sample.

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Model 217 Portable Airborne Particle Counter

Met One introduces the Model 217 Portable Airborne Particle Counter, a completely self-contained monitor with sensitivity to 0.3 micron. Easily carried in one hand, weighing only 7 pounds, and requiring no cords or plugs, the Model 217's small size and battery pack provide maximum portability and operator flexibility. The Model 217 is ideal for use as a stand-alone instrument or as an integral part of an overall system.

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New Tamperproof Transit Thermometer Accurately Charts Time vs. Temperature for Refrigerated Foods.

The new Model F Teletemp self-contained, certified accuracy transit thermometer is a low cost, tamperproof time vs. temperature continuous chart recorder for permanent documentation of refrigerated transit and warehouse conditions of critical temperature sensitive fresh, processed and prepared foods.

Using state-of-the-art solid state technology, a battery-driven stepper motor precisely controls chart speed as a dry stylus scribes temperature that is sensed by a bimetal element. Accuracy of 2°F or 1°C over ranges of -20° to +100°F or -28°C to +38°C. Chart time spans of 5, 10, 20, 30, or 60 days with accurate hourly temperature increments.

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Barnstead's New 1989 Water Book

The Barnstead Water Book is brand new for 1989! Your complete source for Ultrapure Water Equipment, the Water Book features Barnstead's entire new line including the completely redesigned Nanopure with new Remote Dispenser, new Glass Stills and Sterilization equipment, as well as Barnstead's reliable Classic Stills and Reverse Osmosis units. This 80-page, 4-color catalog is fully illustrated with complete technical data and specifications plus current pricing information. For a free copy of the Water Book circle the reader service number below.

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Sanisafe & Associates, Inc. Launches Newsletter

Sanisafe & Associates, Inc. is pleased to announce the publication of its newsletter, the *Sanisafe Alert*. The monthly newsletter will contain timely and crucial news for members of the food industry. Paulette Gardner, a Certified Professional Food Sanitarian, stated, "The *Sanisafe Alert* will provide the industry with the latest developments concerning government regulatory compliance and food safety. Recalls are costly and undermine consumer confidence in our food supply."

**Please circle No. 256
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Oxyrase™ Now Available to Bactometer Users

Vitek Systems, Inc. has announced that users of the Bactometer Microbial Monitoring System now can purchase Oxyrase™ from Vitek for use with the Bactometer. Oxyrase™, manufactured by Oxyrase, Inc., is a specific, biocatalytic oxygen-reducing agent. When used with the Bactometer, Oxyrase™ enables earlier detection of anaerobic microorganisms by providing a local, anoxic environment. This promotes the growth of anaerobic microorganisms for faster detection without the need for inhibitory, non-specific reducing agents in the medium.

Test results indicate that using Oxyrase™ with the Bactometer Disposable Module is as effective for growing anaerobic microorganisms as putting the Bactometer incubator into an anaerobic chamber. By using Oxyrase™ with the Bactometer, both aerobic and anaerobic microorganisms can be grown in the same Bactometer incubator.

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Sani-Matic Systems offers Pallet Washer

Sani-Matic Systems is offering a continuous Pallet Washer specifically designed to wash pallets. Plastic pallets are available in several configurations so the guide and support structure is designed to accommodate the user's particular pallets.

The wash is compartmentalized with detergent and final rinse sections. An optimal pre-rinse compartment is offered for particularly heavy soil conditions.

The standard design includes a roller conveyor for push-through operation. If desired a continuous, power conveyor can be specified.

These washers feature stainless steel construction for long term durability and detergent recirculation for chemical savings. Other benefits of Sani-Matic Pallet Washers are: 1) consistent cleaning results; 2) labor and time savings; 3) water conservation, and 4) waste reduction.

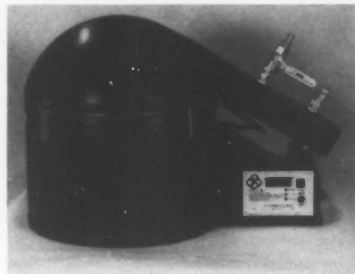
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Biological Contamination -- Kill Without Chemicals

Manufacturers and processors are often plagued with microbiological organisms in the water often obtained by an independent supplier. Until recently, additional and costly chemical treatment has been the only answer.

Now, small scale Aqua-Flo Ozone Systems are available to effectively treat the water for a variety of problems without using any chemicals. Aqua-Flo Ozone Generators convert oxygen from the air to heavy oxygen O₃ and inject it into the water supply. Oxidation of inorganic and organic contamination destruction is instantaneous. The short life O₃ and organic/inorganic matter is removed through a multi media bed, and water is sparkling clear, odor-free and microbiologically safe -- all without chemicals.

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Enviro-Saver Helps Reduce Hazardous Wastes!

Recently, Marellco Industries, Inc. in South Carolina introduced the Enviro-Saver, a 110-volt powered electronically controlled distiller that recclaims solvent from hazardous wastes.

The Enviro-Saver vaporizes solvents by boiling and then condensing the crystal clear vapor back to its liquid state, leaving behind the impurities. The reclaimed solvents can go back into their original operation immediately. This reduces the amount of solvents users have to purchase. By reclaiming the reusable solvent, hazardous waste collection can be reduced by up to 95% in volume.

With the sky-rocketing costs of hazardous waste disposal, many businesses are looking for ways to cut back on waste disposal. The Enviro-Saver can help them cut back. So, the user saves money by buying less solvent and by cutting disposal costs by up to 95%, not to mention long-term liability savings!

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Multivac CD6000

Multivac, Inc., in conjunction with Cryovac Division, W.R. Grace, has developed the ultimate method for wrinkle-free vacuum skin packaging. The Multivac CD6000 can be used in conjunction with flat or formed, rigid or flexible bottom webs.

The patented system involves two top web heating stations to "liquify" and "drape" Cryovac (R) top web materials over the product.

The first heating station heats the top web prior to product contact and before it enters the sealing die. The second heating station -- a dome inside the sealing die -- heats the material to full plasticity just prior to a vacuum from below pulling the material onto the product.

Since the film is heated a second time, any previous contact with the product does not cause cold or hot spots. And since the film is in a near-liquid state when it contacts the product, it will drape gently over the most fragile product without destroying it. In essence, the product is the die.

The final top-to-bottom web seal is made without a seal bar. The liquified top web material makes its own "total seal" -- from package edge to product edge. Since there is no need for heat in the lower sealing die in order to make a seal, there is no chance of burning the product through the lower web.

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Oil-In-Water Analyzer System Measures PPM Oil Contamination for Pollution Monitoring and Process Control

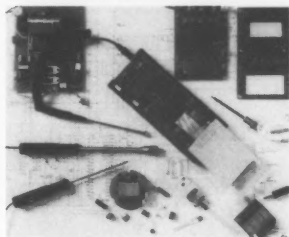
Teledyne's Model 660 Oil-in-Water Analyzer System provides on-line monitoring of parts-per-million (ppm) oil contamination in boiler return condensate, recycled cooling water, and waste water process effluent.

The Model 660 is ideal for these and many other water purity monitoring applications in chemical plants, petroleum refineries, deballasting facilities, waste water treatment plants, offshore platforms, and in a variety of other industries.

The Model 660 is a complete system that includes both an Analyzer and sample conditioning components on a single side of the free-standing rack (weather resistant cubicle mounting is also available). This configuration provides excellent access to all system components and makes routine servicing quick and easy.

The Model 660 sample system provides a zero fluid and properly conditioned, continuously flowing sample. This system allows true on-line monitoring of oil contamination with accuracy comparable to lab methods.

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Cooper Instrument Announces Custom Design Capability

Cooper Instrument, a 100 year old manufacturer of temperature instruments, has recently expanded its electrical engineering design staff and capabilities on their Electro-therm products.

For assistance with product development or software modifications, Cooper's engineers will work with you from start to finish on any design/manufacturing project you may have. The Company is proud of its ability to offer products made in the U.S.A.

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Source for Automation, Inc. Advances Water Quality Analysis

New capabilities for Water Quality Laboratories were demonstrated at the 1989 Pittsburgh Conference and Exposition. The SmartCell BOD Bottle Management and Recording System increases laboratory productivity from start to finish with

- *Sample Identification (Barcode Tracking Module)
- *Sample Transport and Processing (Robotic Arm)
- *Repetitive Analyses (Auto-log Module)
- *Report Generation (EPA or Customized Report Module)

Specific application workstations include

- *COD using the Hach Method and Instrumentation
- *BOD using Orion Research Instrumentation
- *pH using Orion Research Instrumentation
- *TSS using the Mettler AT Balance

SmartCell provides the tools for your laboratory to develop a more efficient, accurate flow of sample identification, preparation, analysis and reporting. To accommodate changing requirements, the SmartCell BOD Bottle Management and Recording System is available in modular units.

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Modular Measurement System

Solomat announces expansion of the capabilities for its portable MPM-2000 "Multi-Probe-Meter" to include measurements for Temperature, %RH, Airspeed, Air Pressure, Barometric Pressure, Water Pressure, RPM, pH, Conductivity, as well as other air and water quality parameters.

By changing plug-in modules the instrument can be adapted for different measurements, driven by the MPM-2000 central processor. All measurements are displayed on a 4 1/2 digit LCD along with appropriate unit symbols. Up to 5400 individual readings can be datalogged, for later downloading to a printer or computer. The meter also incorporates minimum, maximum and averaging functions, as well as an analog output for direct connection to a recorder or controller.

Accessories available for the MPM-2000 include over 100 probes and electrodes for varied applications, fixed mounting adapters, waterproof enclosures and IBM compatible software.

**Please circle No. 265
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Varex ELSD

Finally, a universal detector for HPLC (Well almost!). The Varex ELSD is an Evaporative Light Scattering Detector that is not responsive to the functional groups of compounds. This means that the mass balance of a multi-component mixture can be gotten directly from the area percent report of your integrator. Because the Varex ELSD evaporates the mobile phase, gradient elutions can be run without baseline shift. The detector is currently being used in applications like: lipids, phospholipids, triglycerides, steroids, polymers, carbohydrates, hydrocarbons, organic acids and many others. New applications being tried include peptides and amino acids. Since the response factors do not depend on functional groups, post-column derivatizations is not necessary. Only two limitations apply. The sample must be less volatile than the mobile phase and any buffers must be volatile. For example, phosphates won't work but ammonium acetate will work.

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New Safe-Grip[®] Absorbent From Stauffer Makes Food/Meat Plants Floor-Safe

Safe-Grip[®] is the new anti-slip and absorbent product specially developed by Stauffer Chemical Company for use in meat, seafood, and poultry plants, food processing and packaging plants, supermarkets, grocery warehouses, and restaurants.

This new product is a food grade chemical compound which absorbs oil spills and provides the traction necessary for employees to move about safely, even on wet and slippery shipping docks and ramps.

Safe-Grip[®] quickly absorbs oil and protein substances, such as blood, even in the presence of water, so fewer applications are required to keep the workplace safe, making it more effective to use than salt or pumice. This new product is also non-toxic and environmentally safe and, therefore, when it is time to clean up, Safe-Grip[®] can literally be washed down the drain or conveniently swept up. Since it is non-corrosive and non-abrasive, Safe-Grip[®] will not corrode or harm equipment in the plant.

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New Sanitary Fan Receives USDA Approval

A new series of food processing fans developed for USDA approved dairy facilities has been introduced by **Chicago Blower Corporation**. Called the Sanitary Fan, it is recommended for installations where zero contamination is mandatory.

In compliance with USDA requirements, the Sanitary Fan features polished stainless steel wheel and housing while non-critical exterior surfaces are coated with a non-toxic epoxy. Wing nuts allow quick and easy disassembly for cleaning. Other features include USDA approved virgin neoprene gaskets and shaft seal.

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Airborne Bacteria 99.99999% Inhibited in Niagara Refrigeration & Dehumidification Systems

New test results have recently confirmed claims by the **Niagara Blower Company** that airborne bacteria can be 99.99999% inhibited through use of their glycol-based No Frost Refrigeration and Hygrol Dehumidification systems.

