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DAIRY, FOOD AND ENVIRONMENTAL

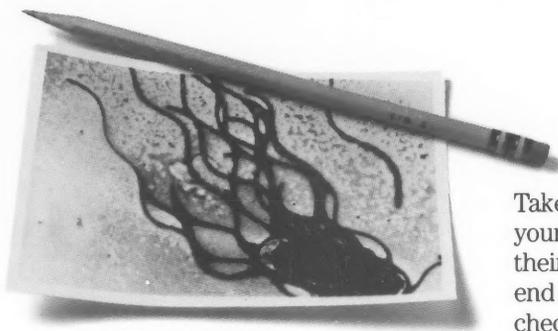
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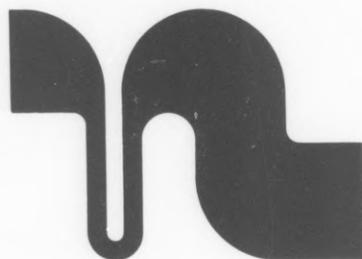
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Thoughts From the President . . .

By
Ron Case
IAMFES President



Daily reading of the newspapers and listening to TV news allows us to watch stories slowly unfold. I would have thought it was joke if a year ago someone told me that in 1989 the Berlin Wall would come tumbling down; there would be non-Communists leading Eastern European countries; that information would flow easily across what used to be the Iron Curtain, and that the United States and Western Europe would be investing money and manpower to help develop Eastern Europe. Things are rapidly changing.

There seems to be a more optimistic view of the world as one community. The change in outlook makes me think of the International part of IAMFES' name. IAMFES is an international association and not just a North American association. Most of our members are from the United States and Canada, but we do have members from forty-four countries around the world. These are people who are working to provide a safe food supply and to protect the environment in their part of our global community - just like our North American members.

Dr. Bob Brackett, University of Georgia, in a recent letter to IAMFES, expressed concern about the developing countries. To quote a part of Dr. Brackett's letter:

"Developing countries are the ones with the greatest need for information and activities of IAMFES. Unfortunately, the often limited financial resources of the scientists and sanitarians living in these countries also discourages membership . . . We, in IAMFES, could do much to improve the health and sanitary standards of developing countries. However, the sanitarians living in these countries need to have easy access to IAMFES and its publications."

Friends and neighbors in my community are usually willing to help when there is a need. In order to help our neighbors in this global community, we must first know what is needed by our members and other professionals outside North America. We must then hear from the members and potential IAMFES members. I would like to hear from the members and potential IAMFES members on what you think IAMFES' international role should be. If you are from outside North America, I would also like to know what needs you have that IAMFES can help meet. We may not be able to do everything for everyone, but we will take a serious look at what can be done. My address is:

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Dairy, Food and Environmental Sanitation

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The 3-A Story

Thomas M. Gilmore, Ph.D.
Secretary, 3-A Sanitary Standards Committee
Dairy and Food Industries Supply Association
6245 Executive Boulevard, Rockville, MD 20852

The 3-A story is one of a voluntary approach to safeguarding public health and product safety through a unique industry-regulatory program of sanitary standards for equipment used in processing dairy foods and egg products. The 3-A Program is over 50 years old. The program is largely a dairy one, but the egg industry has adapted numerous 3-A Sanitary Standards and 3-A accepted practices for their use. This is so called the E-3-A Program. Other food groups are exploring or are already using 3-A Standards. Foreign, as well as domestic, dairy and food equipment manufacturers are requesting more and more information on the 3-A Program.

Much American made dairy equipment bears the 3-A Symbol, and most U.S. dairy personnel are familiar with the Symbol. However, many do not understand its significance or how standards are developed and applied. This is especially true for those workers new to the dairy industry.

In the early years of the 20th century, differences concerning dairy processing techniques were frequent. States had conflicting sanitary codes and sanitarians from different regions often applied different criteria during inspections. Equipment literally had to be custom fabricated to meet each state's or local area's regulations. The dairy industry recognized the need to rectify a near crisis situation in dairy sanitation.

In the 1920's, representatives from the International Association of Milk Dealers (now Milk Industry Foundation, MIF), and the Dairy and Ice Cream Machinery and Suppliers' Association (now Dairy and Food Industry Supply Association, DFISA) worked together with regulatory agents to define the problem and to formulate dairy standards. The regulatory agents were representatives of the International Association of Dairy and Milk Inspectors (now International Association of Milk, Food and Environmental Sanitarians, IAMFES). These standards became known as 3-A for the three associations involved, and the name has remained unchanged even though the composition of the committees has changed somewhat. The first standards were published in 1929. They specified interchangeability of fittings for milk pipelines. Sanitation was considered, but was not the central reason for their development.

The idea of standards for cleanability of processing equipment gained momentum in the 1930's. When the Dairy Industry Committee (DIC) was formed in 1944, this concept was well on its way to acceptance. Also in 1944, the then Surgeon General of the United States Public Health Service (USPHS) committed that organization to

work with the other three associations in developing and promulgating sanitary standards for use in the dairy industry.

The first equipment bearing the 3-A Symbol was exhibited at the 1954 Dairy Industry Exposition in Atlantic City. Today there are over 50 3-A Sanitary Standards and Accepted Practices, and a few E-3-A Sanitary Standards and Accepted Practices. Standards and practices are constantly being developed, revised or amended by the 3-A Sanitary Standards Committees. At the moment there are over two dozen standards and practices under active consideration. There is also Steering Committee approval to begin the review process on another dozen.

Voluntary Cooperation

It is fundamental in discussing 3-A Sanitary Standards and 3-A Accepted Practices to bear in mind that they are formulated through collaboration - by the manufacturers of dairy processing and handling equipment, the users of that equipment and by sanitarians.

Another point to be made is that no company is compelled to design its equipment to 3-A Standards. The standards are voluntary in nature, imposed by no laws or outside controls. Concern for the public interest, professional pride and legitimate self interest are the motivating forces which have resulted in near unanimous acceptance of the 3-A criteria by equipment makers, equipment users, sanitarians, and enforcement officers in the health field.

What Are The Differences?

3-A Sanitary Standards cover a single piece of equipment, while 3-A Accepted Practices relate to a processing system. Equipment complying to existing 3-A Accepted Practices do not receive the symbol. However, any equipment used in a processing system covered by 3-A Accepted Practices must conform to the appropriate 3-A Sanitary Standards. For example, there are 3-A Sanitary Standards for Plate Heat Exchangers and 3-A Accepted Practices for High Temperature-Short Time Pasteurizers Systems.

Goals

The ultimate goal of the 3-A Sanitary Standards Program is to protect dairy products from contamination and to insure all product contact surfaces can be cleaned-in-place or can be dismantled easily for manual cleaning

and inspection. To put it another way, the public health protection of surfaces and products involved are the key issues. The standards do not cover such items as cases, refrigerators-freezers, cabinets, building structure or material handling devices that do not contact the product. Also, 3-A Sanitary Standards do not address the operating efficiency, reliability or efficacy of any piece of dairy processing equipment in so far as these factors generally do not affect cleanability or protection of the product.

Elements of a 3-A Sanitary Standard

As mentioned we have well over 50 3-A and E-3-A Sanitary Standards and Accepted Practices. Eighty plus companies hold over 250 authorizations to display the 3-A Symbol on various pieces of equipment. Lets next look briefly at the anatomy of standards (the same major areas of concern apply to a practice). Each standard consists of at least six areas.

1. Scope. After the title one finds the scope of the standards. A finite scope is important because it covers, in terms of the piece of equipment, where the standards begin and end. It is a statement of intent, such as "These standards cover the sanitary aspects of devices used on liquid milk products equipment for sensing pressure and/or product level."
2. Definition of Terms. It is customary, following the scope, to define the products that will contact equipment product contact surfaces, the non-product contact surfaces (usually exterior surfaces) and any terms specific to the equipment covered by the standard, as well as the equipment itself.
3. Permitted Materials. The description of permitted materials follows and considers the self-limiting characteristics of the materials which compose the equipment. Sanitary specifications should spell this out with the ultimate criterion being based on the environment of its intended use. The standard bearer for materials used as product contact surfaces is the 300 series stainless steel and their cast counterparts. Exceptions are sometimes permitted for essential functional reasons. Dairy or Waukesha metal is allowed where stainless steel may gall, 400 series stainless steel may be used for flow meter rotors, and most notably rubber and rubber-like materials and plastic materials are permitted for specific applications. Rubber and plastic materials are covered by their own 3-A Sanitary Standards, and must conform to them when used in specified applications.
4. Fabrication of the Equipment. Details of fabrication of the equipment considers sanitary design as effected by the manufacturing or fabrication process. Depending on the piece of equipment covered, most standards contain specifications for the smoothness of finish and welds on product contact surfaces; limitations on the radii of internal angles and requirements of self-draining characteristics; criteria for maintaining the integrity of product contact surfaces and non-product contact surfaces; and guidelines for clearance of the equipment from the floor and walls. In addition there are requirements on accessibility for manual cleaning and inspection, as well as, on the design for

mechanical cleaning. This section is literally the "nuts and bolts" for the construction of the equipment to meet sanitary criteria.

5. Appendix. The appendix is an advisory section of the standards that always includes references to stainless steel materials and product contact surface finish, plus information unique to the construction and installation of the equipment covered by the standards. This section contains information on the applicable composition ranges of stainless steel, welding, finish, etc., which may have been referenced in earlier sections of the standard.
6. Effective Date. The effective date of the standard is one year after final approval by the four groups represented on the 3-A Committees (DFISA, DIC, IAMFES, and USPHS) for equipment, and four months for amendments to 3-A Sanitary Standards for Plastic Materials.

Today the 3-A Sanitary Standards Committees consists of representation from the International Association of Milk, Food and Environmental Sanitarians, the United States Public Health Service, and the Dairy Industry Committee. The DIC, as it is commonly known, consists of five dairy processor organizations and one representing dairy equipment manufacturers. The five include: The American Butter Institute, the American Dairy Products Institute, the International Ice Cream Association, the Milk Industry Foundation, and the National Cheese Institute. A sixth group of 42 task committees is organized under the DFISA Technical Committee. They represent the manufacturers of dairy handling and processing equipment. DFISA also acts as secretariat for all the 3-A Sanitary Standards Committees.

Development of 3-A Sanitary Standards and 3-A Accepted Practices

Each of the standards or practices are developed through a uniform and detailed review of written proposals by the 3-A Sanitary Standards Committee. The basic procedure for writing and gaining approval of standards and practices is as follows.

1. 3-A Steering Committee. The 3-A Steering Committee receives requests for new standards or practices and amendments, revisions, in writing, which are usually channelled through the 3-A Secretary. Requests are submitted to the seven person 3-A Steering Committee which determines the priority and scheduling of the proposals. The purpose of this review is to assure that the 3-A Committees take first things first and maintain a relative priority system. The Steering Committee is made up of two members representing fabricators, users, and sanitarians, and one university faculty member representing the 3-A Symbol Council. The 3-A Secretary organizes Steering Committee meetings. These are usually conducted annually.
2. Task Committee. After consideration of the proposed subject matter for standards or practices, the Steering Committee requests the chairman of the DFISA

The 3-A Symbol Council

The 3-A Symbol was developed by the International Association of Milk, Food and Environmental Sanitarians (IAMFES) and registered with the U.S. Patent Office in 1952. In 1956 the 3-A Sanitary Standards Symbol Administrative Council was formed as a separate entity, completely distinct from the 3-A Sanitary Standards Committees. The 3-A Symbol was transferred by IAMFES to the 3-A Symbol Council upon its formation.

The 3-A Symbol Council consists of eight people - four from IAMFES, and two each from the Dairy Industry Committee (DIC) and the Dairy and Food Industries Supply Association (DFISA). These eight people, known as Symbol Trustees, authorize manufacturers to display the 3-A Symbol on dairy processing equipment that is in compliance with 3-A Sanitary Standards, and to use the 3-A Symbol in product literature. They are also charged with reviewing any possible abuses of 3-A Symbol use. The Symbol Council is administered by Secretary-Treasurer Robert Wolf, with offices in Waukesha, WI. All members of the Symbol Council are volunteers - none receive any reimbursement for council activities.

To receive authorization to display the 3-A Symbol, the manufacturer, through a company executive, certifies the equipment complies with all paragraphs of the applicable standards by doing the following:

1. Signing the printed declarations on the application;
2. Initialing every paragraph of pertinent 3-A Sanitary Standards;
3. Submitting a statement regarding the control systems used, and;
4. Submitting descriptive literature, photographs and engineering drawings if requested;
5. The Symbol Council may additionally request submission of small parts for review or reserve the right to arrange for review of prototype equipment (normally not done).

The application is reviewed by the Symbol Council, and, if all areas are in compliance under the specified standard, the manufacturer is then permitted to use the 3-A Symbol.

As noted there is usually not a formal review of the equipment for compliance with 3-A Sanitary Standards.

Technical Committee to assign the subject matter to an appropriate DFISA Task Committee, representing the equipment manufacturers, or to appoint a new Task Committee if one does not exist. An organizational meeting is scheduled and a first draft of tentative standards or practices is prepared. If there appears that there may be difficulties in the concept under consideration, a subcommittee may initially be used, or guidance may be sought through other segments of the 3-A Committees, including the users, sanitarians or the USPHS. The rough draft of tentative standards or practices is reproduced by the 3-A Secretary and distributed to the full Task Committee for comments. A new revision of the tentative standards may be prepared on the basis of comments received from the

The self-compliance system generally works well - but it does depend on the cooperation of all three segments of the industry. They must be continually vigilant in reviewing equipment for compliance with 3-A Standards. It is also very important to head off trouble by making sure equipment is in compliance at or preferably before its installation. If a possible discrepancy is found, written notification should be sent to Robert Wolf, Secretary-Treasurer, of the 3-A Symbol Council. There are also non-compliance forms available.