The data from formal tests, conducted by a prestigious, independent University Microbiology Lab, clearly shows a 99.99999% inhibiting effect of the ethylene, propylene and trimethylene glycol used in these systems on the existence of *Listeria*, *Salmonella* and *Yersinia*.

The key to the bacteria inhibiting effectiveness of these systems is said to be the capture of 98% of airborne micro-organisms by a massive, drenching, glycol spray over the evaporator coils. Once captured in the system, virtually all bacteria are permanently inhibited.

Compared with conventional, airborne bacteria control methods, self-contained, glycol-based **Niagara** systems require no special filters, which can present difficult disposal problems.

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Disposable Dilution Bottles...Saves Dairy and Food Laboratories Time and Money

Weber Scientific announces the introduction of a sterile, prefilled and accurately buffered disposable plastic bottle for serial dilutions. Extensive time studies indicate this new product can save labor and energy costs compared to the tedious procedure currently used in most laboratories.

These unbreakable bottles are used right out of the box. They are guaranteed to be sterile. Use of this bottle will eliminate the need for buffering, filling, sterilizing and washing breakable glass dilution bottles.

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TurboVap Evaporator - Automatic High Speed, Selectable Endpoint Evaporators

For those seeking an automated, yet economical alternative to hot block, Kuderna-Danish, and rotary evaporators, **Zymark Corporation** (Hopkinton, MA) has developed the TurboVap, automatic high speed, selectable endpoint evaporators. Using patented technology, these evaporators will rapidly concentrate samples 10 x faster than conventional techniques, perform a solvent exchange, stop the evaporation at dryness or a set volume, and signal the operator when finished.

Product information is available which describes these units in greater detail. Circle the reader service number below for your free copy of this information today!

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Anderson Bulletin Describes Four-Channel Digital Monitors for Sanitary Process Control

Bulletin ASH19 describes the **Anderson Instrument Company's** new line of Quad-series sanitary digital monitors which simultaneously observe and display the values of up to four process variables. The variables are pressure, temperature and any combination of the two, and their values are displayed in 1/2 inch high LEDs in the user's choice of engineering units which include psig, psia, degrees F, degrees C and percent.

The bulletin spells out instrument specifications in detail, includes illustrations showing typical applications for the Quad Series, and furnishes mounting-dimension drawings.

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Neogen Introduces On-Site Sulfamethazine Test

Neogen Corporation is introducing a quick and easy on-site test for determining live animal sulfamethazine levels. The new test, released in mid-February, joins **Neogen's** family of Agri-Screen' diagnostic tests.

Agri-Screen gives meat animal producers, buyers and processors accurate and reliable determinations of sulfamethazine levels in blood in about 15 minutes. Anyone can conduct the test: on the farm, off the truck, at the yards or at the plant.

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News From Hydrotex

Food machinery greases in 13-oz. aerosol packaging have been introduced by **Hydrotex**. Classified H-1 by the U.S.D.A., these lubricants were previously available only in drums and grease gun cartridges.

Authorized for use in federally-inspected meat and poultry plants, the **Hydrotex** greases are blended with U.S. Pharmaceutical grade base oils for added purity.

Two options are offered: Number 112 and Number 113. Both are formulated to protect food processing equipment operating under extreme conditions, including moisture, heat and high speed. They have been shown to resist pounding, pressure and water wash-out, the company reports. Number 113 includes a special tackiness agent, TK-5, for food processors requiring this characteristic.

Both greases are packaged in cases of 12 aerosol cans.

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Permaflox Introduces 501 Flooring Material For Slip-Resistant, Easy-To-Clean Floors

Premaflex Products has introduced **Permaflox 501**, an anti-skid seamless flooring system made of high strength epoxy-polymer. It provides excellent traction even when wet or oily and can be applied over new or old concrete, plywood or metal decks.

This flooring is ideal for conditions found in food processing and dairy plants. It is highly resistant to oils, animal blood and fats, milk products and many chemicals including acids, alkalis, salts and solvents, and is USDA- and OSHA-approved.

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Publication Announced of All-New 6th Edition Manual of BBL Products and Laboratory Procedures

Becton Dickinson Microbiology Systems announces the publication of the 6th Edition of the **Manual of BBL Products and Laboratory Procedures**.

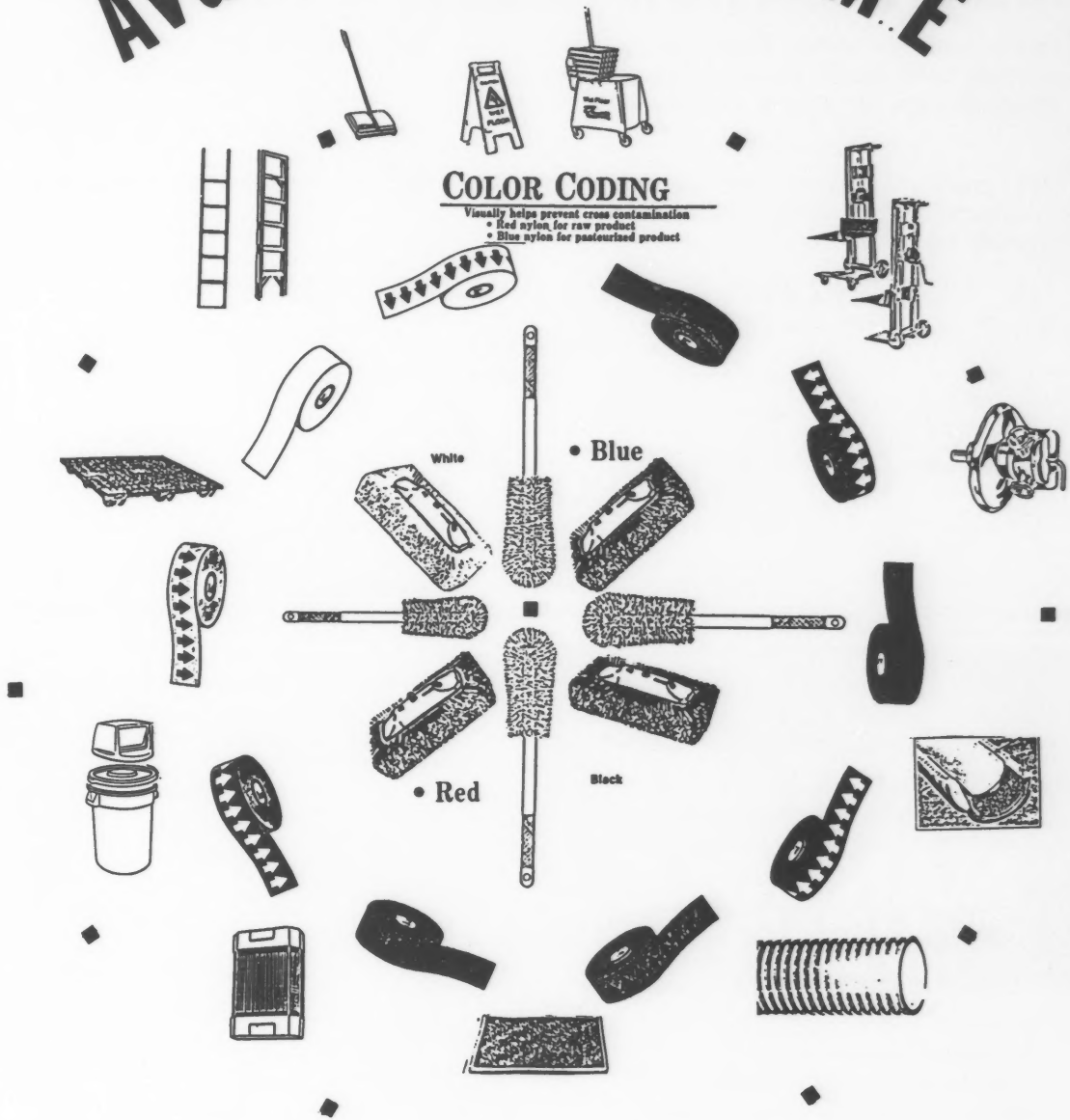
Significantly enlarged and improved, the 6th Edition features completely new, intricately detailed full-color illustrations of current laboratory procedures and standard microbiological techniques.

The new Manual also includes comprehensive, up-to-date technical references covering the entire microbiology field, with information on both traditional and new rapid diagnostic products. A complete roster of all **Becton Dickinson Microbiology Systems** products is also given.

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Food Service Code Interpretations

by

Homer Emery

IAMFES Food Service Interpretations Committee

This has been a busy summer for most of us. Starting last spring with the Alar and apples issue and the ever growing *Salmonella enteritidis*, problem a new era of concern for food safety and awareness of sanitation is at hand. As the American public consumes increasing amounts of ready to eat and fast to fix foods the food sanitarian will again be a key member of the public health team.

It will be a challenge to address emerging food sanitation issues in a manner that affords the maximum degree of public health protection while providing industry with workable and economic solutions. To meet this challenge food sanitarians will need to be leaders and communicators to inform both the public and industry of what needs to be done. Food sanitarians must become more involved in their professional organizations and fully participate in debates and discussions on these issues.

If this sounds like an advertisement for attending the IAMFES Annual Meeting this month in Kansas City, then you're right. An excellent way to become involved in and informed of current food safety issues is to attend committee meetings scheduled on Saturday and Sunday before the conference officially begins.

Complete details and times for committee meetings are provided in the April issue of *Dairy, Food and Environmental Sanitation*. A number of major food related committees will meet on Sunday, August 13, starting at 11 a.m. with the Food Service Sanitation Committee and ending with the FDA Interpretations Committee in the afternoon. You do not have to be a committee member to attend.

OFF THE CLIPBOARD: Last February the FDA prepared a paper on pesticide residues found in foods that children eat. The paper describes monitoring of foods by FDA for pesticides and how tolerances are established.

-Should cold foods be required to be stored at 45°F or 40°F? Seems like a simple question but when posed in the draft Unicode, it created somewhat of a heated debate. This will be one of the items on the agenda for the Interpretation Committee during the IAMFES Annual Meeting.

-See you at the IAMFES Annual Meeting. If you would like a copy of the FDA paper of pesticide residues send a SASE to: IAMFES FDA Interpretations Committee, P.O. Box 1832, Frederick, Maryland 21701.

Homer C. Emery, R.S.

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Affiliate News

Nebraska Association of Milk and Food Sanitarians Holds 2nd Annual Meeting

The 2nd Annual Meeting of the Nebraska Association of Milk and Food Sanitarians was held April 13-14 at the Holiday Inn Central in Omaha, Nebraska. Sixty-two people were in attendance, and twelve speakers presented an outstanding program. The Nebraska Affiliate was granted a charter at the National IAMFES Meeting in Tampa, Florida last August.

Dr. John Rupnow of the University of Nebraska, gave an update of E. coli 0157 and its pathogenic effects in foods. Mark Pratt of USDA-St. Louis, summarized the ongoing USDA testing programs for Listeria and Salmonella in cooked and uncooked meats.

Lois Clauson of Douglas County Health Dept., presented an interesting study of the microbiological quality of delicatessen items in the Omaha area. Greg Riley of Henningsen Foods, profiled the various rapid methods available for Salmonella and Listeria analysis in foods. Tom Tieso demonstrated the rapid detection methods used by the Nebraska Department of Agriculture for sulfamethazine and aflatoxin detection in fluid milk products. Also, a tour of A & L Laboratories, an independent testing facility, was conducted for interested participants.

In the business meeting held the second day, a new Secretary-Treasurer was elected. New officers for next year are President, Nancy Bremer; President-Elect, Dirk Shoemaker; Secretary-Treasurer, Jerry Hunt; and Past President, Dr. Richard Brazis. The possibility of rotating meeting sites between Lincoln and Omaha was also discussed. The meeting was concluded by awarding Door Prizes to lucky participants.

GAFES Marks 3rd Year as an Affiliate of IAMFES

The recent GAFES Annual Meeting marked the beginning of the affiliate's third year in existence. As professional organizations go, we are still in our early infancy. Consequently, we still have a long way to go to meet our goals. Still, the very existence of GAFES after three Annual Meetings is encouraging to those of us who originally organized GAFES. Why? It is encouraging because some people initially refused to become involved because they considered GAFES doomed from the start. They felt there just wasn't enough interest in sanitation and related issues to warrant a group of this kind in Georgia. I am happy to say that, YOU, the GAFES members, proved them wrong! YOU were the ones who traveled long distances to attend our meetings and make them so successful. It was YOU who have made GAFES the envy of some other

Upcoming IAMFES Affiliate Meetings

1989

SEPTEMBER

14-15, 13th Annual Wisconsin Laboratory Education Conference will be held at the Oshkosh Hilton and Convention Centre in Oshkosh, Wisconsin. For registration information, contact: Laura Rauschl, Program Chairman, c/o Schreiber Foods, Inc., PO Box 19010, Green Bay, WI 54307-9010 (414) 437-7601.

19-21, New York State Association of Milk and Food Sanitarians, to be held in Buffalo, New York, at the Sheraton-Buffalo Airport Hotel. For more information, contact: Paul Dersam, 27 Sullivan Rd, Alden, NY 14004, 716/937-3432.

20-21, Wisconsin Association of Milk and Food Sanitarians Annual Meeting, will be held at the Holiday Inn East, Madison, WI. Contact: Neil Vassau, PO Box 7883, Madison, WI 53707 608/267-3504.

25-27, Indiana Environmental Health Association Fall Conference to be held at the Howard Johnson, Lafayette, IN. For further information call Tammy Barrett, IN State Board of Health (317) 633-0173.

OCTOBER

18-19, Iowa Association of Milk, Food and Environmental Sanitarians, will hold its annual conference at the Holiday Inn, Waterloo, Iowa. For information, contact: Dale Cooper, Box 69, Manchester, IA 52057 (319) 927-3212.

19, Associated Illinois Milk, Food and Environmental Sanitarians, will hold its fall meeting at the Blue Moon Restaurant in Elgin, IL. For more information please contact Clem Honer, 312-693-3200.

1990

FEBRUARY

26-27, Kentucky Association of Milk, Food and Environmental Sanitarians' Annual Conference will be held at the Holiday Inn Convention Center, Louisville, Kentucky. For more information, contact: Debbie Pierce, Secretary, KAMFES, PO Box 1464, Frankfort, KY 40602 (502) 564-3340.

IAMFES affiliates who have been in existence for many years. GAFES would simply not exist were it not for YOUR support.

GAFES held its 3rd Annual Meeting on February 17, 1989 at the Holiday Inn, I-20 East, Decatur. One-hundred-four persons attended the meeting making it the largest turnout for an annual meeting. The theme for the meeting was 'Controlling Pathogens in the Food and Food Processing Environments.' Speakers for the meeting included: Dr. Mark Harrison, UGA; Dr. Frank Bryan, Food Safety, Consulting and Training, Tucker; Dr. Joe Frank, UGA; and Elizabeth Parker, National Institute of Environmental Services, Inc., Newnan.

For the 1989 year, the following officers were elected:

Dr. Robert Brackett - President
Dr. Joseph Frank - Vice-President
Steven P. Petrides - Secretary
James C. Camp - Treasurer

During the business meeting, members also voted favorably to support the efforts of the Georgia Environmental Health Association (GEHA) to re-establish a Sanitarian Registration Act; to expand next year's annual meeting; to establish a formal Board of Directors appointed by the president; and to sponsor a student to present a research paper at the future IAMFES Annual Education Conference.

The GAFES Fall Meeting has been slated for August 25, 1989. A 'Pest Control' topic will be featured. Further details regarding this meeting will be forthcoming. Be sure to mark this date on your calendar.

Illinois Chapter Holds Outstanding Spring Seminar

Hamburger University, the McDonald Corporation's International Training Center, was the setting for the 1989 Spring Seminar. The use of these outstanding facilities was donated by the corporation. More than 140 were in attendance.

Charles Bagans, McDonald's Senior Quality Assurance Supervisor for Dairy Products, a long time member of both IAMFES and AIMFES (Associated Illinois Milk, Food and Environmental Sanitarians), hosted morning tours. The campus, in addition to the training center, includes a 265 room hotel and the new corporate office building with testing, research and development labs on the fourth floor. Contemporary art work decorates the halls and outdoors, the grounds are beautifully landscaped and incorporate two small lakes.

As he conducted the tour, Chuck Bagans spoke of his 10 years with McDonald Corporation. As part of his job, Chuck has visited 35 countries!

The formal part of the meeting was opened at 1 p.m. by AIMFES President Bruce Berg. Two affiliate members were

presented with IAMFES Certificates of Merit for their services to the International and the Illinois Affiliate Chapter. They were Charles Price, PHS/FDA and Robert Crombie, Crombie Company.

AIMFES 1989 Spring Seminar

President Berg announced the date for the Fall Meeting, October 19, 1989 at the Blue Moon Restaurant in Elgin, Illinois. Also, he spoke of the coming International meeting in Kansas City, and announced that the Illinois Affiliate will host the International meeting in August 1990.

President-elect Terry Mitchell introduced the afternoon speakers. The theme of the meeting was "PREVENTION - The Key to Quality". Subjects and speakers were: *Prevention Implementation*, Gordon Hogan, Philip Crosby Associates; *Sanitation: Key to Prevention*, Paulette Gardner, Sani-Safe and Associates; *McDonald's Quality Assurance Program*, Robin Johnson, McDonald's Corp.; *Implementing HACCP*, Don Kimball, Dean Foods; *Regulatory Aspects of HACCP*, Shirley Bohm, Illinois Dept. of Public Health; and *NCIMS and FDA Initiatives*, Charles Price, FDA.

After a Social Hour, a dinner hosted by the Chicago Dairy Technology Society was held in the hotel dining room. Honored at the dinner was Kenneth E. Gignac, President of Elgin Honey Hill Corporation. He received the P.H. Tracy Award (Dr. Tracy was the founder of the CDT Society). Dena Miller, Food Science, University of Illinois, received the annual CDT undergraduate scholarship.

Mr. Art Cone, Regional Purchasing Manager, McDonald's Corporation, as the evening speaker, spoke on *McDonald's Procurement and Marketing of Dairy Products*. They use the "Real" symbol in their ads. McDonald's television commercials emphasizing dairy products were shown as part of his remarks. The McDonald Corporation is a major purchaser of our nation's dairy products.

All in all, it was an outstanding seminar, and the prime rib was delicious!

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RESEARCH REPORT GERMAN ROACHES IN MULTI-UNIT APARTMENTS

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Blue Diamond M.R.F. 2000 paste was applied according to label instructions in 7 apartments in Long Island, New York possessing high numbers of German roaches. Maintenance of the apartments had been neglected for some time, with a buildup of food, waste and trash. However, researchers first obtained a population estimate using three glue traps per apartment — one in each bathroom and two in each kitchen. Follow-up counts were taken with the traps one, two, four, and eight weeks after applying the paste.

Results: Within the period of the research, 96% elimination of German roaches! The M.R.F. paste worked gradually and effectively over the entire eight week period. By two weeks, the population was down by 73% and by four weeks, Blue Diamond M.R.F. 2000 had knocked out 95% of the roaches.

Dr. Frishman says, "There is no unfavorable odor associated with this product. No complaints were solicited from tenants during or after application. Two of the apartments tested contained asthmatic children and adults. No ill effects were reported by them from the presence of this material in their apartments."

Dr. Frishman's conclusion:

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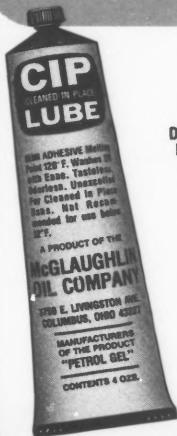


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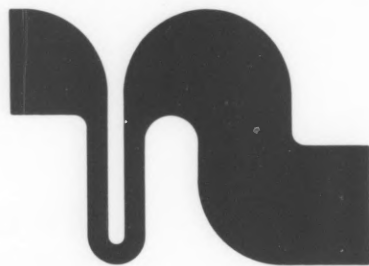
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Synopsis of Papers for the 76th Annual Meeting

Abstracts of papers to be presented at the 76th Annual Meeting of the International Association of Milk, Food and Environmental Sanitarians, Inc. to be held in Kansas City, MO., August 13-17, 1989.

Restriction Enzyme Analysis of Epidemic Strains of *Listeria monocytogenes*, Irene V. Wesley, USDA-ARS-National Animal Disease Center, Ames, IA 50010.

Listeria monocytogenes, serotype 4B has been associated with food-borne outbreaks in North America. Mexican-style soft cheese was the vehicle of transmission in the 1985 epidemic in Los Angeles County. The purpose of this study was to employ restriction enzyme analysis in characterizing 17 human and 20 cheese isolates associated with the Los Angeles outbreak. Genomic DNA was harvested and cleaved with Hha I which we have previously shown best differentiates strains of *Listeria*. Each of the 37 isolates exhibited the same restriction enzyme pattern, which indicates a common source of *Listeria* contamination. The DNA fingerprint could be easily differentiated from the patterns observed in other 4B strains which were not associated with that outbreak. Therefore, restriction enzyme analysis is a sensitive epidemiologic tool in characterizing strains of *L. monocytogenes* associated with common-source food outbreaks.

Food Industry Response To Product Safety, Panel Discussion, Robert E. Harrington, Assistant Director, Technical Services, Public Health & Safety, National Restaurant Association, 1200 Seventeenth Street, NW, Washington, D.C. 20036.

Recent controversy about chemical residues in foods underscores long-standing consumer concerns about food safety. The foodservice industry is very sensitive and responsive to such concerns, owing to intense competition. Many major multi-unit operations maintain in-house quality control functions, including purchase and operational specifications which often exceed minimum regulatory requirements. The National Restaurant Association has adopted a position urging foodservice operators to document training of personnel in food safety and sanitation.

Industries Experiences in Adaptation to Changes in Dairy Plants, Dave Welde, Mid-American Dairymen, Inc., 800 W. Tampa, Springfield, MO 65801-1837.

The dairy industry has changed greatly during the decade of the 80's and any dairy's success in the marketplace can be directly traced to the continual updating of processes and products

along with the modernization of our processing plants. Mid-Am has reacted to these changes in a number of ways: First, we realize that our employees are our most valuable resource: therefore, we need to continuously develop and present adequate training to ensure that these employees know how to do their jobs. Second, we have to have the supervisors' support in analyzing all of the jobs within their department and their help and support in presenting the training programs. Third, management faces the constant challenge of keeping up with changes in the marketplace and at the same time keeping up with changes in regulations and technology in order to produce products to meet or exceed all governmental regulations with a high level of consumer confidence. Fourth, industry and regulatory agencies should work together to protect the public health and that can be accomplished by advising the appropriate agency of proposed changes in plants and by submitting drawings for approval before construction is started. Finally, continuing education of middle and upper management is very important as we try to keep current with the world around us, not only for today, but for tomorrow and the day after.

Knowledge of Hazards Relating to Raw Oyster Consumption Among Selected Patient Risk Groups: Report of a Survey, C. R. Anderson, A. R. Johnson, G. E. Rodrick, University of Florida, Department of Food Science and Human Nutrition, Gainesville, FL.

Retrospective, epidemiological studies have identified groups at risk for contracting *Vibrio vulnificus* infection. Raw oyster ingestion and/or seawater exposure are primary methods for infection with *V. vulnificus*. In order to determine the baseline knowledge regarding *V. vulnificus* infectious disease risks, a survey of high risk groups was conducted. Fifty-six patients currently under treatment for cancers, gastrointestinal diseases, or liver diseases, were surveyed regarding their attitudes and behaviors on diet, recreation, and health status. Although all respondents were at risk for *V. vulnificus* infections, only 8 reported any previous counseling to avoid raw oyster consumption. 28 persons indicated they consumed raw oysters, and 21 reported ingesting raw oysters within the past six months. This limited survey indicates the need for strengthening patient education.