Upon receipt of a complaint, the Secretary-Treasurer of the Symbol Council will notify the manufacturer and act as mediator to resolve the problem. If the Secretary-Treasurer and manufacturer cannot resolve the problem the manufacturer has the right to appeal it to the complete Symbol Council which meets twice per year in May and October. It should be emphasized that manufacturers participating in this program do so because they want equipment to conform. Generally in instances of non-compliance, the problems have been successfully resolved without revocation of the 3-A Symbol Authorization.

Twice per year in February and August, the names of 3-A Symbol Authorization holders are compiled by the Symbol Council and published in Dairy, Food and Environmental Sanitation magazine. The list provides a ready reference to equipment carrying the 3-A Symbol. Another way to check for 3-A Authorization is to request that a company provide a copy of their authorization certificate. Reprints of the symbol holders list as well as all 3-A Sanitary Standards and Accepted Practices are available.

Annually the Symbol Council renews authorization for a manufacturer to use the symbol. The Symbol Council Secretary/Treasurer mails renewal notices to the manufacturers two weeks before the authorization expiration date. A thirty day extension is automatically granted. Sixty days later, a letter is mailed notifying the manufacturer that authorization is being dropped. This period may be extended under certain circumstances. The Symbol Council has no punitive power for non-compliance other than the revocation of authorization to use the protected 3-A Symbol.

Further information on the 3-A Sanitary Standards Symbol Administrative Council may be obtained from Robert Wolf, Secretary-Treasurer, W255 N477 Grandview Blvd., Waukesha, WI 53188, (414) 542-0200.

Task Committee or the Task Committee may have to meet again to resolve differences. Eventually, a draft is released to the user group for review at a meeting of the 3-A Sanitary Standards Committees. This meeting is held each May, and a second meeting is held in November.

3. **SSS-DIC.** The SSS-DIC is a body of approximately 40 members representing various segments of the dairy processor or user group. After the Task Committee prepares a draft of a standard or practice, acceptance by the user group is sought. It may take several revisions of the draft to accomplish SSS-DIC acceptance. The first review by SSS-DIC is done in an open forum at a meeting of the 3-A Sanitary Standards Committees. Subsequent reviews by the SSS-

DIC and the task committee may be done by mail unless there are particularly difficult problems to resolve, then there may have to be additional joint meetings of these two groups.

4. Sanitarians. USPHS and the Committee on Sanitary Procedures (CSP) of IAMFES will review the tentative standards after the user group has accepted them. The sanitarian group is made up of numerous members representing local, state, and federal regulatory bodies. The sanitarians meet in a closed session during a meeting of the 3-A Sanitary Standards Committees. They issue unified comments on the tentative standards. The review process is then repeated by the Task Committee and the SSS-DIC, and may involve several more revisions before sanitarian acceptance is forthcoming. When this is eventually achieved, the tentative standards must go back to the user group for ratification of any alterations made. Depending on the magnitude of the differences, they may be resolved in a joint meeting of all 3-A segments or it may be done via mail at a later date.
5. Approval of 3-A Sanitary Standards and Accepted Practices. Once all the groups have ratified any changes, the standard or practice must clear one final hurdle. The final step in the review process is done again at a joint 3-A session, with ratification by all groups involved. At this point, a unanimous decision is sought. When the standard or practice has been ratified, it is then sent to the Chairmen of the SSS-DIC, Technical Committee of DFISA and CSP of IAMFES, and the Chief of Milk Safety Branch of the USPHS for their signatures of approval. New standards are published at least 90 days prior to their effective date in Dairy, Food and Environmental Sanitation. Upon the effective date, the 3-A Symbol Council is prepared to entertain applications for authorization to use the protected 3-A Symbol on equipment that is certified to be in compliance.

In theory the concept seems simple, but in actual practice the development of these standards is intricate, difficult, and at times painstaking work. Many thousands of man hours are required to develop 3-A Sanitary Standards.

Future of 3-A

What is in the future for the 3-A Program? New technology will mandate that new standards or revisions of existing ones be developed. Acceptable finishes and materials may well need re-defining. New 3-A Accepted Practices will be established for new processing systems. Whey processing equipment, membrane filtration, fittings, and aseptic processing are examples.

Outbreaks of foodborne diseases raise the possibility that a counterpart to 3-A could be formed for other food equipment groups. Tapping its resources of manpower and expertise in voluntary compliance, 3-A offers a logical mechanism for applying the same or similar criterion to other types of food processing equipment. The E-3-A Program has already been cited; the alcohol beverage industries use some 3-A equipment as does the pharmaceutical industry and the chemical industry. Equipment used for processing meat, fish, other beverages and frozen

foods could potentially benefit from uniform guidelines for cleanability for product contact surfaces. Regardless of who controls the food of the future, be it food plants as we know them, chemical plants or petroleum by-products plants, the need for stringent cleanability and product protection criteria will be essential. 3-A was a good idea 50 years ago - it is a good idea today - it will continue to serve the dairy and possibly other food industries in the future. Our common goal will always be to get the product from raw material to finished product in the most sanitary and healthful manner possible.

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Basic Equipment Design Criteria

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Chairman, IAMFES Committee on Sanitary Procedures

Any equipment design criteria, standard, regulation or practice must have built into it certain features commensurate with the level of technology of the industry to which it relates. But as technology advances, it becomes increasingly important to maintain the highest possible standards for the sanitary design of equipment which comes in contact with food or dairy products. As we continue to move into an era of technological development and proficiency un contemplated a few years ago, we find that more and more public health and food safety are dependent upon sanitation. We have learned over the years that the optimum in esthetic and technological features helps motivate better care and operation of equipment by the operator.

The quality of sanitation in food and dairy processing plants is also enhanced by a "zero defects" philosophy. It must be remembered that 98% clean is 2% dirty. The elimination of this 2% is the goal of the 3-A Program of Sanitary Standards and Accepted Practices. The 3-A Program seeks to insure that dairy processing equipment is designed to be easily cleanable, and not just 98% clean. By setting design requirements that eliminate the areas that may harbor bacteria or may cause milk and milk products to be contaminated, the 3-A Sanitary Standards promote dairy processing equipment that can be cleaned and sanitized 100%.

Two basic definitions upon which all 3-A Standards are based are:

1. Product Contact Surface: Shall mean all surfaces that are exposed to the product or from which liquid may drain, drop, or be drawn into the product; and,
2. Non-Product Contact Surface: Shall mean all other exposed surfaces.

Product Contact Surfaces

The main thrust of most standards deals with the Product Contact Surfaces of dairy processing equipment. They specify that product contact surfaces must be made of corrosion-resistant, non-absorbent and non-toxic materials, must be smooth, non-porous and free of imperfections, and must have internal angles at junctions and in gasket grooves to allow them to be self draining. There can be no threads on product contact surfaces. Further, product contact surfaces must be visible for inspection when assembled or be readily disassembled for inspection. And they must be readily accessible for disassembly and manual cleaning or be shown to be effectively cleaned by mechanical cleaning.

Materials Used in Equipment

A typical 3-A Sanitary Standard will contain the following specifications in the section titled Materials, C.1: "All product contact surfaces shall be of stainless steel of the AISI 300 Series¹ or corresponding ACI² types (see Appendix, Section E), or equally corrosion-resistant metal that is non-toxic and non-absorbent . . ." In the Appendix E under the heading "Stainless Steel Materials" it states, "Stainless steel conforming to the applicable composition ranges established by AISI¹ for wrought products, or by ACI² for cast products, should be considered in compliance with the 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 steels 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."

Depending on the equipment covered, other materials may be deemed acceptable for specified applications. These include Rubber and Rubber-Like Materials, which must comply with 3-A Sanitary Standards for Multiple-Use Rubber and Rubber-Like Materials (#18-00); Plastic Materials, which must comply with 3-A Sanitary Standards for Multiple-Use Plastic Materials (#20-15); Bonded Rubber and Rubber-Like and Bonded Plastic Materials, which must be of such compositions as to retain their surface and conformation characteristics when exposed to conditions of intended use and in cleaning and bactericidal treatment. Other acceptable materials that may be used in specified applications include: Glass, which must be clear and heat resistant; solder, which shall be silver solder, corrosion resistant, free of cadmium, lead and antimony, non-absorbent and shall not import any toxic substance to the product; Optional Metal Alloy, which must have this maximum and minimum composition (zinc - 8% maximum, Nickel - 19.5% minimum, Tin - 3.5% minimum, Lead - 5% maximum, Iron - 1.5% maximum and Copper - the balance); and Electroless Nickel Alloy Engineering Plating, which must have a composition of Nickel - 90% minimum, Phosphorus - 6% minimum and 10% maximum as a supersaturated solution of nickel phosphide in nickel with trace amounts of carbon, oxygen, hydrogen and nitrogen, and no other elements, to be deemed in compliance.

Design Criteria and Fabrication

A typical 3-A Sanitary Standard will contain the following specifications in the section titled Fabrication D.1: "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 F)." In the Appendix F under the heading "Product Contact Surface Finish" it states "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."

Other areas normally covered in the Fabrication section include fittings and connections, permanent joints, gaskets and radii of internal angles and welds. Fittings and connections are required to conform to the 3-A Sanitary Standards for Instrument Fittings and Connections, No. 09-07, and/or to applicable provisions in the 3-A Accepted Practices for Permanently Installed Sanitary Product-Pipelines, No. 605-02, and 3-A Sanitary Standards for Fittings No. 08-17, revised (as amended). Permanent joints in metallic product contact surfaces must be continuously welded, at least as smooth as a No. 4 finish on stainless steel sheets, and be free of imperfections. Gaskets having product contact surfaces must be removable or bonded and gasket retaining grooves in product contact surfaces shall not exceed 1/4 inch in depth or be less than 1/4 inch wide. An exception is made for standard O-Rings smaller than 1/4 inch. All internal angles on product contact surfaces 135 degrees or less must have radii of not less than 1/4 inch except where smaller radii are required for essential functional reasons. In no case may such radii be less than 1/32 inch. The minimum radii for fillets of welds in product contact surfaces must not be less than 1/4 inch, except that radii may be 1/8 inch when the thickness of one or both parts joined is less than 3/16 inch.

Specific standards also set forth requirements for numerous other equipment parts and components. They cover both product and non-product contact surfaces. A few examples are:

Coil Springs - require a minimum 3/32 inch opening between coil and end when in free position.

Agitator Driving Mechanisms - must have a minimum distance of 4 inches measured from the driving mechanism, excluding bearing and mounting bosses, to the nearest surface of equipment.

Agitator Shaft Openings - must be flanged upward 3/8 inch and have a minimum opening of 1 inch and have a shield provided to protect opening clearance between shaft and equipment. The agitator shaft and openings must be cleanable when fixed or removed.

Manholes - must have an inside dimension of not less than 15 inches by 20 inches if oval or 18 inches in

diameter if round. The upper edge of a top-entering manhole opening shall not be less than 3/8 inch higher than the surrounding area.

Sight and Light Openings - the inner surface must drain inwardly, the exterior flare must not accumulate liquid, and the diameter of the openings must not be less than 3 3/4 inches.

Legs - must be rounded and without exposed threads. The minimum clearance provided between the equipment base and floor must be 4 inches.

Non-Product Contact Surfaces

Even equipment surfaces that do not come into direct contact with the product must be designed so as to be easily cleanable and to not harbor bacteria or other contaminants. A typical 3-A Sanitary Standard will provide that, "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."

It also requires that, "Non-Product Contact Surfaces shall be smooth, free of pockets and crevices and be readily cleanable and those to be coated shall be effectively prepared for coating."

Conclusion

The 3-A Sanitary Standards and Accepted Practices, by adhering to these basic equipment design criteria, offers dairy processors a program to help insure the wholesomeness of dairy products. The cooperation of equipment manufacturers, regulatory sanitarians and dairy processors under the 3-A program allows sanitation to keep pace with technology in processing equipment. By maintaining the highest standards for materials, design and fabrication of equipment, the 3-A Sanitary Standards promote "zero defects" sanitation in processing plants, greatly advancing the ultimate goal of food safety and public health.

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1. AIISI Steel Products Manual, Stainless and Heat Resisting Steels. December 1974, Table 2-1, pp. 18-19. American Iron and Steel Institute, 1000 16th St., NW, Washington, DC 20036.
2. Steel Founder's Society of America, Cast Metal Federation Bldg., 455 State St., Des Plaines, IL 60016.
3. American Society for Testing of Materials, 1916 Race St., Philadelphia, PA 19103.

Unique 3-A Program Beneficial to Processors

by

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The Dairy and Food Processors consider the 3-A Sanitary Standards Program to be unique. Not because it sets out criteria for the material, fabrication and design of dairy processing equipment, or that it provides specifications for the construction of equipment to assure efficient and effective cleaning and sanitizing may be achieved. The 3-A Sanitary Standards are unique because it may be the only *voluntary* program in which equipment manufacturers, regulatory groups and equipment users all have an equal say in the setting of the Standards. In fact, the name "3-A" stems from the cooperative effort of these three industry segments.

The first 3-A Sanitary Standards were formulated over 60 years ago in an effort to develop uniformity in the sanitary design of dairy processing equipment. This was in response to a growing disparity in regulatory inspection codes between different states and even different localities within a state. Representatives from the three industry segments worked to develop standards for the cleanability of dairy processing equipment for their mutual benefit.