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Spouse Name _____

Children's Names _____

Please check where applicable:

IAMFES MEMBER _____ STUDENT _____

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| REGISTRATION FEES | | Student Spouse | Amount Enclosed |
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| Pre-registration | Member \$60 | \$15 | \$ _____ |
| On-site registration | Member \$90 | \$20 | \$ _____ |

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| OTHER FEES (Per Person) | | # of tickets needed |
|-------------------------------|--|---------------------|
| SUN., AUG. 13 8-10 p.m. | Cheese & Wine Reception | _____ |
| MON., AUG. 14 10 a.m.-noon | Hallmark Center Tour | _____ |
| MON., AUG. 14 Evening | Kansas City Gala | _____ |
| TUES., AUG. 15 10 a.m.-3 p.m. | Kansas City Sightseeing | _____ |
| WED., AUG. 16 10:30 a.m.-noon | Candyland Tour | _____ |
| WED., AUG. 16 Evening | IAMFES Awards Banquet & Reception | _____ |
| | FREE | _____ |
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| | \$25 ⁰⁰ adults | _____ |
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| | \$5 ⁵⁰ | _____ |
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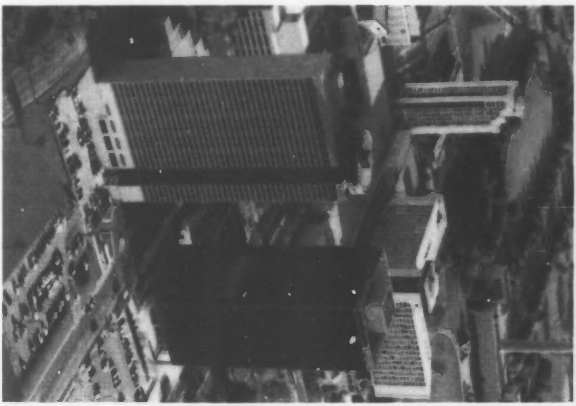
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August 13-17, 1989
Hyatt Regency Crown Center
Kansas City, Missouri**

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76th Annual Meeting Special Events Program

HALLMARK CENTER TOUR

August 14, Monday
10:00 a.m. - Noon

A guided tour of world famous Hallmark Cards production center. Seeing greeting cards being made is just the beginning of this tour. You can watch craftsmen at work, make your own ribbon bow or hear greetings in various languages. Located in the Crown Center Complex, adjacent to the Hyatt Regency, the Hallmark Visitors Center brings you the sights and sounds of Hallmark through 12 extraordinary exhibits. Hallmark produces 11 million greeting cards and 1.5 million other products each day. There is a special area of entertainment for children ages 5-12 called Kaleidoscope. You will exit onto the Crown Center Shopping Center where you may take lunch on your own at any of the many eateries, and get acquainted with the shopping complex. An all-weather skywalk will return you to your hotel. Cost: Adults *FREE*; Children *FREE*.

A DAY OF KANSAS CITY SIGHTSEEING

August 15, Tuesday
10:00 a.m. - 3:00 p.m.

A bus tour of historical westport district, the famous Plaza shopping area with its many fountains. Lunch at the Rozzelle Court Restaurant (Gourmet). A guided tour of the world famous Nelson-Atkins Museum Of Art. Time to browse the Plaza shops. Cost: Adults \$22.50; Children (12 and under) \$12.50.

CANDYLAND TOUR

August 16, Wednesday
10:30 a.m. - Noon

Your host will guide you through the plant where you can learn how chocolate is made and sample treats right off the production line. Witness the making of a batch of old-fashioned peanut brittle (and enjoy a complimentary bag of this specialty) Cost: \$5.50 Per Person.

OTHER SPECIAL EVENTS

We will have an information booth available for events you may attend on your own. Events in which you may be interested include Worlds of Fun and Oceans of Fun, K.C. Royals baseball game, American Heartland Theatre (Broadway Productions), Movie Theatre Playings at Crown Center, famous restaurants, etc. Remember, you will be in the heart of a beautiful complex with many things to see. We did not want to over schedule so you would have time to enjoy Crown Center. The Crown Center is only a 2 block walk from the Hyatt Regency.

SOCIAL EVENTS THROUGHOUT THE MEETING

Cheese & Wine Reception with Exhibits, Sunday Evening
K.C. Gala, Monday Evening A festive occasion
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Awards Banquet & Reception, Wednesday Evening

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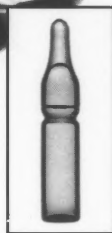
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IAMFES Audio Visuals Library

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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 of 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*, (2) *Salmonella*, (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 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)

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).

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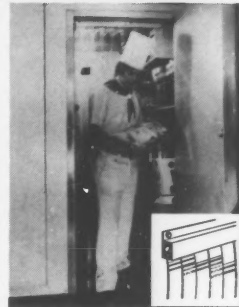
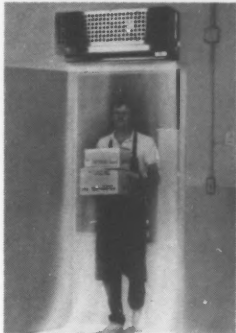
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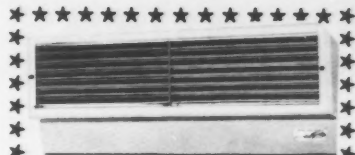


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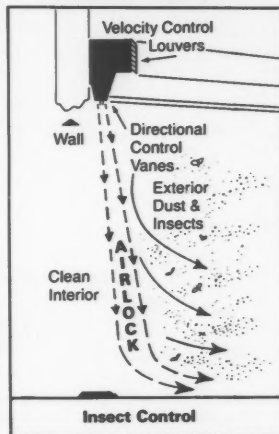
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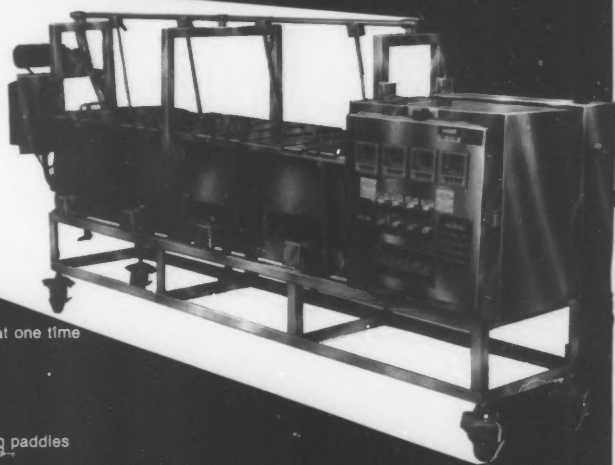
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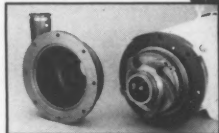
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3-A Sanitary Standards For Liquid Pressure and Level Sensing Devices

Number 37-01

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. Pressure and level sensing device specifications heretofore or hereafter developed which so differ in design, material, fabrication, or otherwise, as not to conform to the following standards but which, in the fabricator's opinion, are equivalent or better, may be submitted for the joint consideration of the IAMFES, USPHS, and DIC at any time.

A

SCOPE

A.1

These standards cover the sanitary aspects of devices used on liquid milk products equipment for sensing pressure and/or product level.

A.2

In order to conform with these 3-A Sanitary Standards, pressure and level sensing devices shall comply with the following design, material, and fabrication criteria.

B

DEFINITIONS

B.1

Product: Shall mean the liquid milk or milk product.

B.2

SURFACES

B.2.1

Product Contact Surfaces: Shall mean all surfaces that are exposed to the product, or from which liquid may drain, drop, or be drawn into the product.

B.2.2

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

B.3

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.

C

MATERIALS

¹The data for this series are contained in the following reference: *AISI Steel Products Manual, Stainless & Heat Resisting Steels, December 1974, Table 2-1, pp. 18-19.* Available from: American Iron & Steel Institute, 1000 16th St., NW, Washington, DC 20036.

²Steel Founders' Society of America, *Cast Metals Federation Bldg.*, 455 State St., Des Plaines, IL 60016.

C.1

All product contact surfaces shall be of stainless steel of the AISI 300 series¹ or corresponding ACT² 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.1.1

Rubber and rubber-like materials may be used for probe insulators, probe holders, gaskets, diaphragms, bonded coatings and coverings, and parts having the same functional purposes.

C.1.2

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 Rubber and Rubber-Like Materials, Number 18-00.

C.1.3

Plastic materials may be used for probes, probe insulators, probe holders, gaskets, diaphragms, bonded coatings and coverings, and parts having the same functional purposes.

C.1.4

Plastic materials when used for the above specified applications shall comply with the applicable provisions of the 3-A Sanitary Standards for Plastic Materials, Number 20-14, as amended.

C.1.5

Rubber and rubber-like materials and plastic materials 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 or sterilization.

C.1.6

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

37-01

C.1.7

Where materials having certain inherent functional properties are required for specific applications, such as level probes, ceramic materials may be used.

C.1.7.1

Ceramic materials shall be inert, non-porous, non-toxic, non-absorbent, insoluble, resistant to scratching, scoring and distortion when exposed to the conditions encountered in the environment of intended use and in cleaning and bactericidal treatment or sterilization.

C.1.8

Materials used for transmitting pressure and/or levels in diaphragm type devices shall be non-toxic.

C.1.9

All air under pressure used in contact with product or product contact surfaces shall be in compliance with the applicable material requirements of the 3-A Accepted Practices for Supplying Air Under Pressure in Contact with Milk, Milk Products and Product Contact Surfaces, Number 604-03.

C.2

Materials having a product contact surface(s) used in the construction of pressure and level sensing devices designed to be used in a processing system to be sterilized by heat and operated at a temperature of 250-degrees F (121-degrees C) or higher shall be such that they can be (1) sterilized by saturated steam or water under pressure at a temperature of at least 250-degrees F (121-degrees C) at 15-PSIG (103-kPa) and (2) operated at the temperature and pressure required for processing.

C.3

Non-product contact surfaces shall be of corrosion-resistant material 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 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 in the final fabricated form. (See Appendix, Section F.)

D.2

Permanent joints in metallic product contact surfaces shall be continuously welded. Welded areas on 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 in the final fabricated form.

D.3

Product contact surfaces not designed to be mechanically cleaned shall be readily accessible for cleaning and inspection either when in an assembled position

or when removed. Removable parts shall be readily demountable.

D.4

Sensing devices that are to be mechanically cleaned shall be designed so that the product contact surfaces of the sensing device can be mechanically cleaned, and all non-removable appurtenances thereto can be mechanically cleaned and are readily accessible for inspection.

D.5

Product contact surfaces shall be self-draining except for normal clingage.

D.6

Connections having product contact surfaces shall conform to the 3-A Sanitary Standards for Instrument Fittings and Connections, Number 09-07, and/or to the applicable provisions for welded sanitary product pipelines found in the 3-A Accepted Practice for Permanently Installed Sanitary Product-Pipelines, Number 605-02, and 3-A Sanitary Standards for Fittings, Number 08-17, rev.

D.7

Bonded rubber and rubber-like materials and bonded plastic materials in applications having product contact surfaces shall be bonded in such 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 or sterilization, the rubber or rubber-like material or the plastic material does not separate from the base material to which it is bonded.

D.8

Gaskets having a product contact surface shall be removable or bonded.

D.9

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

D.10

Radii

D.10.1

All internal angles of 135-degrees or less on product contact surfaces shall have radii of not less than 1/4-inch, except that:

D.10.1.1

Where smaller radii are required for essential functional reasons, such as those in sensing devices for high pressure gauges. In no case shall such radii be less than 1/32-inch.

D.10.2

The radii in gasket grooves or gasket retaining grooves, except those for standard 1/4-inch and smaller O-Rings, shall be not less than 1/32-inch.

D.10.3

The radii in grooves for standard 1/4-inch O-Rings shall be not less than 3/32-inch and for standard 1/8-inch O-Rings shall be not less than 1/32-inch.

D.10.4

Minimum radii for fillets of welds in product contact

surfaces shall be not less than 1/4-inch except that the minimum radii for such welds may be 1/8-inch when the thickness of one or both parts joined is less than 3/16-inch.

D.11

There shall be no threads on product contact surfaces.

D.12

Pressure and level sensing devices used in a processing system to be sterilized by heat and operated at a temperature of 250-degrees F (121-degrees C) or higher shall comply with the following additional criteria:

D.12.1

The construction shall be such that all product contact surfaces can be (1) sterilized by saturated steam or water under pressure at a temperature of at least 250-degrees F (121-degrees C) at 15-PSIG (103-kPa) and (2) operate at the temperature and pressure required for processing.

D.12.2

Devices that have a product contact surface(s) to be used in such a processing system, not designed so that the system is automatically shut down if the product pressure in the system becomes less than that of the atmosphere and cannot be restarted until the system is resterilized, shall have a steam or other sterilizing medium chamber surrounding the joint at the product contact surface between the fitting and the device.

D.12.3

The connection(s) on steam or other sterilizing medium chamber(s) for the steam or other sterilizing medium lines shall be such that the lines can be securely fastened to the connection(s). The lines shall be connected in a manner that they may be disconnected to allow the sterilizing medium chamber to be inspected and cleaned if necessary.

D.13

All air under pressure used in contact with product or product contact surfaces shall be in compliance with the applicable fabrication requirements of the 3-A

37-01
Accepted Practices for Supplying Air Under Pressure in Contact with Milk, Milk Products and Product Contact Surfaces, Number 604-03.

D.14

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

D.14.1

All interconnecting capillary or cable shall be corrosion-resistant, smooth and cleanable. If armored, the armor shall be of spiral stainless steel or plastic coated. There shall be no flexible, woven armor.

APPENDIX

E.

STAINLESS STEEL MATERIALS

Stainless steel conforming to the applicable composition ranges established by AISI¹ for wrought products, or by ACI³ for cast products, should be considered in compliance with requirements of Section C.1 herein. Where welding is involved, the carbon content of the stainless steel should not exceed 0.08%. The first reference cited in C.1 sets forth the chemical ranges and limits of acceptable stainless steel of the 300 series. Cast grades of stainless steel corresponding to types 303, 304, and 316 are designated CF-16F, CF-8, and CF-8M, respectively. These cast grades are covered by ASTM³ 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, on stainless steel sheets is considered in compliance with the requirements of Section D.1 herein.

These standards shall become effective November 1, 1989, at which time the 3-A Sanitary Standards for Liquid Pressure and Level Sensing Devices, Number 37-00 are rescinded and become null and void.

³Available from ASTM, 1916 Race St., Philadelphia, PA 19103.

3-A Accepted Practices For Permanently Installed Product and Solution Pipelines and Cleaning Systems Used in Milk and Milk Product Processing Plants

Number 605-03

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. Practices for permanently installed product and solution pipelines and cleaning systems specifications heretofore or hereafter developed which so differ in design, materials, and construction, or otherwise, as not to conform to the following practices but which in the manufacturers' or fabricator's opinion, are equivalent or better may be submitted for joint consideration of the IAMFES, USPHS and DIC at any time.

A

SCOPE

A.1

These 3-A Accepted Practices provide for the installation and mechanical cleaning and sanitizing of rigid pipelines used for milk and milk processing systems in which the connections are welded or are provided with C-I-P fittings. These 3-A Accepted Practices also include provisions for rigid cleaning solution lines and cleaning systems. The mechanical cleaning and sanitizing of individual items of equipment may be found in the 3-A Sanitary Standards covering the specific equipment. This practice does not pertain to cleaning systems used on dairy farms, or to large diameter piping used in milk drying or instantizing systems.

B

DEFINITIONS

B.1

C-I-P (Cleaned-In-Place)/Mechanical Cleaning: 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.2

C-I-P Pipelines: Shall mean rigid pipelines which have welded joints or have cleaned-in-place type fittings.

B.3

C-I-P Fittings: Shall mean gasketed fittings of such design as to form a substantially smooth, flush interior surface.

B.4

Product: Shall mean milk and milk products.

B.5

Product Contact Surfaces: Shall mean all surfaces that are exposed to the product or from which liquids may drain, drop, or be drawn into the product.

B.6

Solution Contact Surfaces: Shall mean the interior surfaces of the system which are used exclusively for supply and recirculation of cleaning and/or sanitizing solutions, except those used to supply concentrated cleaning and/or sanitizing materials to the point of use.

B.7

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

B.8

Solutions: Shall mean those solutions used for flushing, cleaning, rinsing, and sanitizing.

B.9

Tungsten Shielded Arc Method: Shall mean electric welding with a tungsten electrode shielded by an inert gas, to produce a butt fusion weld.

B.10

Non C-I-P Appurtenances: Shall mean those appurtenances such as plug valves, sample cocks, pumps and parts having the same functional purposes and are not designed for mechanical cleaning.

C

MATERIALS

C.1

The materials of equipment included in the product and solution pipelines and cleaning systems for which there are 3-A Sanitary Standards or Accepted Practices shall comply with the material criteria of the applicable standards or practices.

C.2

All other product contact surfaces shall be of stainless

¹The data for this series are contained in the following reference: *AISI Steel Products Manual, Stainless & Heat Resisting Steels, Dec. 1974, Table 2-1, pp. 18-19. Available from American Iron & Steel Institute, 1000 16th St., NW, Washington, DC 20036.*

²Steel Founders' Society of America, *Cast Metal Fabrication Bldg., 455 State St., Des Plaines, IL 60016.*

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steel of the AISI 300 series^{*1} or corresponding ACT^{*2} types (See Appendix, Section I.), 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 or heat resistant glass piping, except that:

C.2.1

Rubber and rubber-like materials may be used for gaskets and seals. These materials shall comply with the applicable provisions of the 3-A Standards for Rubber and Rubber-Like Materials, Number 18-00.

C.2.2

Plastic materials may be used for gaskets, seals and sight ports. These materials shall comply with the applicable provisions of the 3-A Standards for Plastic Materials, Number 20-14.

C.3

Solution contact surfaces shall be of stainless steel of the AISI 300 series^{*1} or corresponding ACT^{*2} types (See Appendix, Section I.), 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 or heat resistant glass piping, except that:

C.3.1

Rubber and rubber-like materials may be used for gaskets, seals, and short take down jumpers or connectors. These materials shall conform with the applicable provisions of the 3-A Standards for Rubber and Rubber-Like Materials, Number 18-00.

C.3.2

Plastic materials may be used for gaskets, seals, and short take down jumpers or connectors. These materials shall conform to the applicable provisions of the 3-A Sanitary Standards for Plastic Materials, Number 20-14.

C.4

Paper gaskets shall not be used.

D

FABRICATION

D.1

The fabrication criteria of equipment included in the cleaning systems for which there are 3-A Sanitary Standards or Accepted Practices shall be those of the applicable standards or practices.

D.2

All other product contact surfaces shall have a finish 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 in the final fabricated form. (See Appendix, Section J.)

D.3

All solution contact surfaces shall be at least as smooth as a No. 4 ground finish on stainless steel sheets except for those of castings for pumps. (See Appendix, Section J.) This does not preclude the use of a No. 2B finish for solution contact surfaces.

D.3.1

The solution contact surfaces of castings for pumps shall be at least as smooth as ACI Surface Indicator Scale SIS-1. (See Appendix, Section M.)

D.4

Product lines shall comply with the provisions of 3-A Standards for Polished Metal Tubing, Number 33-00.

D.5

Product and solution lines and equipment shall have C-I-P fitting or welded joints.

D.6

Welded joints shall be smooth and free from pits, folds, crevices, cracks, inclusions, or other defects. (See Section G.)

D.7

Removable fittings may be used with or without gaskets and shall be of such design as to form substantially flush interior joints.

D.7.1

Gaskets, when used, shall be self positioning and form a substantially flush interior joint.

D.8

Non C-I-P appurtenances such as plug valves, sample cocks, pumps and parts having the same functional purposes which have product or solution contact surfaces shall be readily demountable and easily disassembled for manual cleaning and sanitizing.

D.9

All internal angles of 135-degrees or less on product contact and solution contact surfaces shall have minimum radii of 1/4-inch except that:

D.9.1

The radii in gasket retaining grooves except for those for standard 1/4-inch and smaller O-Rings, shall be not less than 1/8-inch.

D.9.2.

The radii in grooves for standard 1/4-inch O-Rings shall be not less than 3/32-inch and for standard 1/8-inch O-Rings shall be not less than 1/32-inch.

D.9.3

Where smaller radii are required for essential functional reasons, such as pump impellers, the angle must be readily accessible for cleaning and inspection.

D.10

All product contact and solution contact surfaces shall be cleanable, either when in an assembled position or when removed. System appurtenances shall be accessible for inspection.

D.11

Lines and fittings for the application of air under pressure shall comply with the applicable provisions of 3-A Practices for Air Under Pressure, Number 604-03.

D.12

Non-Product contact surfaces shall be smooth, free of pockets and crevices and be readily cleanable.

E

INSTALLATION

E.1 The C-I-P pipelines shall be supported so that they remain in alignment and position. The support system shall be designed so as to preclude electrolytic action between support(s) and pipeline(s).

E.2 Each separate cleaning circuit, including product and solution lines, shall be provided with a sufficient number of access points, such as valves, fittings, or removable sections to make possible adequate inspections and examinations of representative interior surfaces.

E.3 Pipelines shall be drainable or self-draining and pitched to drain points.

E.4 Upon completion of welded pipeline installations and prior to use, all interior line and weld areas shall be subjected to circulation of cleaning solution of 0.5 to one-% alkalinity at a minimum of 160-degrees F for 30-minutes, followed by an adequate post rinse, followed by circulation of 0.5% minimum and one-% maximum phosphoric or nitric acid solution at 150 to 180-degrees F for ten-minutes to clean all interior surfaces of ferric impurities. (This is not intended for passivation.) This treatment shall be followed by an adequate rinse.

F LAYOUT AND ENGINEERING REQUIREMENTS

F.1 Prior to installation, a drawing or equivalent plan shall be made available to the regulatory agency by the processor for each installation, or subsequent addition or modification, showing each permanent circuit to be cleaned.

F.2 C-I-P systems shall be designed so that the suction intake of the primary circulating pump shall be flooded at all times during the cleaning cycle.

F.3 Solution temperature shall be automatically controlled by the use of a temperature control system with a response range of \pm five-degrees F.

F.4 The system shall be provided with a recording thermometer or similar device having a scale range of 60-degrees to 180-degrees F with extension of scale on either side permitted: graduated in time scale divisions of not more than 15-minutes. Between 110-degrees and 180-degrees F, the chart shall be graduated in temperature divisions of not more than two-degrees F, spaced not less than 0.040-inch (one-mm) apart, and be accurate within \pm two-degrees F. The sensor shall be protected against damage at 212-degrees F. The sensing element of the recording thermometer shall be located in the coolest portion of the return solution line.

F.5 All connections between any solution circuit and any

product circuit shall be effectively separated to positively prevent the commingling of the product and solution during processing. (See Appendix, Section N.)

F.6 There shall be no cross-connection(s) between the safe water supply and any unsafe or questionable water supply, or any source of pollution through which the safe water supply might become contaminated. For example, a connection between the water supply piping and make-up tank, unless protected by an air gap or effective backflow preventor constitutes a violation of this practice.

G INSTALLATION WELDING REQUIREMENTS

G.1 All welding of sanitary product pipelines and solution lines shall be made by the Tungsten Shielded Arc Method or an equally satisfactory method. The following precautions shall be taken:

G.1.1 Inert back-up gas shall be used to protect and control the interior of the weld.

G.1.2 The welding surface (interior, face and exterior) shall be cleaned and freed of all foreign matter and surface oxide before welding. Iron free abrasive shall be used when cleaning surfaces.

G.1.3 All tube and fitting ends shall be square cut and deburred.

G.1.4 Welding procedures shall assure uniform and complete penetration of the weld at all times.

G.1.5 All welds having pits, craters, ridges, or imbedded foreign materials shall be removed and the joints shall be properly re-welded.

G.1.6 Internal and external grinding and/or polishing of pipeline welds is not required. If grinding and/or polishing of external weld surfaces is desired by either the installer or the user, such finishing shall be delayed until after inspection and acceptance of the welding by the applicable regulatory agencies unless internal weld surfaces are easily assessable for inspection.

G.1.7 An acceptable sample weld piece shall be provided when required.

G.1.8 A boroscope or other acceptable inspection device should be available to use to inspect representative welds.