Today the 3-A Sanitary Standards Committees are still comprised of representatives from equipment manufacturers, sanitarians and equipment users. Dairy equipment manufacturers are represented by the Dairy and Food Industry Supply Association's (DFISA) Technical Committee, the sanitarians are represented by the International Association of Milk, Food and Environmental Sanitarians' (IAMFES) Committee on Sanitary Procedures (CSP) and the United States Public Health Service (USPHS) and the Dairy Industry Committee's (DIC) Sanitary Standards Subcommittee (SSS) represents the equipment users.

The Dairy Industry Committee, commonly known as the User Group, is made up of six dairy processor organizations and representatives of DFISA. The dairy processor organizations are the American Butter Institute, American Dairy Products Institute, International Ice Cream Association, Milk Industry Foundation, National Cheese Institute, and the National Milk Producers Federation. Approximately 25 different companies are represented through these organizations.

Currently, the User Group consists of 35 people, mostly engineering and quality control personnel. However, there is no fixed number of members for the SSS-DIC. The most important criteria for members are: to be able to actively participate in 3-A Sanitary Standards meetings, to have time to periodically review tentative standards and practices, and to have a general knowledge of sanitary design of equipment.

The SSS-DIC members' expertise in sanitary design is put to use in the early stages of a 3-A Sanitary Standard's formulation. After an initial draft standard has been approved by its appointed DFISA Task Committee, it is mailed to each member of the SSS-DIC. At the next scheduled meeting of the 3-A Committees, the Task Committee Chairperson presents the draft to the SSS-DIC. At this meeting the SSS-DIC may accept the draft as presented or provide comments for further revisions by the Task Committee. Revisions of the draft are made until SSS-DIC acceptance is achieved.

In their consideration of a draft standard, the Users Group's primary concerns are the cleanability and

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cost of the dairy processing equipment. They want to ensure that a 3-A Sanitary Standard specifies the most effective sanitary design possible, so that the equipment, when properly operated and sanitized, will comply with all applicable sanitary codes. This goal is pursued, while keeping in mind the equipment must be cost competitive in operation and cleanability. Equipment of sanitary design is beneficial only when costs do not prohibit its use.

Benefits of 3-A Program for Processors

In formulating a 3-A Sanitary Standard, the SSS-DIC (Users) group, as well as the manufacturers and sanitarians, strive to create a Standard for equipment that is both economical to fabricate and readily cleanable. The achievement of this benefits all three segments of the industry. The 3-A Program also provides other assets for the dairy processor community.

When a dairy processor uses equipment bearing the 3-A Symbol, he can be assured that:

1. The equipment and components will be approved by most State and Federal Regulatory Agencies, and be in compliance with applicable sanitary codes.
2. The sanitary design of the equipment allows him to apply the most modern cleaning and sanitizing methods, materials, and systems to his in-plant operations. His equipment can be cleaned satisfactorily.
3. The easy and efficient manner in which the equipment may be cleaned results in lower cleaning costs, especially in labor.
4. Regulatory inspections will present fewer problems when equipment and sanitation practices comply with the 3-A Sanitary Standards.

The dairy processor community also reaps less tangible benefits from the 3-A Program. The User Group learns to appreciate the problems and restraints facing the equipment manufacturers. They are better able to recognize the concerns for sanitation of regulatory personnel. But, most important of all, the User Group gets to know the people in the industry on a first name basis. They are able to exchange ideas and interests with manufacturers and sanitarians, as well as other processors.

The exchange of ideas and information between dairy processors, equipment manufacturers, and regulatory sanitarians is what the 3-A Sanitary Standards Program is all about. Through their cooperative efforts, dairy processing equipment is designed to be cleaned and sanitized efficiently and to not contaminate the product when in operation. This cooperation for mutual benefit, is further enhanced by the voluntary nature of the 3-A Program.

Dairy processors, through their participation in the 3-A Program, can be assured that their future needs will be met with "state of the art" equipment bearing the 3-A Symbol.

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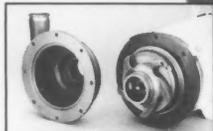
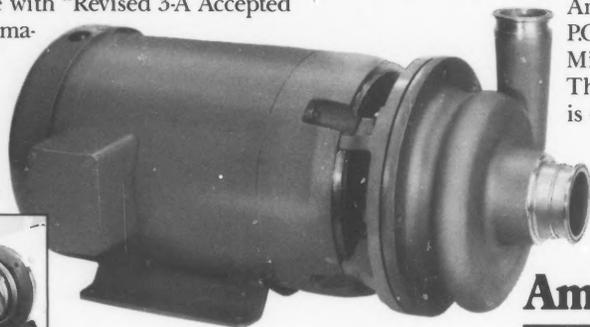
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3-A Sanitary Standards Their Value to the Equipment Manufacturer

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The 3-A Sanitary Standards Program benefits many people including the general public who consume dairy products, the operators of dairy plants, sanitarians who inspect dairy plants, and the people who manufacture the equipment used to process dairy products. The program impacts all of these groups in a positive way, but its effect on the latter group will be the focus of this article.

First, the program offers the equipment manufacturer the opportunity to take an active role in the formulation of any standard which affects his product. In fact, manufacturers are encouraged to participate in the work of relevant task committees. Generally, task committees are comprised of representatives of companies which manufacture equipment. The task committees write the initial drafts of proposed new standards, as well as drafts of revisions to existing standards. After developing an acceptable draft, the task committee members remain active participants in the progress of the standard through acceptance by the user group and the sanitarian committees to final approval and signing. This procedure provides manufacturers the opportunity to see that the standard is properly written and does not contain unnecessarily restrictive wording which might adversely affect their designs.

Secondly, the flexibility of the program allows for changes to be made to existing standards. An equipment manufacturer may request a revision to a standard by writing to 3-A Sanitary Standards Committees at 6245 Executive Blvd., Rockville, MD 20852. The request will be presented to the Steering Committee, and if accepted, the appropriate task committee will be directed to prepare a draft. The draft will then proceed through normal channels for approval. This ability to request and help implement changes to existing standards enables equipment manufacturers to initiate changes which permit them to offer new and improved features in their products.

Third, each standard covers only one specific type of equipment. It details the sanitary aspects of material se-

lection, design and fabrication for that type of equipment only. Being specific, it leaves little room for question in the equipment designers mind, and therefore, his task is made easier. Furthermore it is quite likely that the design and construction will be acceptable to users and sanitarians almost universally.

This was not always so. In the years before the existence of 3-A Sanitary Standards and before more uniform local sanitary regulations, it was common for interpretations of sanitary design criteria to vary greatly from state to state or even from county to county. For example, a few areas required product contact surfaces to be finished to a #7 finish, while other nearby localities required a #4 finish. Similar inconsistencies existed in requirements for minimum radii, gasket grooves, seal designs and material selection. All of this created costs which were higher than necessary and extended delivery times. The 3-A Sanitary Standards have gone a long way toward improving this situation.

A manufacturer whose equipment complies with all of the criteria in a standard may apply for authorization to use a 3-A Symbol on that equipment and in literature describing the equipment by writing to the 3-A Sanitary Standards Symbol Administrative Council. He will be provided with application forms and detailed instructions.

Basically the program is one of self certification. The Symbol Council does not certify, accept or approve any equipment as such. It merely issues a certificate which authorizes the manufacturer to display the 3-A Symbol on that specific equipment for a period of one year from the date of issue. At the end of each authorization period, the manufacturer must apply for renewal, reaffirming that his equipment complies with the current standard, and by paying a small renewal fee.

For the equipment manufacturer, authorization to display the 3-A Symbol is an important privilege, for it signifies to his customers and to regulatory authorities that his equipment is designed and built to exacting sanitary criteria.

*Mr. Laun is recently retired from Cherry-Burrell Corp.

“The 3-A Symbol” What Does It Mean To The Sanitarian?

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Just what does it mean when a dairy sanitarian sees the 3-A symbol on a piece of dairy equipment?

The first thing that can be assured is that the equipment has been designed and manufactured to a precise set of standards. The equipment manufacturer has certified that their equipment meets the Standard when they applied for and were granted the authorization to use the 3-A Symbol.

The equipment will be manufactured from materials that will withstand the rigors of the environment and the cleaning and sanitizing chemicals used for its cleaning. It will be constructed to specific criteria regarding proper radii in the corners so that it will be easier to clean and sanitize. There will be no exposed threads in the product zone, and there will be no cracks or crevices that might collect material to harbor food for bacterial growth. The equipment will be constructed so that it can be easily disassembled to determine if it has been properly cleaned. The sanitarian can be assured that the equipment will meet the equipment construction criteria of the dairy sanitation regulations under which they are operating.

They will know that the Standard was developed by some of the most dedicated and knowledgeable of their peers. That it has been reviewed by the user's of that type of equipment and that they have endorsed it. The manufacturers of similar types of equipment have had an opportunity to review the Standard and have their views known and considered.

Another aspect of the 3-A Standard program that we should look at is “what does a 3-A Symbol not mean.”

First off, the presence of the symbol does not mean that the equipment will always clean in place, even though the salesperson who sold it said it would. We all should know that cleaning by circulating cleaning solution on and over the product contact surfaces is common practice in most all modern dairy plants. We also should realize that the effectiveness of this type of cleaning is a function of time, temperature, concentration of cleaning compounds and flow rates of the cleaning solution.

All dairy equipment that has seals, rotating shafts or other moving parts will have areas around these parts that will be difficult to clean by circulation cleaning methods. This is where the easy disassembly will come in handy when they wish to check on the proper cleaning.

Although the equipment does bear the 3-A symbol, the sanitarian should check each new piece of equipment to make sure that it does conform to the Standard. The manufacturer may have inadvertently missed something in the fabrication. Maybe there are some parts that have not been polished to the required finish. Whenever a sanitarian finds a piece of equipment that does have the 3-A symbol on it and they feel that it does not meet the Standard, they should contact the 3-A Symbol Council. The Symbol Council will make a full investigation and report to the sanitarian who filed the complaint.

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AFFI Applauds Bush's Food Safety Policy

The American Frozen Food Institute (AFFI) has expressed its appreciation to President Bush for proposing a food safety policy that addressed several issues important to the AFFI membership.

The proposal was developed shortly after AFFI contacted President Bush in October to call his attention to the deterioration in consumer confidence, and to encourage formulation of a food safety policy as it relates to pesticides.

In comments to the President, AFFI credited the policy because it takes into account a pesticide's benefits as well as the health risks involved in its use. Previous proposals have neglected to include this risk-benefit analysis.

"By virtue of the sheer percentage of AFFI members' contribution to this nation's food supply, surely you can appreciate our extreme interest in having the federal agencies responsible for safeguarding the food supply in an effective and efficient manner," stated Steven C. Anderson, AFFI president, in the comments.

The proposal also gives regard to the affect on the cost and supply of food and the economic impact on producers in setting pesticide tolerance levels.

"AFFI applauds this progressive and reasoned approach," stated Anderson. "Another aspect of the pesticide issue which we consider extremely important is national uniformity in tolerance levels, and this is included in Bush's proposal. The possibility of fifty different pesticide residue tolerance levels sends shock waves through the entire food industry."

AFFI will continue to study the comprehensive program with great interest as it moves through the legislative process.

AFFI is the national nonprofit trade association that has represented the interests of the frozen food industry for nearly 50 years.

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

Food & Dairy EXPO '89 Stages Record 546 Exhibits

Food & Dairy EXPO '89, the 40th exposition produced by Dairy and Food Industries Supply Association, Inc. (DFISA), hosted a record 546 exhibitors covering almost 300,000 net sq. ft. of space at Chicago's McCormick Place this November 11-15.

Food & Dairy EXPO '89 attracted more than 18,600 leading food, dairy and beverage processors,

suppliers and industry representatives. Exhibitors were pleased with the high level of professional attendees on this year's show floor.

The strong international interest in Food & Dairy EXPO '89 drew almost 1,600 international attendees and more than 11 delegations of processors from around the globe.

DFISA President Edward Rhawn was most happy with the record number of exhibitors at EXPO. "Our firsts at EXPO the seminars, the show daily, the free buses were all well done and well received by our audience," said Rhawn. "I received nothing but compliments from both processors and exhibitors," he added. "It was truly a quality audience," Rhawn said.

"The first time processor seminar program "Preparing for the '90s", attracted nearly 2000 attendees to sessions covering topics from packaging to engineering. We put the new program on the agenda this year in response to our customer needs, and from what I've heard, the response was extremely positive to all the sessions," said Rhawn. Audio cassettes of the seminar sessions can be ordered from DFISA.

Food & Dairy EXPO has been the leading exposition of its kind since 1919. In 1989, its comprehensive displays presented the newest and most up-to-date products and technology in the fields of food, dairy and liquid food processing equipment, ingredients, packaging, transportation and services.

Food & Dairy EXPO '91 will be held October 26-30, at Chicago's McCormick Place North. To order audio cassettes from seminar sessions or for more information contact: Dairy and Food Industries Supply Association, 6245 Executive Boulevard, Rockville, Maryland 20852. Telephone: 301/984-1444. FAX: 301/881-7832.

Seton's Right-To-Know Training Program: A Three-Part Approach to OSHA Compliance

Seton's Right-To-Know Training Program is a three-part instructional package that helps employers educate employees about the proper ways to handle hazardous materials. Because the Program consists of three components, it provides employers with several ways to reinforce training messages - and ensure compliance with OSHA regulations.

Part 1 consists of booklets that put basic compliance information directly into employee's hands. Written in clear, simple language and cleverly illustrated, these booklets quickly communicate to workers the safe way to deal with potential workplace hazards. Part 2 is a Compliance Encyclopedia - a handy 600-

page reference guide that provides step-by-step instructions detailing the proper way to develop a written program and an overall employee training plan, as well as labeling and MSDS requirements. A one-year subscription to the "Right-To-Know Compliance Advisor" is included. Part 3 is a Right-To-Know training film - a 20-minute visual presentation that shows workers how to read labels and MSDS sheets. The film applies to any manufacturing environment and is available in film or video formats.

The entire Program can be ordered as a kit at savings of over \$100; or the individual components can be ordered separately. In addition, Seton offers a complete line of Right-To-Know Labels and Signs for compliance throughout your facility. For more information or to place an order, please contact Seton Name Plate Company, P.O. Box ZGO-1331, New Haven, CT 06505. For fastest service call toll-free 800-243-6624.

Innovations Expected to Fuel Popularity of \$625 Million Market for Microwaveable Food Packaging

As Americans continue to turn to microwave ovens for quick, convenient cooking, the market for microwaveable food packaging is increasing rapidly. Containers such as bags, paperboard cartons with susceptors, multilayered tubs, polypropylene trays, thermoset PET and CPET now comprise a nearly \$625 million market.

According to a recent study published by FIND/SVP, a leading market research and information-services consulting firm, consumption of containers designed exclusively for microwave ovens will total about 2.15 billion units in 1989, an increase of 616% over 1984's 300 million units, for an estimated average dollar value of \$308.6 million. This figure may hit 6.53 billion units by 1994.

Meanwhile, consumption of dual microwave/conventional-oven food packaging will be about 3.17 billion units, 108% more than the 1.52 billion units consumed in 1984, for an estimated average dollar value of 316.3 million in 1989. By 1994, this number will climb to 5.0 billion units.

Dedicated microwave packaging will overtake dual-ovenable packaging by 1991, provided the availability of special plastics and other materials remains constant, and that any future waste disposal legislation does not restrain production.

As was the case throughout the 1980s, consumers today are most likely to use their microwave ovens to warm up leftovers, cook snacks (including popcorn) and thaw and cook frozen foods. Yet, they still demand a look, taste and feel similar to those cooked in a conventional oven. The challenge to food technologists, packaging suppliers and food processors then, is to produce foods designed for preparation in the microwave that have the characteristics of foods prepared in conventional ovens.

FIND/SVP expects several technological innovations to advance the market's growth. For example, as microwave packaging becomes increasingly capable of allowing microwave ovens to "brown" food, more products like baked goods will convert to exclusively microwaveable packaging rather than dual-ovenable or conventional packaging.

Currently, companies such as DuPont and General Electric are working to develop microwave packaging that allows for browning or crisping of food, as well as the ability to cook foods more evenly, especially multi-component meals.

However, as environmental concerns over waste disposal and pollution continue to mount, producers of microwave packaging will need to minimize the amount of waste in their products as well as increase their output of reusable or recyclable packaging, the study notes. Boil-in-the-bag type packages and multi-purpose microwaveable containers like plastic buckets, that can be used to cook, transport and store dishes are two such methods gaining in popularity.

National Restaurant Association Testifies Before FDA in Opposition to Mandatory Ingredient Labeling

Jim L. Peterson, President and CEO of Whataburger, Inc. and Immediate Past President of the National Restaurant Association, testified against mandatory ingredient labeling for fast food at a field hearing conducted by the Food and Drug Administration (FDA).

"As restaurateurs, we recognize and respect our customers' right to know what ingredients are in the foods they eat," Peterson told the FDA at the San Antonio hearing. "Our concern is not with providing ingredient information; it is with the method used to convey the information."

Peterson cited several ways in which the foodservice industry has voluntarily responded to patrons who seek ingredient or nutrition information, including the use of printed materials, toll-free hotlines or interactive computers. According to a 1988 National Restaurant Association survey of 28 chain operators, fully 86 percent of the respondents provide nutrition information to their customers and 79 percent provide ingredient information.

"Restaurateurs have come a long way over the past several years in responding to patrons who want ingredient or nutrition information," Peterson told regulators. "Most important, the industry has done this in the absence of any government mandate."

Peterson outlined for the FDA previous instances when legislators and regulatory agencies have explored the question of mandatory fast food labeling - only to dismiss the issue. In 1987, the chief Senate sponsor of fast-food labeling legislation, Senator John Chafee (R-RI), decided not to pursue passage of his bill after noting that most large fast-food companies were already providing this information to interested patrons.

Three current food labeling bills circulating in Congress specifically exempt restaurants from labeling requirements, Peterson told the FDA. And in 1979 and again in 1987, both the FDA and the U.S. Department of Agriculture (USDA) rejected proposals to require fast-food labeling, judging the proposals to be impractical and financially burdensome.

"Both FDA and USDA recognizes that, first, fast-food containers are used for multiple purposes," Peterson said. "The same cup, for example may be used to serve soft drinks, a variety of fruit juices, iced tea, coffee, milk, and milk shakes. If the container were required to carry ingredient information, a different cup with different labels would be necessary for each beverage, in every available size, to accurately reflect the ingredients.

"Second, regulators weighed the costs of any labeling requirements, both to businesses and, through higher product costs, to the consumer, against the alleged benefits which a relatively small percentage of the population may or may not use. Based on this cost-benefit analysis, both FDA and USDA were unable to justify fast-food ingredient labeling," Peterson said.

In addition to these arguments, Peterson told regulators, there remain a number of other problems with fast-food labeling: ingredient labels provide "after-the-fact" information - patrons see labels after they purchase the food - and therefore do not assist in purchasing decisions; mandatory labeling may cause unnecessary anxiety among patrons unfamiliar with the technical terms that identify many ingredients; fast-food labeling fails to take into account the complexity of menu items; and, in some circumstances, ingredient labeling could disclose confidential recipes, product formulation or other closely-guarded trade secrets.

"In sum, the National Restaurant Association supports the right of consumers to know the ingredients in the foods they eat," Peterson concluded. "Left free to design the right vehicles for disseminating that information, the industry has demonstrated that it can and will respond to market demand where it arises. Mandatory fast-food ingredient labeling, however, is neither effective nor feasible.

For more information contact Anne Papa, Manager, Media Relations (202) 331-5938 or Jeffrey Prince, Senior Director (202) 331-5935.

Drew Introduces PerforMax™ 412 Cooling Water Treatment - Advanced Phosphate Technology

Inorganic phosphate treatment programs represent a significant portion of the overall corrosion inhibitor market throughout the world. The success of these one-drum, high phosphate programs comes to no surprise, as it allows the customer many advantages which had been a previously unattainable. Some of these advantages include: the feeding of a single

product (which cuts down on the number of feed pumps and equipment costs), and the simplification of inventory by utilizing one product instead of two.

In keeping with the demand for advanced technology as well as convenience, Drew has recently introduced PerforMax™ 412 cooling water treatment, a product which has been designed to provide a complete corrosion inhibitor and deposit control program in a convenient, economical one-drum package. The one-drum treatment package assures that a consistent ratio of corrosion and deposit inhibitors exist in the cooling water system.

Since corrosion protection is provided via phosphate-based anodic and cathodic inhibitors, the environmental impact associated with traditional heavy metal treatments is eliminated.

PerforMax™ 412 cooling water treatment, due to the advanced polymer technology employed, offers greater application flexibility than competitive inorganic phosphate programs. This flexibility applies to pH swings, overcycling and iron contamination levels.

Drew, a division of Ashland Chemical Inc., subsidiary of Ashland Oil, Inc., is a major supplier of services and products for cooling water management and specialty chemicals for the industrial and marine markets.

More details on Drew's cooling water treatment can be obtained by writing or calling Marketing Services Department, Drew Industrial Division, One Drew Plaza, Boonton, NJ 07005, (201) 263-7745.

Food Scientists From Academe and Industry To Lead IIT's National Center for Food Safety and Technology

Illinois Institute of Technology and the U.S. Food and Drug Administration announce the selection of Richard V. Lechowich, a food scientist with 30 years of academic and industrial experience, to head the new National Center for Food Safety and Technology at IIT's Moffett Center in Bedford Park, Ill.

His wife, Isabel Drane Wolf, a food scientist with extensive academic and government experience in nutrition education and research, will serve as communication and marketing director for the center.

Established last year with a \$7-million gift of facilities from CPC International Inc. and a \$3.7-million grant from the FDA, the National Center for Food Safety and Technology is a consortium of industry, academe, and government dedicated to cooperative research in food safety and quality. Besides IIT, IIT Research Institute and University of Illinois are participating in the consortium. Founding industrial members to date are CPC International, Kraft General Foods, Wrigley, FMC, and Pfizer.

Last fall, IIT launched a nationwide search for a

scientist or engineer with the requisite academic and industrial experience to direct the center, according to Darsh T. Wasan, vice president for research and technology at IIT and IIT Research Institute.

"In Dr. Lechowich we have found exactly the qualities we sought. His stature in industry and his experience in academe will ensure that we achieve both our research and educational goals," said Dr. Wasan.

In research, the center will address national food safety issues that are too large and too diverse for any one sector of the food industry to tackle alone, according to FDA Commissioner Frank E. Young, M.D., Ph.D.

"Biotechnology and new processing and packaging techniques are only a few of the innovations underway in the food industry. By facilitating cooperation, research, and information exchange among industry academe, and government, we can take a systematic and interdisciplinary approach to potential nutrition and food-safety issues before they become crises," said Dr. Young.

Dr. Lechowich, 56, earned his Ph.D. in food science from University of Illinois in 1958, after earning bachelor's and master's degrees from the University of Chicago. He has served on the food science faculty of Michigan State University, as chairman of the food science and technology department at Virginia Polytechnic Institute and as manager of microbiology at General Foods Corporation's technical center. In the latter job, he monitored food safety and quality in the production process for various prepared food products.

Since 1987, Dr. Lechowich has served as executive vice president and technical director of ABC Research in Gainesville, Fla., where he worked as a liaison between clients in the food industry and government regulatory agencies, while managing research projects, food analytical services and personnel. Among his many honors and memberships in professional societies, he serves on the executive committee of the Institute of Food Technologists and has served on the committee on food protection of the National Academy of Sciences/National Research Council.

Ms. Wolf earned a bachelor's degree in chemistry from Simmons College and a master's degree in food science and nutrition from University of Minnesota. She taught in the department of food science and nutrition at the latter institution for 10 years, where she developed food science and nutrition education programs for consumers. She moved on to the U.S. Department of Agriculture, where she was named director of the office of consumer advisor. Later, she became administrator of a USDA national food and human nutrition research and information program. Most recently, she served as director of marketing at ABC Research.

For additional information please contact: Frank Lipo/Mary Dawson, IIT Public Relations Office, (312) 567-3104.

Kelvinator Assists Arbuckle Project at MIZZOU

With its gift of equipment, Kelvinator Commercial Division of White Consolidated Industry, Inc. recently made its third donation to the University of Missouri Arbuckle Ice Cream Project.

The hardening cabinet is used to closely control the temperature of frozen desserts being researched. The dipping cabinets are used in Buck's Ice Cream Place, the retail store on MIZZOU's campus.

In 1987 Wendell and Ruth Arbuckle started an Ice Cream Endowment at MU. Industry joined in by donating to the endowment, providing equipment and supplying advice through the Arbuckle Advisory Committee. Baskin-Robbins and Kelvinator are major participants.

The program received its first grant for research in mid-1989 and now has three graduate and two undergraduate students doing research. The program includes classroom teaching, short courses and student experience as well as research. Arbuckle Professor Robert Marshall coordinates the program that is housed in MU's Department of Food Science and Nutrition. Associate Director in charge of retail operations is Professor Dean Shelley.

Economist Addresses Food Safety Role in the 1990 Farm Bill

Whether the issue of food safety is specifically identified in a farm bill or not, the issue is going to keep growing, said a policy specialist here this week.

Dr. Karen Behm, policy specialist with the Louisiana Cooperative Extension Service, said food safety is an old issue that started getting more attention after the Alar incident.

"Since the Alar incident this summer, there have been steady streams of reports relating to food safety and chemicals," she said.

"Most of the response to this has been that pesticides and other chemicals are carefully regulated and are not used unless they have been approved for that purpose," she said.

Behm, who addressed a beef cattle policy symposium, said the involvement of popular movie stars in food safety or animal rights projects has added to the confusion.

She said consumers are going to demand some alternatives for food safety, therefore, it's important to have a good understanding of consumer attitudes to look at food safety and the implications for the 1990 Farm Bill.

Behm said a 1987 survey indicated 80 percent of consumers were concerned about chemicals, and 18 percent of these changed their behavior.

Behm said a Food Marketing Institute survey of consumers revealed that concern about antibiotic and

hormone residues in poultry and livestock products increased from 42 percent in 1985 to 61 percent in 1988.

"It is somewhat problematic that consumer concerns are so different from those expressed by the scientific community," she said.

"Consumers tend to rank their concerns as pesticide residues, antibiotics, food additives and preservatives, coloring agents and irradiation.

"Scientists see the food safety issues as food-borne diseases, malnutrition, environmental contaminants such as lead or mercury, naturally occurring toxins, pesticide residue and deliberate food additives," she said.

This is ironic, Behm said, since the biggest food safety issue according to scientists, food-borne illness, is one where consumers have a fair amount of control.

Researchers estimate that anywhere from 6.5 million to 33 million Americans become ill each year from micro-organisms in their food, Behm said.

Behm said part of the food safety concern may be because the idea of the wholesome family farm is rapidly disappearing. Consumers see agriculture as another big business and this affects their perception of information from commodity groups and associations.