H CLEANING AND SANITIZING PROCEDURES

H.1 A mechanical flushing, cleaning, rinsing and sanitizing regimen which has been demonstrated to be effective shall be employed. Because of the possibilities of corrosion, the recommendations of the cleaning

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compound manufacturer shall be followed with respect to the time, temperature and the concentration of specific acid or alkaline solutions and sanitizers. To insure proper strength of solution and to avoid corrosion, the cleaning compound shall be completely dissolved or dispersed prior to circulation. See Appendix, Section P for one regimen found to be satisfactory.

H.2

A description of the cleaning regimen which has been demonstrated to be effective for each circuit shall be made available by the processor.

APPENDIX

NOTE: This appendix is an adjunct to the preceding sections of these practices. Its purpose is to provide information and guidance in the design, fabrication and installation of rigid pipelines and cleaning systems.

I

STAINLESS STEEL MATERIALS

Stainless steel conforming to the applicable composition ranges established by AISI for wrought products, or by ACI for cast products, should be considered in compliance with the requirements of Section C.2 herein. Where welding is involved, the carbon content of the stainless steel should not exceed 0.08%. The reference cited in C.2 sets forth the chemical ranges and limits of acceptable 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 ASTM⁵ specifications A351/A351M, A743/743M and A744/744M.

J

PRODUCT CONTACT SURFACE FINISH

Surface finish equivalent to 150 grit or better as obtained with silicon carbide, properly applied on stainless steel sheets, is considered in compliance with the requirements of Sections D.2 and D.3.

K

FLOW RATES

A circulating unit, consisting of a motor driven pump and solution tank, should be provided and deliver a minimum flow rate of five feet per second (FPS) per line when cleaning. In split flow arrangements, a pressure differential should be maintained or flow shall be sequenced through multiple paths to assure a minimum flow rate of five-FPS. In all cases, sufficient flow should be maintained to assure that the lines are fully flooded at all times. Table-1 gives examples of recommended flow rates for C-I-P systems to meet the five-FPS mean flow velocity.

TABLE-1. RECOMMENDED FLOW RATES TO ACHIEVE FIVE-FPS.

| Sanitary Tube Size | | Flow Rate |
|--------------------|-------|--------------------|
| OD | ID | |
| Inches | | Gallons Per Minute |
| 1.0 | 0.875 | 9.4 |
| 1.5 | 1.375 | 24 |
| 2.0 | 1.875 | 43 |
| 2.5 | 2.375 | 69 |
| 3.0 | 2.875 | 102 |
| 4.0 | 3.850 | 182 |

These flow rates are usually adequate for cleaning pipelines which handle milk and other relatively low-fat products. However, for more viscous products, such as cream, ice cream mix, or concentrated milk products, it may be necessary to change these velocities and/or other cleaning variables. Other variables to be considered are time, temperature, and concentration of cleaning formulations.

L

TYPES OF WELDS

L.1

Automatic Welds: A fully automatic weld is described as that made by equipment which starts and completes the weld, strikes, and controls the arc with no manual adjustment of control during the welding cycle and will consistently make repetitive welds.

L.2

Semi-automatic Weld: A semi-automatic weld is described as that made by equipment which requires manual strike and/or manual control during the welding cycle and will consistently make repetitive welds.

L.3

Hand Weld: A weld in which the positioning of the arc is manually controlled.

M

SPECIFICATIONS FOR VISUAL INSPECTION OF CAST SURFACE FINISH

M.1

Because RMS (root mean square) values are applicable strictly to machined surfaces, it is essential to use a scale of cast surfaces in designating the general surface smoothness desired on castings. The reason for establishing a visual standard is to overcome the obvious inadequacy of any arithmetical or geometrical measuring system when applied to the surface of a casting.

M.2

The ACI SURFACE INDICATOR SCALE is the one to be used for the surfaces of castings for pumps or other appurtenances. (See subsection D.3.1 of these Practices.) The scale provides a measure of the degree of general smoothness which can be attained on alloy castings by currently available processes. There are four surfaces shown on the scale.

M.3

Copies of the SPECIFICATIONS FOR VISUAL IN-

⁵Available from ASTM, 1916 Race St., Philadelphia, PA 19103.

SPECTION OF CAST SURFACE FINISH as well as the SURFACE INDICATOR SCALE can be obtained from the Alloy Casting Institute Division, Steel Founders' Society of America, Cast Metal Fabrication Bldg., 455 State St., Des Plaines, IL 60016.

N

SEPARATION OF CLEANING AND PROCESSING CIRCUITS

N.1

During processing, pipelines and equipment used to contain or conduct milk and milk products shall be effectively separated from tanks or circuits containing cleaning and/or sanitizing solutions. This can be accomplished by:

N.1.1

A complete physical separation of all tanks, pipelines and circuits; or

N.1.2

Separation is by at least two automatically controlled valves with a drainable opening to the atmosphere between the valves. The opening to the atmosphere should be equal to the largest pipeline size and the valves should be position detectable. The installation of the valves shall include an automatic fail safe system to prevent product contamination with cleaner and/or sanitizing solutions.

N.2

The design of the product and cleaning and/or sanitizing solution pipeline system should provide for the permanent installation of as much of the pipeline as possible.

N.3

All unnecessary bypass and return connections should be eliminated.

N.4

The piping configuration should enable all processing to be completed without piping changes and yet permit quick conversion to cleaning circuits, except for those changes required for separation of Grade A products and non-Grade A products.

O

INFORMATION PLATE

O.1

Cleaning solution pumps designed and used solely for C-I-P recirculation shall be provided with an information plate permanently affixed to the pump, next to the name plate stating: "This pump shall be used solely for pumping cleaning and/or sanitizing solutions."

P

CLEANING AND SANITIZING EXAMPLE

P.1

All solution and product contact surfaces such as down tubes, fill tubes, manhole gaskets, petcocks, plug valves,

check valves, and air purgers not cleanable by mechanical cleaning and sanitizing procedures shall be cleaned and sanitized manually.

P.1.1

Immediately after concluding the day's operations, all connections between cleaned-in-place lines and processing equipment which are not included in the cleaning circuit shall be removed, the openings capped, bypass connections made, and the lines flushed thoroughly with tempered water (not to exceed 120-degrees F, entering circuit) continuously discarding the rinse water near the downstream end of the solution return line until the discarded effluent is clear.

P.1.2

Circulate an effective detergent solution for a period of time at a concentration and temperature capable of effectively removing the soil residue in the circuit.

P.1.3

Thoroughly rinse the detergent solution from the circuit.

P.1.4

Circulate an acid detergent, when needed, as a supplement to the routine circulation. Follow this acid detergent treatment with a thorough rinse.

P.1.5

Sanitize all product contact surfaces immediately before use with one or a combination of the following commonly used methods:

P.1.5.1

Circulation of water at a minimum temperature of 170-degrees F (at the discharge end) through the circuit for five-minutes and drained.

P.1.5.2

Pumping of an approved chemical sanitizer solution of acceptable strength and recommended temperature through product lines and equipment for at least one-minute and drained. Halogen based sanitizers (chlorine and iodine) allowed to remain on surfaces for longer than necessary may cause corrosion damage.

P.1.5.3

Exposure to steam for at least 15-minutes after the temperature of the drainage at the outlet has reached 170-degrees F or for five-minutes after the temperature of the drainage at the outlet has reached 200-degrees F.

NOTE: Approved sanitization procedures and related recommendations are provided in detail in the Grade "A" Pasteurized Milk Ordinance -- 1987 Recommendations of the U.S. Public Health Service/Food and Drug Administration.

These accepted practices shall become effective November 1, 1989, at which time the 3-A Accepted Practices for Permanently Installed Sanitary Product-Pipelines and Cleaning Systems, with Amendment, Number 605-02 are rescinded and become null and void.

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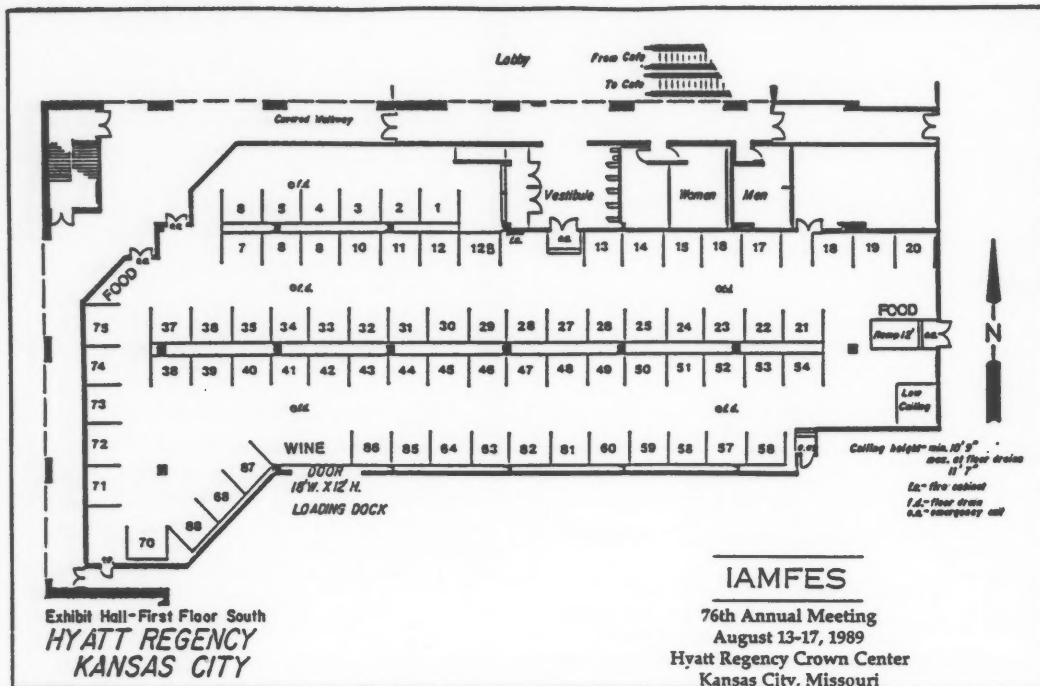
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76th IAMFES Annual Meeting Exhibitor Listing

(as of June 15)



1989 IAMFES Exhibitors Descriptions

- Advanced Instruments**, Needham Heights, MA, Booth #24 — Manufacturer of milk cryoscopes and Fluorophos™ three minute test for residual phosphatase in dairy products.
- Ampco Pumps**, Milwaukee, WI, Booth #39 — Ampco "D" series solution pumps designed solely for pumping, cleaning and/or sanitizing solutions. Conforms to 3A's new standard 605-03.
- Atkins Technical, Inc.**, Gainesville, FL, Booth #44 — Fast response, high accuracy digital thermometers and temperature probes for foodservice applications, thermocouples, thermistors.
- Becton Dickinson Microbiology Systems**, Cockeysville, MD, Booth #38 — Products utilized for the cultivation and identification of foodborne pathogens, including *Salmonella* and *Listeria*.
- BIOSAN Laboratories**, Ferndale, MI, Booth #62 — Food microbiology services; Microbiological Test Kits for measuring bacteria, yeast and molds in foods and on surfaces.
- Capitol Vial, Inc.**, Fultonville, NY, Booth #23 — Vials - Sterile, Leakproof, Airtight - FDA approved - Up to 16 colors offered. Also will be displaying unique insulated shippers and racks. Ask about our unique guarantee.
- Chempar, Div. of Lipha Chemicals, Inc.**, Milwaukee, WI, Booth #72 — Full line of Maki and Rozol brand rodenticides and the Ratstraunt Bait Station.
- DSI Process Systems**, St. Louis, MO, Booth #43 — Full line sanitary processing capabilities and environmentally sound food ingredient slurry and handling systems from the Dri-Flo Co. Division.
- Deibel Laboratory/Summit Laboratory Supply**, Madison, WI, Booth #31 — Blendo Flask for *Salmonella* and *Listeria* Preenrichment cultures.
- Difco Laboratories**, Detroit, MI, Booth #14 — Dehydrated Culture Media, featuring 4 new media for *Listeria* as well as media for *Yersinia* and hemorrhagic *E. coli*.
- Diversey Wyandotte Corp.**, Wyandotte, MI, Booth #36 — Shur Graph CIP monitoring and documentation system.
- J. T. Eaton & Company, Inc.**, Twinsburg, OH, Booth #05 — Rat and Mouse Bait, Bait Stations and Glue Boards, Bird Repellent and Squirrel Repellent, Fly Traps, Roach Traps.
- Educational Foundation of the National Restaurant Association**, Chicago, IL, Booth #06 — Educational training materials for owners and operators, manufacturers of food related products, i.e. Applied Foodservice Sanitation.
- Educational Testing Service**, Langhorne, PA, Booth #32 — Brochures describing the Food Protection Certification Program - A Test to determine knowledge to prevent foodborne illness.
- Charles Felix Associates**, Leesburg, VA, Booth #04 — Publishes *Food Protection Report* and *Food Talk* and represents the Foodservice and Packaging Institute and the Packaged Ice Association.
- Fluid Equipment Company, Inc.**, Independence, MO, Booth #65 — Aqua-Aerobic/SBR Systems, Rovalve cast stainless knifegate valves, Bran & Luebbe/Stainless Steel metering pumps and systems, Sani-Tech/Sanitary process tubing and fittings for food and dairy.
- Foss Food Technology Corp.**, Eden Prairie, MN, Booth #21 — Instrumentation to accomplish Compositional Analysis of Milk and Dairy products. Information will be available on On-Line Standardization as well as Somatic Cell Counting.
- H. B. Fuller Co., Monarch Division**, Minneapolis, MN, Booth #42 — Dairy and Food Sanitation Programs.
- GENE-TRAK Systems**, Framingham, MA, Booth #41 — GENE-TRAK will be exhibiting a full line of Colorimetric DNA Probe Assays for the rapid detection of food borne pathogens.