"It's hard for consumers to believe that safety concerns would be more important than economic gains," she said.

Behm said to maintain confidence, it's important that agents and spokespeople deal with issues fairly and don't just become a conduit for a particular industry.

She said it would be a lot easier if the food safety issue was dealt with in one piece of legislation. "Dealing with all of the food safety issues is going to be a lot like picking up mercury. Just as you get a hold of one issue it's going to drop and split into 10 more," she said.

The debate over food safety becomes frustrating when participants are defining the problem differently, Behm said.

"The farm manager looks at controlling environmental concerns from the standpoint of the farmer's production. Environmentalists see the issue from the standpoint of environmental quality," she said.

"Food safety may not be a new issue and it may not even seem to be that controversial," Behm said. "Yet we all want a safe adequate food supply.

"The fact that food safety affects every single person in the country will assure it of remaining a top issue for some time to come," she said.

For more information contact Dr. Karen Behm, (504) 388-4141.

Industry Food Safety Self-Regulation A Meeting of the Minds In Rochester, Minnesota

A critical problem in the food and beverage industry is prevention of foodborne illness. It is estimated that every time a customer gets sick, it costs the

restaurant \$1,500.00. Two health inspections each year and an occasional food safety publication from the health department will not adequately solve the industry's need to provide safe food. In Rochester, Minnesota, one group is seeking solutions on their own.

In November, 1988, concerned restaurant owners and sanitarians from the Rochester area began the Olmsted County Quality Assurance Council. The restaurant owners, with guidance and advice from the Olmsted County Health Department and Dr. Peter Snyder of the Hospitality Institute of Technology and Management (HITM) in St. Paul, set out to solve the problems of providing safe food to county residents.

Because Rochester is a major medical center, it was a reasonable site to begin this industry effort. The restaurant owners felt that it was important to commit themselves and their employees to this focus on health.

The Council, starting with only fifteen restaurants, began to promote communication and education for foodservice employees and owners. Believing that food safety and profits can go hand in hand, their objective was, and is, ZERO DEFECTS and zero foodborne illnesses in the Rochester area through daily application of current knowledge of food safety.

In the early months of the Council, guidelines were set to determine the most important areas of quality control, and to test performance levels. Seven areas were selected to be the foundation of the self-regulation and employee training effort: cooling methods, hand washing, food temperatures reheating procedures, cutting board sanitation, food covering and labeling, and the commitment of the owner to food safety. These areas were charted monthly to determine the amount of progress made in each area. Sanitarians not only inspected, but strove to educate, to explain problems and their causes, and to outline what steps needed to be taken in order to correct them and to avoid future problems. While the charts varied monthly, they indicated no overall improvement of conditions. Education and inspection alone do not bring safety. The owner must become the inspector and enforcer, and must have a self-regulation program.

With this knowledge, the Council now views its major function as acting as a support group for restaurant owners, helping them find solutions to health problems, encouraging food safety efforts, and allowing owners to share their quality control systems with others. For example, one Council member shared a success story that shows how self-regulated quality control saved him money. Because he daily monitored the temperatures of his restaurant's cooling systems, he was able to know when one of his refrigerators was failing, and could repair it before it broke down. He averted the potential loss of thousands of dollars in spoiled foodstuffs and lost customer revenues.

The Council does not plan to limit its concern only to safety, but to address all retail food operating problems, including customer satisfaction. As the Council continues to grow, it will be possible for it to focus on the goals of customer confidence and freedom from the fear of foodborne illness.

Members are now looking more closely at important issues and doing research together for improve-

ments in equipment, regulations and training options. The health department and the Hospitality Institute help the Council by acting as sources of accurate and up-to-date information and education, which are invaluable to the success of any industry self-regulatory effort. For instance, owners realize that government inspections of suppliers do not guarantee the safety of their food supplies. They also feel that if restaurants demand the best and safest quality food from their suppliers, suppliers will comply. With encouragement from the Council they can more confidently question the practices of their suppliers and demand supplier certification.

The Council is also active in efforts to improve food safety education at training schools and vo-tech institutions.

Dr. Snyder is one who has done much to help promote the goals of the Olmsted County Quality Assurance Council. His organization, HITM, helps improve education and support for members. It serves as a neutral facilitator between the government and the food industry. HITM offers training programs and seminars designed for both management and employees. HITM's educational materials include posters, handouts, books, and video resources.

Dr. Snyder feels that the Council's two most important accomplishments during the first year were: 1) forming a government-industry team committed to promoting the objective of zero defects in Rochester area food operations, and 2) the recognition that foodborne illness is a health problem that only industry self-regulation can solve.

People today are more concerned about their health than ever before, and this effects consumer decisions about eating out. Dr. Snyder and the Council plan to adopt a QA symbol suitable for posting to indicate to consumers which restaurants are actively concerned about food safety and maintain a voluntary self-regulation program accepted by the health department. If the public rewards these restaurants by choosing them over others, then the rest of the food industry will implement self-regulation in order to remain competitive. Mandatory government owner certification programs have not been successful because they do not require owner commitment and follow-through. The Olmsted County's voluntary industry program does.

The Council hopes too, that the idea of self-regulation will spread to other cities. While Rochester, more than other places, is already attuned to health issues, everyone should be concerned about the quality of their food. Self-regulation seems to be the only method that has the potential to make headway against the continuing problem.

The new year brings new challenges to the Olmsted County Quality Assurance Council. It is strong enough now to bring ideas to public attention and to encompass more restaurants. Through proposals for more open meetings, better communication with local media, and certification of involved restaurants, the Council is ready to tell the public, "If you eat at our restaurants you will not have to worry about getting sick. We are committed to, and practice, food safety and quality assurance. We have the correct safety knowledge and

employee follow-through 100 percent of the time. We care about your well-being."

New Book Announcement: Health Surveillance and Management Procedures for Food-Handling Personnel Report of a WHO Consultation

This book records the conclusions and recommendations of an international group of experts commissioned to evaluate the effectiveness of current procedures for protecting the public from disease outbreaks caused by food handlers. The report focuses on the question of whether routine medical examinations of food handlers are sufficient to prevent, or at least minimize, food contamination.

To answer this question, the report first examines all infections and intoxications potentially transmissible by food handlers and then considers the extent to which physical examinations, medical histories, throat swabs, blood tests, x-rays, skin tests, and examination of faeces are capable of detecting symptomatic or asymptomatic carriers. Readers are reminded that the information obtained from a health examination is valid only for the time at which it was carried out, that some infections are detectable for periods as short as 48 hours, and that others, such as infectious hepatitis, are contagious before the onset of any clinical symptoms. On the basis of this review, the report concludes that pre-employment and subsequent routine medical examinations of food handlers are ineffective and thus unnecessary.

The remaining sections concentrate on the identification of effective alternative preventative measures. These include the surveillance of outbreaks of foodborne disease, use of the Hazard Analysis Critical Control Point (HACCP) system as a rational and up-to-date method of preventing foodborne diseases, and several measures within the food industry.

While noting that these methods are more cost-effective as well as more reliable than routine medical examinations, the report stresses the need to train large numbers of scientific and technical professionals as well as supervisors, managers, and employees within the food industry. Examples of health cards, material for use in training courses and in health interviews, and a model form for securing the agreement of food handlers to report designated illnesses are presented in separate annexes.

For more information contact World Health Organization Publications, Distribution and Sales, 1211 Geneva 27, Switzerland.

Robert B. Gravani Receives Fellowship To National Center Leadership Program

Robert B. Gravani, Associate Professor of Food Science at the Department of Food Science, Cornell University, has been selected to receive a fellowship for the 1990 National Leadership Development Program for the National Center for Food and Agricultural Policy at Resources for the Future, Washington, D.C.



R. B. Gravani

The Program, which involves four weeks of intense study of the interrelationships between food, agricultural, and related policies and the policy-making process, is designed for mid-level professionals with strong leadership potential and proven experience in agriculture-related occupations. "We are pleased to have Dr. Gravani as a participant in this year's program," says Nancy Bushwick Malloy, Associate for Leadership Development, "and we expect that each fellow will not only learn something about policy formation but contribute substantively to the discussion of new policy directions for American agriculture."

The Leadership Development Program is now in its fifth year of operation and is part of the National Center's commitment toward providing continuing professional development opportunities for the next generation of national leaders in fields related to food, agriculture, and natural resources. The National Center for Food and Agricultural Policy was established in 1984 by Resources for the Future. The National Center's mission is to conduct research, policy analysis, and outreach on emerging policy issues, with particular emphasis on the linkages of U.S. agriculture with environmental quality and natural resources, food safety and quality, and health, with consideration of the international dimensions. Its purpose is to contribute to the public debate on policy issues affecting the food and agricultural system.

Resources for the Future, founded in 1952, is an independent nonprofit organization for research and education in policy issues concerning natural resources.

In addition to food and agricultural policy, it carries out programs on energy and nonfuel materials, environmental quality, and renewable resources.

Robert Gravani is an associate professor of food science at Cornell University. His responsibilities include providing technical assistance and training programs to various facets of the food industry and regulatory agencies. He teaches several courses as well as conducts research on the microbial safety of foods.

Bob received his B.S. in food science from Rutgers University. He earned his M.S. and Ph.D. in food science from Cornell University. He is an active member of the Ithaca Rotary Club. He received the 1989 Norbert F. Sherman Award from the Educational Foundation of the National Restaurant Association. In 1987 and 1988 certificates of appreciation were presented to Bob from the New York State police for conducting training programs on consumer product tampering. He was a visiting scholar at the University of Nebraska in 1987 and a visiting professor at the University of Minnesota in 1986. He is a member of the New York Academy of Science and past president of the International Association of Milk, Food and Environmental Sanitarians.

For more information contact Nancy Bushwick Malloy, (202) 328-5011 or Tamara A. Kloeckl, (202) 328-5117.

Three Dairy Processor Organizations Create International Dairy Foods Association

The three trade associations representing milk and milk products, ice cream, and cheese manufacturers and processors have created an umbrella organization, the International Dairy Foods Association (IDFA).

The Milk Industry Foundation (MIF), International Ice Cream Association (IICA), and National Cheese Institute (NCI) created IDFA to manage the activities of the three associations. Each will retain its autonomy - its own board of directors and its own policies.

"IDFA will benefit the members of all three organizations," said IICA Chairman Ron Rice. "The umbrella organization will streamline the associations' management, allow a more coordinated effort on behalf of dairy foods processors, and better serve the associations' individual members."

"There is strength in numbers," added MIF Chairman Howard Dean. "And with three associations working through the IDFA, we'll be able to accomplish more with greater efficiency."

As of January 1, 1990, the activities of MIF, IICA, and NCI will be managed by IDFA. Although each association will maintain its autonomy, one staff will

execute all three organizations' activities. President and CEO will be E. Linwood Tipton who also serves as president of MIF & IICA. Floyd Gaibler will continue as executive director of NCI and will serve as a vice president of IDFA.

The IDFA Board of Directors will be comprised of 12 industry leaders; 4 will be appointed by each of the organizations' respective Boards. Officers will rotate among representatives from IICA, MIF and NCI. The first Chairman will be a representative from IICA.

MIF & IICA are national trade associations representing milk processors and ice cream manufacturers. Activities range from legislative and regulatory advocacy to market research, education, and training. MIF has 220 member companies that process 80 percent of the fluid milk and fluid milk products consumed nationwide. IICA has 200 member companies that manufacture and distribute an estimated 85 percent of the ice cream and ice cream-related products consumed in the United States.

For more information contact Constance E. Tipton, 202/296-4250.

The Publication of Industry's First Compendium on Biological Treatment Case Histories

Biological Treatment can provide safe, inexpensive, and complete elimination of a variety of environmental contaminants. Bioremediation offers a permanent solution to a wide range of industrial and domestic wastes. When such treatment is appropriately applied, the result can be the conversion of many pollutants to carbon dioxide, water and cell mass.

Yet, the lack of knowledge about biological treatment, which depends on living organisms and their products necessary for this technology to be considered ready for application is causing delay in its utilization according to members of the Applied BioTreatment Association. To address this informational gap, on November 29th the Board of Directors of the Applied BioTreatment Association hosted a press conference announcing the publication of its first compendium of success stories describing biology-based waste remediations.

The ABTA Compendium, according to Jason Caplan (Hunter BioSciences), the project chairman, is designed as a living document, ready for additions as more firms provide success stories to the Association. A goal of publishing further additions at least twice a year has been set by the members of the Association.

In the Compendium's introduction, A. Keith Kaufman (Thorne Environmental), President of the Applied BioTreatment Association, notes, "[i]t has often been said of biotreatment technology that it is 'the wave of

the future' and will be utilized with increasing frequency in the months and years ahead for a variety of industrial and environmental applications. This will only occur, however, when regulatory and public sectors share an understanding of the technology which is based on fact rather than fiction. We hope you will feel, as we do, that this Compendium serves well in the attainment of this objective."

The report, priced at \$18.00 (with discounts for large volume orders and for ABTA members), contains one page descriptions of successful applications of biology based treatment including 22 field remediations, 8 treatability studies, and 8 pilot studies. A list of 47 chemicals and waste products which have been successfully biodegraded is also included.

The Applied BioTreatment Association was organized in the spring of 1989 as an organization dedicated to educating government decision makers and the public about how biological treatment works and about the uses of such treatment in waste minimization, degradation, and cleanup.

For more information contact Sue Markland Moreland, Executive Director, Applied BioTreatment Association, P.O. Box 15307, Washington, D.C. 20003.



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Food and Environmental Hazards To Health

Fatalities Attributed to Methane Asphyxia in Manure Waste Pits - Ohio, Michigan, 1989

In June and July 1989, a total of seven farm workers in two separate incidents died after they were asphyxiated by methane gas in manure pits. Brief reports follow.

Ohio. On June 26, 1989, a 31-year-old male dairy farmer and his 33-year-old brother died after entering a 25-foot-square by 4 1/2-foot-deep manure pit inside a building on their farm. A pump intake pipe in the pit had clogged, and the farmer descended into the pit to clear the obstruction. While in the pit, he was overcome by lack of oxygen and collapsed. His brother apparently saw him collapse and entered the pit in an attempt to rescue him. The brother, too, was overcome and collapsed inside the pit. Four hours later, another family member discovered the two men, and the local fire department was called to rescue them. The coroner's report attributed the cause of death in both cases to drowning, secondary to loss of consciousness from methane asphyxia.

Michigan. On July 26, 1989, five farm workers in one family died after consecutively entering an outdoor manure pit on a farm. The pit measured 20 feet by 24 feet by 10 feet deep. The victims were a 65-year-old male dairy farmer, his two sons (aged 37 and 28 years), a 15-year-old grandson, and a 63-year-old nephew. The index victim, the 37-year-old son, initially entered the pit by ladder to replace a shear pin on an agitator shaft. While attempting to climb out of the pit, he was overcome and fell into the bottom of the pit. The grandson then entered the pit to attempt rescue. He, too, was overcome and collapsed. One by one, the nephew, the younger son, and the dairy farmer entered the pit in attempts to rescue the others, were overcome by lack of oxygen, and collapsed. A carpet installer working at the farm then entered the pit as a rescuer and was overcome; however, he was rescued by his assistant and subsequently recovered. Finally, the owner of a nearby business arrived with two additional workers and, using a rope, extricated the five victims from the pit. When paramedics arrived, they began cardiopulmonary resuscitation. The nephew was pronounced dead at the scene, and the other four victims were transported to the emergency room of a nearby hospital. The dairy farmer and his younger son were pronounced dead on arrival at the hospital; the 37-year old son died 1 hour after reaching the emergency room. The grandson was transferred by helicopter to a major trauma center, but died within 6 hours of his removal from the pit. For the four older victims the medical examiner attributed the cause of death to methane asphyxia. Assignment of the official cause of death for the grandson awaits completion of the autopsy report.

Editorial Note: Acute traumatic occupational deaths in the United States are monitored by the Division of Safety Research, National Institute for Occupational Safety and Health (NIOSH), CDC, through the National Traumatic Occupational Fatalities (NTOF) file. For 1980 through

1985, the NTOF data file includes 16 work-related deaths that involved asphyxiation of workers in manure pits (or similar waste tanks) on farms. These deaths resulted from nine separate incidents in nine different states. Five of these episodes resulted in multiple fatalities. Because NTOF only includes deaths of workers ≥ 16 years of age that are clearly identified as work-related, these 16 deaths represent the minimum number of asphyxiation fatalities that occurred during this period among U.S. farmers, farm family members, farm workers, and others working in manure pits.

A farm manure waste pit is a confined space, defined by NIOSH as a space that "by design has limited openings for entry and exit; unfavorable natural ventilation which could contain or produce dangerous air contaminants; and which is not intended for continuous worker occupancy." Manure pits are fermentation tanks where raw animal wastes undergo anaerobic bacterial decay. This bacterial action generates methane, hydrogen sulfide, and other gases. Methane is a colorless, odorless, and flammable gaseous hydrocarbon. It can displace oxygen in confined areas, resulting in an oxygen-deficient atmosphere. Hydrogen sulfide is a highly toxic, colorless gas that at concentrations of ≥ 300 ppm can cause unconsciousness, respiratory failure, and sudden death. If these gases are not properly vented from a tank or other confined space, an oxygen-deficient or toxic atmosphere may be created. In industrial settings, the Occupational Safety and Health Administration (OSHA) limits permissible peak exposures to hydrogen sulfide to a ceiling of 50 ppm (for ≤ 10 minutes); NIOSH recommends a ceiling of 10 ppm (for ≤ 10 minutes). There is no OSHA permissible exposure limit for methane. OSHA exposure standards are not enforceable on farms with ≤ 10 employees.

The apparent tendency for episodes such as those described here to result in multiple fatalities is a major concern. Fatal incidents resulting from entry into manure pits often involve more than one victim; the deaths of any additional workers occur during rescue attempts conducted without use of appropriate equipment and safety precautions. Investigations performed by NIOSH as part of the Fatal Accident Circumstances and Epidemiology Project show that approximately 43% of confined-space-related deaths involved co-workers or other persons who were attempting to rescue the initial victim(s) (NIOSH, unpublished data). The hazards of confined spaces and improper rescue methods have been addressed in previous NIOSH publications, including a guide to safe work practices in confined spaces.

In the two events reported here, hot humid weather may have contributed to the generation of methane gas and increased the amount of gas in the manure pits. The possible connection between hot weather and increased gas accumulation in manure tanks is also suggested by the NTOF data. All 16 deaths identified in the NTOF file occurred in April through September, with the highest number occurring in August. Farmers should be made aware of

the particular hazards of entering manure pits during the summer months.

NIOSH is preparing information for farm operators on the hazards of manure pits and recommendations for safely evaluating, ventilating, and entering (when absolutely necessary) manure pits. Recommendations will also be provided for the safe conduct of rescue operations in circumstances such as those described in this report. NIOSH will disseminate this information during the fall.

MMWR 8/25/89

Imported Dengue - United States, 1987

In 1987, 94 cases of imported dengue-like illness (i.e., illness following exposures thought to have occurred outside the United States) were reported to CDC from 29 states. Eighteen cases (from 10 states and the District of Columbia) were serologically or virologically confirmed as dengue; 53 were serologically negative for dengue, and the etiology of 23 remained undetermined because only a single early serum sample was received.

Travel histories indicated that the confirmed dengue infections had been acquired in four countries in Latin America, three islands in the Caribbean, five countries in Asia, and one country in Africa. The infecting virus serotype was determined for five patients: DEN-1 for patients infected in Mexico and Venezuela, DEN-2 for patients infected in Indonesia and India, and DEN-4 for a patient infected in El Salvador. Among the 15 patients for whom age was reported, ages ranged from 22 to 79 years.

Each patient had a classical dengue syndrome with onset of illness occurring shortly after return to the United States. One patient, a 28-year-old man with a primary DEN-2 infection acquired in India, reported bloody diarrhea. No other hemorrhagic manifestations were reported.

Three of the confirmed cases were reported from Florida and Georgia, where the principal vector of dengue, *Aedes aegypti*, occurs.

Editorial Note: Dengue is an acute viral disease caused by any of four dengue virus serotypes and manifested by sudden onset of fever, headache, and myalgia, and often by rash, nausea, and vomiting. Thrombocytopenia, as well as hemorrhagic manifestations such as petechiae, epistaxis, and menorrhagia, may also occur. Most infections result in relatively mild illness; however, a small percentage of patients may have a severe form of the disease, dengue hemorrhagic fever, which is characterized by severe hemorrhage and/or shock.

Dengue fever is widespread in the Caribbean, tropical American, Oceania, Asia, and tropical Africa, and from 1977-1987 health-care providers in the continental United States reported an annual average of 31 patients with dengue acquired abroad.

Because *Ae. aegypti*, the principal vector mosquito of dengue, is found in the southeastern United States, indigenous transmission of dengue in these areas is possible. The most recent known transmission within the continental United States occurred in 1986 in an area of Texas infested by *Ae. aegypti*. An Asian dengue vector, *Ae. albopictus*, has recently become established in focal areas

of the eastern United States as far north as latitude 42 N; however, no case of disease transmission by this mosquito in the continental United States has been documented.

Public health officials and clinicians should be aware of the potential for dengue transmission in any area infested with dengue mosquito vectors. Dengue should be considered in the differential diagnosis for any patient with an acute febrile illness and a history of recent travel to tropical areas. If dengue is suspected, the patient's hematocrit and platelet count should be evaluated, and acute- (<5 days from onset) and convalescent-phase (≥14 days from onset) serum samples should be obtained. Suspected dengue should be reported and serum samples sent for confirmation through the state health department to: Dengue Branch, Division of Vector-Borne Viral Diseases, Center for Infectious Diseases, CDC, GPO Box 4532, San Juan, Puerto Rico 00936; telephone (809) 749-4400.

MMWR 7/7/89

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Industry Products



UniPure™ II

UniPure™ II Water Purification Systems are designed to take incoming tap water and purify it to the most exacting standards. Utilizing unique modules instead of archaic cartridges, UniPure delivers purified water with greater flow rates, higher capacities, and at a lower cost than other systems. UniPure addresses the removal of organics, ions, pyrogens, particles, colloids and bacteria.

Solution Consultants - Marietta, GA

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Alspray Chlorine Fog Gun

The Supply Corporation is pleased to offer the Alspray Chlorine Fog Gun. This fog gun operates on compressed air and is used with chlorine solution and other sanitizers for heavy-duty cleaning and sanitizing of tanks and equipment. The Alspray Chlorine Fog Gun is ruggedly constructed of heavy-duty rubber and nickel-plated brass fittings and is designed to operate on 35 to 175 pounds of air pressure. The Supply Corporation - Lake Geneva, WI

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Open-Top Plastic Drums

Manufacturers of shredded cheese can pack, handle and ship product more safely, easily and economically with open-top plastic drums from Sonoco Plastic Drum, a division of Sonoco Products Company.

Featuring removable covers with a variety of locking devices, Sonoco "O" Series drums facilitate fast, easy filling of cheese. In addition, the high-molecular weight polyethylene drums minimize risk of food contamination, because they require no linings, which can fracture, chip or crack, and the drums' resiliency resists dents and cracks. Plus, the durable drums are easy to clean.

Sonoco plastic drums comply with U.S. Department of Agriculture specifications and the Food, Drug and Cosmetic Act.

Sonoco Products Co. - Hartsville, SC

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Fractional-Size Ball Valves

Lee Industries' Fluid Transfer Division offers fractional-size 1/2" and 3/4" sanitary in-line ball valves. Precision made of T-316-L stainless steel, these valves are designed for corrosion-resistant, sanitary applications in the food, cosmetic, pharmaceutical, and beverage industries.

The solid construction of Fluid Flow fractional-size valves provides maximum reliability and failure-free performance under the most extreme conditions. Cleanup and maintenance costs are substantially reduced, due to a unique, simple two-piece design that allows extremely fast breakdown by hand, no tools required.

Standard fully encapsulated Mica-Filled Teflon seals provide the maximum reduction in product entrapment while full ports, also standard, eliminate product flow restrictions. A polished #4 ID/OD is standard while electropolish is offered as an option.

Lee Industries' Fluid Transfer Division manufactures a complete line of USDA approved sanitary ball valves.

Lee Industries, Inc. - Philipsburg, PA

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Humidity/Temp Recorder

Self-contained Humidity/Temp Recorder enables storage of high and low peak values for temperature and humidity with microprocessor accuracy. Measures humidity from 2 to 98% with +/-3% accuracy plus temperature from 2 to 120 Deg. F and -17 to 40 Deg. C with +/-1 Degree accuracy. Large 8" charts make it easy to read both measurements or program the bright LCD display to indicate either Temperature or Humidity. Convenient front panel selection of functions include choice of 1, 7 or 32 day operation, dual LCD display which indicates low battery and parameters with second display for time of day and date/clock indication. Removable plug-in internal sensor can be attached to a 6 ft. cable for remote measurements. AC or battery operated, Recorder comes complete with retractable handle, RH/Temp sensor with 6 ft. cable, 20 of each chart, four 1.5 volt "D" batteries and 110 VAC adaptor.

EXTECH Instruments Corp. - Waltham, MA

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Brochure Describing Sequencing Batch Reactor

A brochure describes the sequencing batch reactor system designed for the biological treatment of wastewaters. The brochure contains a description of the SBR system and explains why it is effective in treating strong or variable organic loads, highly variable daily hydraulic flow patterns, and environmentally sensitive areas which require advanced treatment. The brochure also describes the SBR's natural 5-step process of fill, react, settle, decant and idle, as well as the specific biological reactions which occur in each phase.

Purestream Inc. - Florence, KY

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Model III ssx C.D.T.TM Differential Switch Pressure Test Device

The Crombie Company announces a new model of its C.D.T.TM Differential Pressure Switch Test Device for the testing of pressure controls on HTST pasteurization systems.

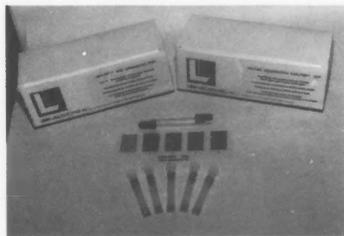
Easy to use, newly designed sanitary adapters are provided with the Model III ssx. The new adapters allow direct connection of the control pressure sensors to the C.D.T.TM Device and eliminate the need for user-supplied sanitary elbows or spool pieces between the pressure sensors and the testing device.

The new adapters are of nylon. A 1/8-inch cavity is machined into the face of the adapters to allow clearance for the diaphragms of both digital and capillary type pressure sensors. A modified hose cap with sanitary threads is supplied as is the 45° standard sanitary half-union adapter. This allows the sanitary nuts on the pressure sensors to attach directly to the C.D.T. Device adapters.

The new adapters can be used with any of the previous models of the C.D.T.TM Device, and may be purchased separately.