- GO-JO Industries, Inc.**, Akron, OH, Booth #17 — Purl Total Hand Sanitizing System, features antibacterial lotion soap and instant hand sanitizer. System helps reduce risk of foodborne illness outbreak.
- Golden Star, Inc.**, North Kansas City, MO, Booth #75 — Antimicrobial Wet and Dust Mops, Antimicrobial Mats, Entrance Mats and Matting, Indoor and Outdoor Mats and Matting.
- Gundle Lining Systems, Inc.**, Houston, TX, Booth #09 — Manufactures and installs High Density Polyethylene Liner in 20 mil to 140 mil thick and in 22.5 ft. seamless widths.
- Hach Company**, Ames, IA, Booth #49 — Analysis systems for coliforms, total bacteria and yeast & mold. New ColiQuick enzyme MPN test, PourRite MF ampules and dip testers.
- Henkel Corporation, Chemical Services Div.**, Amber, PA, Booth #50 — New, Patented Sanitizer Technology; RO/UF Membrane Cleaning Systems; specialized cleaners for all Food/Dairy Industries.
- Idetek, Inc.**, San Bruno, CA, Booth #47 — Idetek, Inc. will feature new diagnostic technology for quick tests of milk and other food products for antibiotics and other contaminants.
- IDEXX Corp.**, Portland, ME, Booth #27 — IDEXX is an international biodetection company. Products include Diagnostic Tests for poultry, livestock, animals and equine.
- Integrated BioSolutions, Inc.**, Princeton, NJ, Booth #48 — The Lumac Biocounter® for rapid line hygiene and microbial determinations, and the MicroSys Microbiology Information Management System.
- Kansas City Valve and Fitting Co.**, Kansas City, MO Booth #11 — Tube fittings, valves and fluid system components.
- Kirkegaard & Perry Laboratories**, Gaithersburg, MD, Booth #67 — Labeled or unlabeled affinity purified antibodies to *Salmonella* (CSA-1), *E. coli* 0157:H7 and *Listeria* species, positive control antigens and complementary products.
- Kness Mfg. Co., Inc.**, Albia, IA, Booth #74 — Manufacturer of the "Original" ¹Ketch-All Automatic Mousetrap, ²Single Catch Mousetrap, "SNAP-E" ³Big SNAP-E Rat Trap - easy bait, easy set, easy release. "Complete line of live catch animal traps, new and better - "KAGE-ALL".
- Los Alamos Diagnostics**, Los Alamos, NM, Booth #66 — Test kits and instrumentation for rapid determination of bacterial and yeast contamination of raw materials, final products and process equipment.
- Michelson Laboratories, Inc.**, Commerce, CA, Booth #54 — Independent analytical testing laboratory to conduct chemical, and microbiological analysis. Also offering control samples for Infra Red Milk Analyzer and Somatic Cell Counter.
- Minnesota Valley Testing Laboratories, Inc.**, New Ulm, MN Booth #40 — A complete line of analytical testing services is available, including microbiological analyses, and organic and inorganic chemical analyses.
- Nasco**, Fort Atkinson, WI, Booth #12 — Whirl-Pak sampling bags are on display in Nasco's booth. Whirl-Paks are the perfect sample container, for any sampling purpose.
- National Automatic Merchandising Association**, — National trade association of the merchandise vending machines and contract foodservice management industry.
- The National Food Laboratory, Inc.**, Dublin, CA, Booth #37 — Complete, confidential, Contract R&D Services including the areas of microbiology and sanitation. These programs provide technical expertise in GMP Sanitation audits, QC and HACCP programs, microbiology. Challenge, TDT and Inoculated Pack studies.
- Nelson-Jameson, Inc.**, Marshfield, WI, Booth #46 — Experts in supplying Food and Dairy Laboratories with a complete selection of glassware, reagents, equipment and culture media. Reliable service.
- Organon Teknika Corp.**, Durham, NC, Booth #73 — Listeria-Tek: Rapid ELISA Detection for Listeria sp. Salmonella-Tek: Rapid ELISA Detection System for Salmonella sp. Aflatoxin M₁: ELISA
- Oxoid U.S.A., Inc.**, Columbia, MD, Booth #25 — Salmonella Rapid Test Kit, various Toxin Detection Kits. Aflatoxin Detection Kits, Dehydrated Microbiological Culture Media, and related laboratory products.
- Penicillin Assays, Inc.**, Malden, MA, Booth #16 — CHARM II Test for Antibiotics and Mycotoxins, Computer Interfacing with CHARM II, CHARM Inhibition Assay - Sensitive Disc Diffusion Test for Antibiotics.
- RCR Scientific, Inc.**, Goshen, IN, Booth #45 — Redigel Agar Replacement System
- REMEL**, Lenexa, KS, Booth #15 — Prepared culture media, bottled media, environmental sampling plates, dilution broths, quality control media for food and dairy testing.
- Radiometer America, Inc.**, Westlake, OH, Booth #07 — Malthus 2000 Microbiology System. Detects levels and activity of micro-organisms with results obtainable in hours, automatically.
- Silliker Laboratories, Inc.**, Chicago Heights, IL, Booth #28 — Food industry services in the areas of Microbiology, Chemistry, Research, Information Services, Technical Services and Consulting will be exhibited.
- SmithKline Animal Health Products**, West Chester, PA, Booth #08 — PENZYME[®] Antibiotic Residue Screen Test for Milk; SIGNAL[®] Detection Tests for mycotoxins and sulfamethazine; SIGNAL Microorganism Screening System for environment.
- The Soap and Detergent Association**, New York, NY, Booth #26 — Generic educational literature on cleaning products, information for managers responsible for environmental sanitation, materials on preventing occupational skin diseases.
- Sparta Brush Co., Inc.**, Sparta, WI, Booth #35 — Specialized Brushes for the Milk, Food and other Process Industries, featuring Sparta's Tri-Zone Color Coded Brush Program to prevent Cross-contamination.
- 3-A Sanitary Standards Symbol Council**, Waukesha, WI, Booth #02 — Trustees and Staff will be on hand to explain the background and function of the 3-A Symbol Program. Literature and application for 3-A Symbol authorization will be available.
- 3M Microbiology Products**, St. Paul, MN, Booth #13 — 3M Petrifilm™ plates for bacteria identification, 3M Report™ Salmonella immunoassay.
- The Tintometer Company**, Williamsburg, VA, Booth #01 — The Tintometer Company will display visual and electronic colorimeters and spectrophotometers for use in color quality control. Also, water analysis equipment.
- Tufco Flooring**, Gentry, AR, Booth #22 — A 6 layer laminated flooring system which is non-skid, non-porous and chemical resistant. USDA and OSHA accepted. Also the R-19 Patch Kit.
- 23rd International Dairy Congress 1990**, Montreal, Quebec, Canada, Booth #12B — Promotional material for the 23rd International Dairy Progress and Dairy Exhibition to be held in Montreal, 8-12 October 1990.
- Wescor, Inc.**, Logan, UT, Booth #33 — OMNISPEC™ instrument for measuring total counts, antibiotics, abnormal milk, psychrotrophs, coliforms, etc. Mas-D-Tec™ for Cowside Mastitis detection.
- West Agro, Inc.**, Kansas City, Booth #18 — Effects of three (3) common germicides on milk residue levels and complete new line of cleaners and sanitizers for food and dairy plant sanitation.
- Vicam-Aflatest**, Somerville, MA, Booth #52 — Mycotoxin testing system.
- Vitek Systems, Inc.**, St. Louis, MO, Booth #56 — VITEK is committed to provide the Milk and Food industry with RAPID Microbiology Systems. Visit our exhibit for details.
- Walker Stainless Equipment Co., Inc.**, New Lisbon, WI, Booth #29 — Filter Flo Transport Tanker Manhole Filter.
- Weber Scientific**, East Windsor, NJ, Booth #10 — Gerber and the New Modified Babcock Butterfat Tests, Bacteria Count supplies featuring the New Disposable Dilution Bottle. Antibiotic Residue Tests.
- X-O Corporation**, Dallas, TX, Booth #34 — Odor Neutralizer for every type of odor elimination. X-O is natural, organic, biodegradable, non-toxic, non-flammable, safe around people and pets. It is concentrated and guaranteed.

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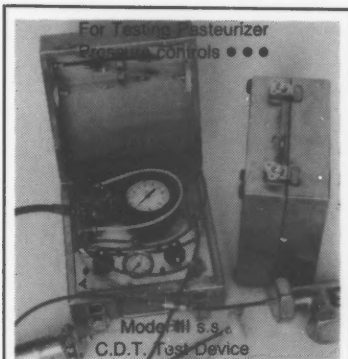
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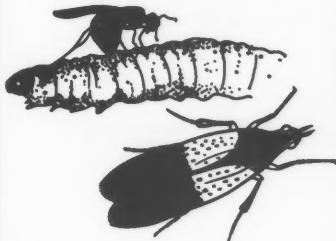
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Coming Events

1989

AUGUST

• **7-9, Food Engineering**, sponsored by The Center for Professional Advancement to be held in East Brunswick, NJ. For more information, contact: The Center for Professional Advancement, Registrar, PO Box 964, East Brunswick, NJ 08816-0964 (201)613-4535.

• **9-10, The Second Annual Fruit Juice Authenticity Workshop** will be sponsored by General Physics Corporation. It will be held at the Washington, D.C. Dulles Airport's Ramada Renaissance Hotel. For more information or to register, contact the Course Registrar, Frances McGeehan, General Physics Corp, (301)290-2300.

• **13-18, The Society for Industrial Microbiology** announces the 1989 Annual Meeting to be held at the Westin Hotel, Seattle, Washington. For more information, contact: Mrs. Ann Kulback, Business Secretary, Society for Industrial Microbiology, PO Box 12534, Arlington, VA 22209-8534 703/941-5373.

• **14-18, Biotechnology: Principles and Processes** to be held at the Massachusetts Institute of Technology, Cambridge, Massachusetts. For more information, contact: Director of Summer Session, MIT, Room E19-356, Cambridge, MA 02139 or Anthony J. Sinskey, Dept. of Biology, MIT, Cambridge, MA 02139 617/253-6721.

• **22-23, Food Plant Sanitation Workshop** to be held at the Cherry Hill Sheraton Poste Inn, Cherry Hill, New Jersey. For more information, contact: The Registrar at (913) 537-4750 or 1-800-633-5137.

SEPTEMBER

• **11, Pesticide Applicator Certification Seminar**, Okumura Biological Institute, Clarion Hotel, Sacramento, CA. Contact: George Okumura, 6669 14th St., Sacramento, CA 95831 916/421-8963.