The Crombie Company - Joliet, IL

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Frying Oil Quality Quick Test

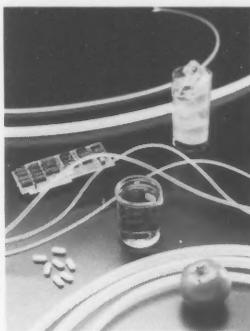
The VERI-FRYTM diagnostic test for TOTAL POLAR MATERIALS allows industrial, restaurant, and institutional fryers to quickly and easily determine the quality of their frying oils. Researchers in the United States and overseas, particularly in Europe, have found that polar materials, and not free fatty acids, are the best indicator of frying oil degradation.

The TPM test itself develops a color in just one step. The operator adds hot oil into the tube to a marker line, shakes to melt and mix the reactive compounds, and compares the resulting color to a color card. The test may be used as an easily portable quality control tool where food is being prepared, or by auditors or health inspectors.

All reactive components of the test are GRAS and Kosher.

LIBRA LABORATORIES - Piscataway, NJ

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High purity, chemically resistant, translucent Bev-A-Line Tubing resists staining and next batch contamination in food, beverage, chemical, pharmaceutical, laboratory and other sanitary liquid handling process applications.

Thermoplastic Processes Flexible Bev-A-Line Tubing

High purity, translucent, flexible Bev-A-Line tubing from Thermoplastic Processes, Inc. combines two tubings in one to provide greater resistance to chemical attack, staining and next batch contamination.

The unique Bev-A-Line IV and V HT shells provide durability and strength while maintaining greater flexibility than standard polyethylene tubing, while the Bev-A-Line liner maintains the purity of process fluids. Resistant to alcohols, acids, caustics and solvents, the Bev-A-Line liner provides a stable environment of maintaining product pH.

Bev-A-Line tubing is extruded from materials that comply with FDA, NSF, USDA, Pharmacopeia XXI, Class VI and National Formulary standards.

Thermoplastic Process - Stirling, NJ

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New Sampler for Powdered Milk

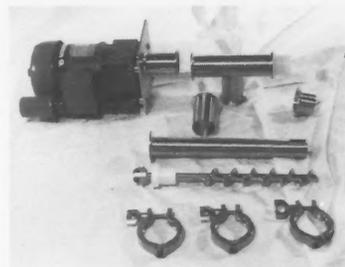
The U.S.D.A. has recently approved the Gustafson Model Dairy B-1 Sampler for use on powdered milk and other applications requiring 3A dairy construction.

The sampler consists of a sample tube and auger for mounting in a gravity chute or hopper. The auger is reversing to allow purging of the sample tube before taking a sample. The sample auger is highly polished to prevent sticking of the powder. A tri-clover connection is used to mount the sampler on the customer's product line. The sampler can be removed and disassembled quickly for cleanout.

Furnished with a special sample chamber and an NIR moisture analyzer, the sampler can be used for on-line moisture control at the discharge of a spray dryer.

Gustafson Communications - Dallas, TX

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Column Dumper From Hercules Industries

Hercules Industries, manufacturer of drum and container dumpers for over 30 years, is pleased to announce COLUMN DUMPERS have now been added to their product line. Especially effective for applications where floor space or headroom is restricted, column dumpers can be designed to dump mixing bowls, carts, buggies, vats, drums, totes, boxes plus a variety of other containers customized to users' needs. U.S.D.A. accepted designs are available - dumpers handle up to 600 lb. containers at dump heights up to 7 ft. Spiral screw elevating mechanism provides smooth, even lifting. Stainless steel construction with glass bead blasted finish - column dumpers are available with left or right hand side dumping configurations. Predetermined dump heights may be adjusted in the field. Portable or stationary models available.

Hercules Industries - Nashville, TN

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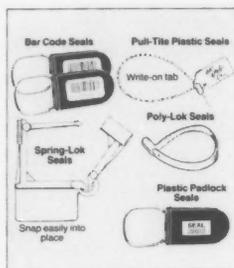
ARL's ICP Spectrometer

For in-house and CLP-approved environmental labs, Applied Research Laboratories (ARL) offers a low-cost, bench-height ICP spectrometer ideally suited for EPA-approved low-trace level detection of drinking water and waste water.

The ARL Model 3410 ICP is designed to consume 40% less argon and power than its more expensive ICP counterparts, which results in substantial cost savings for any around-the-clock lab. Operating under EPA/CLP protocol software, the Model 3410 is stable and reliable, important requirements in the environmental setting where the same type of samples are run with high frequency.

Fisons Instruments - Valencia, CA

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Seton's Self-Locking Seals

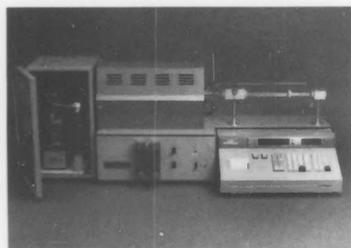
Whatever degree of security against tampering is demanded - from the mild discouragement of a plastic seal to the theft prevention of a steel lock - Seton has the seal to fit any need and budget.

All-plastic seals are designed for tamper-evident securing of control panels, storage compartments, fire extinguishers or anywhere that mild discouragement is required.

For more durable, long-term protection Seton offers seals constructed of both plastic and metal. These seals are a stronger deterrent to theft and are tamper-resistant, yet they can be removed without the use of tools.

Seton Name Plate Company - New Haven, CT

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The TOX-10

The Tox-10 utilizes a simple titration cell design along with a high performance coulometer and microprocessor to make TOX (Total Organic Halogen) analysis easier than ever. Results are automatically calculated and reported in ppb, ppm or percent on the integral printer.

The TOX-10 follows EPA recommended methodology for determining total organic halogen.

Recoveries of bromides and chlorides are in excess of 95 percent with relative standard deviations of less than 5 percent.

EPA method 9020, EPA method 450.1, ground water monitoring, drinking water analysis, RCRA compliance, NPDES permitting and solid waste management all require TOX be measured. The TOX-10 makes this tough task as easy as it can be.

Cosa Instrument Corp. - Norwood, NJ

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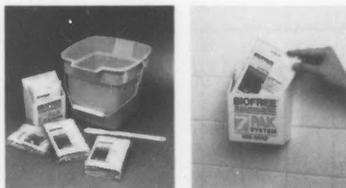
New Book on Benchmarking

The hottest and least understood new term on the quality field comes to life in the latest Quality Press release by Robert C. Camp, Benchmarking: The Search for Industry Best Practices That Lead to Superior Performance.

Benchmarking is also an ongoing investigation and learning experience ensuring that best industry practices are uncovered, analyzed, adopted, and implemented. Camp's 17 years of experience with the Xerox corporation include starting their benchmarking program. This book gives examples to show how to relate benchmarking to your own circumstances, a reference guide to get started, case histories and personal tips to help you, with minimum effort, effectively launch your quest for the best.

ASQC Quality Press - Milwaukee, WI

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BioFree, A Better Biological Greaseater

BioFree, an easy-to-use biological drain maintenance system that completely liquefies and digests grease and drain residue safely, is available from InterBio, Inc.

Proven to dramatically reduce drain grease maintenance costs in four of the nation's top restaurant chains, BioFree is biodegradable and environmentally safe. The product is USDA-approved for use in food areas.

BioFree consists of a combination of naturally-occurring, laboratory-bred micro-organisms that help prevent drain and grease trap build-up by liquefying and digesting a wider variety of wastes than any other product of its kind.

Easy-to-use, premeasured packets of powdered BioFree are mixed with warm water and then poured into each drain and sink. Each BioFree package is clearly labeled with a day of the week to eliminate product waste and provide convenient monitoring by management.

InterBio Inc. - Naperville, IL

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Trap-N-A-Sak

Anchor Animal Health introduces two new sizes of Trap-N-A-Sak[®] rodenticide - the 12 lb. bulk pail and the convenient 6 pack.

Trap-N-A-Sak is the only rodenticide with a patented sweet corn base that rats prefer 4 to 1.

In conjunction with the introduction of the two new sizes, and as part of a nationwide promotional campaign, Anchor is giving away 20 cruises to the Bahamas for purchases of Trap-N-A-Sak rodenticide.

Anchor is a division of Boehringer Ingelheim Animal Health, Inc., a diversified producer of biologicals, pharmaceuticals, growth implants, microbials, and insecticides for livestock and companion animals.

Boehringer Ingelheim Animal Health, Inc. - St. Joseph, MO

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Chemical Fixation Service for Hazardous Metal Waste Cleanup

ProTek environmental, Inc. announced a new technology and service for on-site chemical fixation of hazardous wastes. Called "ProFix", this proprietary chemical fixation and stabilization process treats in-organic and heavy metal-contaminated soils and sludges. Contaminants are treated in a controlled manner and rendered non-hazardous according to environmental agency regulations. The result is a solid polymer matrix in which the soluble metal contaminants are converted to a stable, insoluble metal silicate.

ProTek specializes in the application of its own Advanced Bioremediation, Vapor Extraction and Chemical Fixation technologies to remediate sites where contaminated soils, sludges, and groundwaters are a problem.

ProTek Environmental, Inc. - Huntingdon Beach, CA

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PIGLET™ Belt Cleaner

The PIGLET™ Belt Cleaner, a new modular food grade belt cleaning system that provides effective removal of carryback on belt conveyors operating at up to 100 feet per minute has been introduced by Martin Engineering Company.

The PIGLET™ Belt Cleaning System is suitable for installation on conveyor belts in operations where a clean belt surface is important to the appearance, performance, or quality of the finished product. Applications would include product assembly finishing, sorting, or packaging, and other operations where carryback can contaminate the product, build up to damage conveyor components, or drop off along the return run to dirty the plant.

The PIGLET™ Belt Cleaner is designed so that no metal components are placed in the material flow.

The components of PIGLET™ Belt Cleaners are fabricated from stainless steel and white USDA/FDA-approved food grade molded thermoplastic, so it is durable, non-corroding, and resistant to oil and many chemicals. The system itself is easily cleaned with warm water and detergent.

Martin Engineering Company - Neponset, IL

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Intrinsically Safe Portable PPM Oxygen Analyzer

Teledyne's Model 311 is the only parts-per-million oxygen analyzer offering true portability and Factory Mutual (FM) approved intrinsic safety for Class I, Division 1, Groups A, B, C, and D hazardous areas. Weighing just 6 lbs., the Model 311 is a convenient way to quickly and simply spot-check gas phase ppm O₂ in a wide variety of quality assurance and process monitoring applications.

The Model 311 features an integral rechargeable battery, eliminating cumbersome external AC cords and powering the analyzer for up to 30 days between charges. The Model 311 also features four measuring ranges of 0-10, 0-100, 0-1000, 0-10,000 ppm O₂, a special span range for air calibration, and an easy-to-read analog meter.

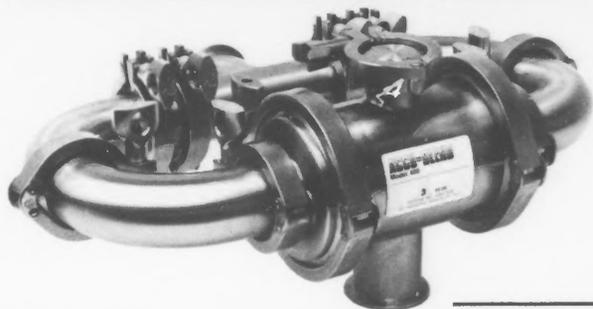
Teledyne Analytical Instruments develops, designs, and manufactures analyzers and systems for a wide variety of industrial applications.

Teledyne Analytical Instruments -
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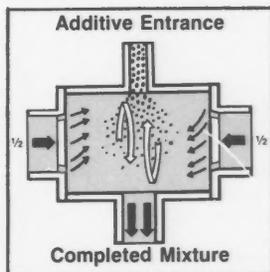
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Main liquid splits in two. The opposing streams collide, causing super hydraulic shear creating instantaneous mixing of powders into liquids; liquids into liquids; or gases into liquids.



During a recent manager certification training course I was stressing the importance of handwashing and how managers should set the example. Five students in class immediately raised their hands with the following questions and comments:

"If it's so important to set an example, why don't the inspectors wash their hands before inspections?"

"The last inspector that came into my place must have been working on his car. He had grease and dirt all over his hands!"

"We had a lady inspect us last month - she had a ring on every finger - then wrote us up for an employee wearing a wedding ring."

"I know the hands are important, but what about the feet? Last year I swear our inspector had just inspected a dairy farm. He had cow manure on the bottom of his boots!"

The only response I could think of was "well, sanitarians are only human". Of course there is no excuse for the grease and dirt, or the rings and condition of the shoes that were described by the students. Unfortunately, for these managers it will take quite a bit to change their perception of the "health inspector".

While these statements reflect a very small percentage of our profession, they did cause me to stop and think about appearance and other professional attributes that are important for sanitarians to consider. From the time an "inspector" first enters a foodservice operation, you can be sure that all eyes are focused on what the inspector does or doesn't do. How many times have you heard employees whisper:

"He's not wearing a head cover. No need for us to worry about wearing one." "She put that thermometer in the roast without washing it off. Must not be important." "He didn't even unplug the meat slicer when he checked it. Why does the manager tell us to unplug it when we clean it?"

It would be interesting to know what I/AMFES members think about the handwashing issue. Should sanitarians be required to wash their hands before conducting inspections? Is this a requirement in any local/state health department or by consultants working in the food industry? Do you include this as part of the training for new sanitarians. Is it important for sanitarians to set the example during inspections?