• **11-15, Food Microbiology Short Course**. Sponsored by the University of California and University Extension. To be held at the Dept. of Food Science and Technology, Cruess Hall, UC Davis Campus. For further information, contact: Kathryn J. Boor, Food Science and Technology, University of California, Davis, CA 95616 (916)752-1478.

• **12-14, Basic Pasteurization Course**, to be held at Howard Johnson, 8887 Gateway West, El Paso. For more information, contact: Ms. Janie F. Park, TAMFES, PO Box 2363, Cedar Park, TX 78641-2363 512/458-7281.

• **13-15, Sensory Evaluation of Foods**, sponsored by the American Association of Cereal Chemists will be held in

St. Paul, MN. For more information, contact: AAOC, 3340 Pilot Knob Rd., St. Paul, MN 55121 (612) 454-7250.

• **14-15, 13th Annual Wisconsin Laboratory Association Education Conference** will be held at the Oshkosh Hilton and Convention Center in Oshkosh, Wisconsin. For registration information, contact: Laura Rauschl, Program Chairman, c/o Schreiber Foods, Inc. PO Box 19010, Green Bay, WI 54307-9010 (414) 437-7601.

• **18-21, Sensory Descriptive Flavor Analysis** sponsored by the Center for Professional Advancement will be held in New Brunswick, NJ. For more information, contact: Registrar, PO Box 964, East Brunswick, NJ 08816-0964.

• **18-22, Food Protection and Quality Assurance Technology Short Course**. Sponsored by the Food Sanitation Institute, EMA, and Michigan State University, East Lansing, MI. Contact: Dr. William Haines, Food Industry Institute, Michigan State University (517) 355-8295.

• **19-20, Biotechnology of Cereal Products**, sponsored by the American Association of Cereal Chemists, will be held in St. Paul, MN. For more information, contact AAOC, 3340 Pilot Knob Rd., St. Paul, MN 55121 (612) 454-7250.

• **19-21, New York Association of Milk and Food Sanitarians**, will hold its annual meeting in Buffalo at the Sheraton-Buffalo Airport Hotel. For information concerning the meeting, contact: Paul Dersam, 27 Sullivan Rd., Alden, NY 14004, 716/937-3432.

• **25-27, Acceptance Testing**. Developing a product acceptance capability; qualification of employees and consumers; procedures for laboratory, central location, and home-use testing; design and analysis of acceptance tests. For more information contact: Marjorie Sterling Stone 415/365-1833.

• **25-28, 103rd AOAC Annual International Meeting and Exposition** to be held in St. Louis, Missouri. For more information contact: Margaret Ridgell, AOAC, Suite 400, 2200 Wilson Blvd, Arlington, VA 22201-3301. 703/522-3032.

• **25-27, Indiana Environmental Health Association Fall Conference** will be held at the Howard Johnson, Lafayette, Indiana. For more information, contact: Tammy Barrett, IN State Board of Health, (317) 633-0173.

• **27-29, Colonization Control of Human Bacterial Enteropathogens in Poultry**, will be held in Atlanta, Georgia. It is sponsored by the USDA, Agricultural Research Service. For more information, contact: Dr. L.C. Blankenship, USDA, ARS, Russell Research Center, PO Box 5677, Athens, GA 30613 (404) 546-3152.

• **27-28, The 1989 Annual Convention of the South Dakota Dairy Association** will be held at the Ramkota Inn, Sioux Falls, SD. For information, contact: Dr. John Parsons,

Dairy Science Dept., SDSU, Box 2104, Brookings, SD 57007 605/688-4116.

•27-29, **Liquitec Expo '89**. For more information contact: Carolyn Mesce, Marketing Manager, Liquitec Expo Inc., PO Box 630, West Paterson, New Jersey 07424 201/256-0011.

OCTOBER

•1-4, **Fourteenth Annual Tropical and Subtropical Fisheries Technological Conference of the Americans**. To be held at Buckhead Holiday Inn, Atlanta, GA. For more information, contact: Keith Gates, The University of Georgia Marine Extension Service, PO Box Z, Brunswick, GA 31523 (912) 264-7268.

•11-13, **Food Preservation**, sponsored by the American Association of Cereal Chemists will be held in San Diego, CA. For more information, contact: AAOC, 3340 Pilot Knob Rd., St. Paul, MN (612) 454-7250.

•17-18, **AIB Food Plant Sanitation Workshop for Food Plant Employees**, will be held at the Red Lion Inn, San Jose, California. For more information contact: The Registrar at (913) 537-4750 or 1-800-633-5137.

•22-24, **National Frozen Food Convention and Exposition** to be held at the Hilton, Atlanta, GA. For information on the convention, contact: National Frozen Food Association, PO Box 398, Hershey, PA 17033 (717) 534-1601, or the American Frozen Food Institute, 1764 Old Meadow Lane, Suite 350, McLean, VA 22102 (703) 821-0770.

•23-24, **Pests Associated with Food Industry and Environmental Sanitation Seminar**, Okumura Biological Institute, Holiday Inn, Elk Grove Village, IL. Contact: George Okumura, 6669 14th St., Sacramento, CA 95831 916/421-8963.

•23-25, **Quality Control and Stability and Testing**. Organizational approaches to establishing product quality monitoring systems within manufacturing and R&D: methods for measuring product quality and stability, including design and analysis. For more information, contact: Marjorie Sterling Stone 415/365-1833.

•23-25, **California Association of Dairy & Milk Sanitarians** will be held at the Holiday Inn, Visalia, CA. For more information, contact: Jack Coppes (213) 699-4313.

•25-26, **Advanced Course on Pest Recognition and Food Industry Problems**, Okumura Biological Institute, Holiday Inn, Elk Grove Village, IL. Contact: George Okumura, 6669 14th St., Sacramento, CA 95831 916/421-8963.

NOVEMBER

•4-9, **EMA 1989 National Educational Conference and Trade Show** to be held in Clearwater Beach, Florida at the Holiday Inn Surfside. For more information, contact EMA headquarters at 1019 Highland Ave., Largo, FL 34640 (813) 586-5710.

•6-8, **1989 Food Processing Waste Conference**, will be held at the Omni International Hotel, Atlanta, GA. For more information, contact: Edd Valentine or Chuck Ross, Georgia Tech Research Institute, Economics Development Laboratory, Environment, Health and Safety Division, O'Keefe Bldg, Atlanta, GA 30332 (404) 894-3412.

•9-10, **Water Activity**, sponsored by the American Association of Cereal Chemists, will be held in Chicago, IL. For more information, contact: AAOC, 3340 Pilot Knob Rd., St. Paul, MN 55121 (612) 454-7250.

•11-15, **Dairy and Food Industries Supply Assoc., Inc. McCormick Place**, Chicago, Illinois.

•13-14, **Tailoring Dairy Packaging & Distribution - Tomorrow's Needs** sponsored by the International Dairy Federation and the U.S. National Committee of the International Dairy Federation. This Seminar will be held in conjunction with the DFISA Expo in Chicago. For more information, contact: Harold Wainess, Secretary, U.S. National Committee of the IDF, 464 Central Ave., Northfield, IL 60093 (312) 446-2402.

•15-17, **Gum Chemistry and Technology**, sponsored by the American Association of Cereal Chemists, will be held in Chicago, IL. For more information, contact: AAOC, 3340 Pilot Knob Rd., St. Paul, MN 55121 (612) 454-7250.

DECEMBER

•4, **Pesticide Applicator Certification Seminar**, Okumura Biological Institute, Clarion Hotel, Sacramento, CA. Contact: George Okumura, 6669 14th St., Sacramento, CA 95831 916/421-8963.

•5-6, **Pests Associated with Food Industry and Environmental Sanitation Seminar**, Okumura Biological Institute, Clarion Hotel, Sacramento, CA. Contact: George Okumura, 6669 14th St., Sacramento, CA 95831 916/421-8963.

•6-7, **Starch: Structure, Properties, and Food Uses**, sponsored by the American Association of Cereal Chemists, will be held in Chicago, IL. For more information, contact: AAOC, 3340 Pilot Knob Rd, St. Paul, MN 55121 (612) 454-7250.

•7-8, **Advanced Course on Pest Recognition and Food Industry Problems**, Okumura Biological Institute, Clarion Hotel, Sacramento, CA. Contact: George Okumura, 6669 14th St., Sacramento, CA 95831 916/421-8963.

To insure that your meeting time is published, send announcements at least 90 days in advance to: IAMFES, PO Box 701, Ames, IA 50010 or Fax 515-232-47

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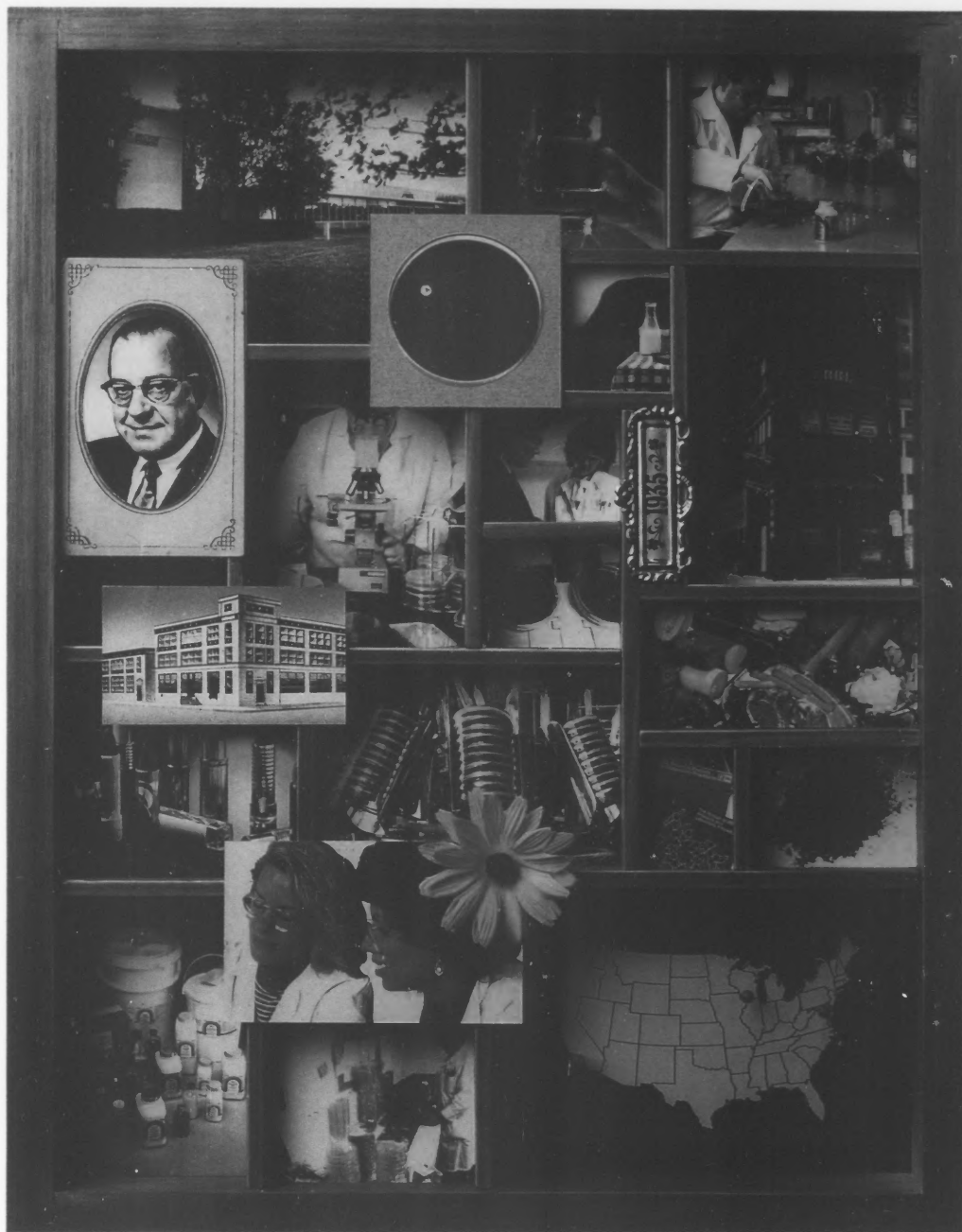


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