OFF THE CLIPBOARD: FDA's Retail Food Protection Branch has completed the translation of food code provisions in the following languages: Chinese, Korean, Vietnamese, and Spanish. This is a noteworthy contribution that will fulfill a major gap in food sanitation training. An English version is also available for use by regulatory officials. These translations will be a valuable tool to use in communicating critical food sanitation information to an important segment of the foodservice industry. State and local health departments can duplicate the translations using their own department logo and their own code section numbers. Gordon Brown, FDA Program Manager in Region III, was one of several key individuals that guided the development of the translation. Hats off to Gordon and other FDA staffers for this new and valuable training resource. Details on how to obtain copies of the code translations will be provided next month.

by **Homer C. Emery, RS**
Chair, FDA Interpretations Committee

- Los Angeles has approved a ban on truck deliveries during rush hours in an attempt to meet air quality standards. They may require some food distributors to make off-hour and late-night deliveries to foodservice operations. Other metro areas may approve similar bans. Local health agencies should ensure that limiting delivery times for potentially hazardous foods doesn't result in unexpected food safety problems.

- Kudos to the National Restaurant Association for their January 9th Solid Waste Management Symposium. The NRA Symposium brought together representatives from the foodservice industry, state and local regulatory officials and top solid waste experts to discuss topics ranging from innovations in disposal technology to recycling. It will take leadership initiatives such as this to solve solid waste problems now faced by the foodservice industry.

- The Fivco District Health Department in Kentucky has produced several handouts to explain code requirements to foodservice workers. Handouts can be provided to managers during inspections to help make the inspection process a true educational experience. Send a stamped and self-addressed envelope to P.O. Box 1832, Frederick, Maryland 21701 for copies of these handouts.

February Field Inspection Quiz

- Several foodborne pathogens are capable of forming spores. Which one of the following pathogens is a spore former?
A. *Yersinia enterocolitica*
B. *Bacillus cereus*
C. *Campylobacter jejuni*
- Of the following foodborne pathogens which is the fastest multiplying spore former?
A. *Clostridium botulinum*
B. *Yersinia enterocolitica*
C. *Clostridium perfringens*
- While inspecting a sushi bar (raw fish) the operator asks for recommendations for freezing fish to kill parasites. You should advise:
A. Serving raw fish is prohibited.
B. Freeze at 10 F or below and hold for 7 days.
C. Freeze at 0 to 10 F and hold for 12 hours.
D. Blast freeze to -31 F or below and hold 15 hours.
- You've been asked to recommend an antifreeze to use in a nursing home fire sprinkler system. You should advise:
A. using propylene glycol
B. using ethylene glycol
C. 30% salt solution
- What type of backflow prevention device should be used in the above fire sprinkler system?
A. reduced pressure principle device
B. double check valve assembly
C. automatic atmospheric relief valve

Answers to January FIQ: 1. (C); 2. (A); 3. (C) Federal Insecticide, Fungicide and Rodenticide Act; 4. (A); 5. (A). If you have items for the field inspection quiz send them in. Make sure you provide answers.

Affiliate News



Richard Ledford (L) receives gavel from Paul Dersam to become the 63rd President of New York State Association of Milk and Food Sanitarians.

NYSAMFS Hold 66th Annual Meeting in Buffalo

The 66th Annual Conference of New York State Association of Milk and Food Sanitarians was held September 19-22, 1989 in cooperation with Cornell University Food Science Department, Institute of Food Science, New York State Department of Health and New York State Department of Agriculture and Markets. Held at the Sheraton Buffalo Airport Hotel, over 330 persons registered for the event.

Formal activities began on Tuesday evening with a talk on Cocoa Beans from Plant to finished Products given by Robert Kiefer, Nestle Chocolate Co. The General Session on Wednesday began with President Paul J. Dersam's Presidential Address. Keynote speakers for this general session included Donald B. Torgersen, Rich Products Corporation, who discussed Achieving Success in the Food Industry. Also, a talk on Dioxins and Other Potential Contaminants in Milk and Food Packages: Cause for Concern? was given by David Firestone, US FDA. Deputy Commissioner of New York State Dept. Ag. & Markets Dwayne L. Lipinski gave an Overview of the Department.



New York State Association of Milk and Food Sanitarians 1988-89 Executive Board (L-R) Newsletter Editor, John Bartell; Chairman, Council of Affiliates, Eric Dutton, Board Members, Len Jones, Jack Baker, Terry Musson; President Paul Dersam; President-elect Richard Ledford; Past-President John Baxter and Cornell Coordinator, David Bandler

Concurrent Sessions highlighted the Wednesday afternoon program for laboratory, field and food personnel.

Titrate Acid and pH, How Today's Students are Preparing for Job in the Food Industry, Sensory Evaluation and a USPH Laboratory Update were subjects of experts in the laboratory session. At the same time, in the fieldman's session, topics included: What Was New At the 1989 IMS

Upcoming IAMFES Affiliate Meetings

MARCH

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

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

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

APRIL

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

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

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

MAY

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

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

JUNE

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

SEPTEMBER

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

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

Conference, Free Stall Design in Relation to Mastitis Control, Clean Water and Dairy Equipment Service in the 90's.

The food session featured presentations on Pesticides and Food Safety. Reducing the Risk in Risk Communication and Terrorism & The Food Supply.

Triple sessions on Thursday morning, September 21st

included Fieldman Topics on Storage of Bulk Chemicals and Petroleum Products, the Shur-graph Monitor, Computerization of Dairy and Food Plants and a Report on Check Ratings and the IMS Program in New York. Laboratory Personnel heard about Aflatoxin, Basic Nutrition and Dietary Fiber, Petrifilm For Total Aerobic Counts, Coliform and E. coli Enumeration, and Yeast and Mold Plates. Also, there was a discussion on the Report Immunoassay for Salmonella & Listeria Detection. Food Sanitarians heard papers on Potential Hazards Associated with Vacuum and Modified Atmosphere Packaging, an Update on Viruses in Food and a Consultant's Role in Food Protection.



NYSAMFS Council of Affiliates Luncheon (L-R) Henry Mapes, South Central Affiliate, Eric Dutton, Council Chairman, Richard Ledford, 1989-90 President; Dale Chilton, chairman, Equipment committee and Steve Halstead, Executive Director, IAMFES.

Both the Past Presidents and Council of Affiliates held luncheon meetings. At the council luncheon, the Catskill Mountain Affiliate received the annual "Affiliate of the Year Award".

At the Awards Banquet, five major awards were presented including the Emmet R. Gauh Award which was given to Immediate Past President Paul J. Dersam. Paul is also currently Executive Secretary/Treasurer of our association. The EMMET R. GAUHN Memorial Award is the Association's highest honor and is given in memory of the Association's first President whose foresight, diligence and devotion to the cause of progressive milk sanitation serve as an inspiration and guide to the members of the association. Following the award presentations, Richard A. Ledford, Chairman of the Department of Food Science, Cornell University, Ithaca was advanced to President of the New York Association. Dr. Ledford succeeded Paul Dersam, Supervisor of Raw Milk and Farm Inspection, Upstate Milk Coop., LeRoy, NY. Jerome A. Hopcus, plant sanitarian for Henry and Henry, a Lancaster, NY based cookie, pie filling and soda fountain toppings firm, was elected to the Executive Board. There was, of course, a full complement of activities for spouses.

During the past year, in addition to the many programs sponsored by the 14 affiliate associations, NYSAMFS sponsored a Pesticide Certification Course in conjunction with Cooperative Extension, co-sponsored with Cornell University and FDA a seminar entitled "Good Manufacturing Practices" for Food Establishments. The NYSAMFS Food Committee also sponsored a Pesticide Applicator's Recertification Workshop.

Ontario Food Protection Association Annual Meeting

The Meeting was opened by OFPA President Patrick Kwan.

Past-President Michael Brodsky opened the technical session "Foodborne Listeriosis: Science or Politics" and introduced the first speaker, Dr. Jeff Farber of the Health Protection Branch, Health and Welfare Canada.

Dr. Farber gave a general introduction to Listeria and foodborne listeriosis. He provided an overview of the occurrence of Listeria in meat and dairy products, and in the processing plants from which these foods come. He also detailed the current methodologies for the detection and isolation of Listeria from food.

Dr. Joost Harwig, also of Health Protection Branch, continued the discussion relating to Listeria in foods, detailing control strategies, recall policies and sampling approaches. Keys to control are to be found in GMP's and HACCP programs. Rationale for sampling plans, as well as for Class I and Class II recalls, are based on the risk level of the food involved and on the likelihood of the food to support the growth of Listeria.

Dr. Monika Naus, of the Public Health Branch, spoke on the history and epidemiology of listeriosis in Ontario. Information was provided relating to methods of diagnosis, variables involved, seasonality, risk groups, symptoms and reliability of reporting.

Dr. Chuck LeBer, also from the Public Health Branch, spoke to the group on the effect of recalls instituted thus far for Listeria-contaminated foods. Recalls for soft cheeses are of the Class I variety and were the most common in 1988, but Class II recalls for meat products are on the rise in 1989. The cooperation received from processing and retail levels in recall matters has been very good.

The OFPA Business Meeting was called to order at approximately 11:30 AM by President Patrick Kwan.

Patrick Kwan gave the President's address to the membership, wherein he introduced the Board of Directors and thanked them for their efforts in 1989; provided a brief membership report (286 Regular Members and 28 Sustaining Members); discussed previous OFPA workshops on HACCP, WHMIS and Product Labeling; solicited suggestions and assistance from the membership for future workshops; and provided highlights of his attendance at the 1989 IAMFES Annual Meeting in Kansas City.

Mr. Steven Halstead, the Executive Manager of IAMFES, addressed the membership, at Michael Brodsky's invitation, to detail the requirements for the OFPA hosting of the 1992 IAMFES Annual Meeting.

The membership vote to support the Board of Directors' bid to host the IAMFES Meeting in 1992 was unanimous.

The Honorary Life Membership Award was introduced by Patrick Kwan. It was awarded to J.D. Cunningham and was accepted for him with thanks by I.R. Patel.

The Board of Directors' Award for Exceptional Merit was presented to I.R. Patel by Patrick Kwan for his many years of service in and support of the OFPA.

The OFPA Scholarship, offered through the University of Guelph, was awarded this year to E. Lee, a fourth

year Applied Microbiology student.

Past-President Michael Brodsky presented the recommended slate of officers for the 1990 OFPA Board of Directors.

The 1990 Board of Directors was accepted by the membership.

The President's Gavel was presented to the incoming President, Bob Tiffin, by the outgoing President, Patrick Kwan.

The Past-President's Plaque and Gavel was presented to Patrick Kwan by Bob Tiffin.

The meeting was adjourned by Bob Tiffin.

Michael Brodsky called the afternoon technical session to order and introduced Dr. Tom Morse of Clearwater Fine Foods to speak on industry perspectives of the Listeria issue.

Dr. Morse gave a lively presentation on his experiences in the seafood industry over recent years where Listeria has been involved. He detailed his experiences with foreign customers, government sampling plans, GMP development, media involvement and joint HPB/DFO plant inspections.

Dr. Tom Hinsberger, of Wm. Neilson Ltd., spoke to the group on experiences with Listeria in the dairy industry. He explained that Listeria has been a very real problem for him and showed concern for its potential as a health hazard. He detailed control measures used within the industry from the farm level to the processing level and provided examples of intensive sampling plans.

Dr. Garth Sundeen, of the Canadian Meat Council, spoke on behalf of the meat industry, providing details on the various ways in which some companies have met the challenge of Listeria. He outlined points on post-processing contamination, critical control areas, cleaning and sanitizing, process controls and facility design.

After our final speaker, the technical session was concluded with a roundtable discussion, where questions were posed to a panel of all the day's speakers by session attendees. Several interesting comments and concerns were raised from the floor.

Bob Tiffin presented, on behalf of the OFPA, each of the speakers with a small token of appreciation for their excellent effort.

Michael Brodsky declared the session closed with the comment that we all have a lot to learn and much work to do in the area of Listeria.

TAMWFP 1989 Fall Meeting

The fall meeting of the Tennessee Association of Milk, Water and Food Protection was held on November 15, 1989 at the Garden Plaza Hotel in Murfreesboro, TN with 44 members and guests present.

The meeting was presided by President Gil Murrey. Bob Allard, Manager of Heritage Farms Dairy, welcomed the group to Murfreesboro.

Gale Prince of the Kroger Company in Cincinnati, Ohio gave a talk on Retail Food Safety.

Dr. Patrick Doyle of Middle Tennessee State University, gave a talk on Surface Water Contamination from solid waste disposal.

After a milk break, Hank Menees from the TN Dept. of Agriculture, gave the group an update on Tennessee's manufacturing milk program. Gene Casto of the Murfreesboro Water Dept. gave a talk entitled: "Do We Take Water Quality for Granted?"

President-Elect, Hugh Wilson, conducted a drawing for door prizes. Winner of the grand prize, a Tennessee country ham, was Steve Jones from Land-O-Sun Dairy, Kingsport, TN.

After lunch, the meeting ended with a tour of Heritage Farms Dairy.

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IAMFES Secretary Candidates



Harold Bengsch

Harold Bengsch is Director of the Springfield-Greene County Missouri Department of Health and has 30 years of continuous service in the field of public health with much of his professional experience in environmental microbiology and epidemiology.

Harold was raised on a dairy farm in Southwest Missouri and after completing high school at Billings he attended college at Southwest Missouri State University in Springfield where he received his B.S. in a double major in Agriculture Science. Later he earned his Master of Science in Public Health from the University of Missouri, Columbia, School of Medicine.

In addition, he has completed post graduate training with the United States Public Health Service and the Environmental Protection Agency in the field of Analysis and Biomedical Effects of Environmental Contaminants.

Harold has been a long time member of the IAMFES and is past president of the Missouri affiliate. He has served on several different committees of the International and is currently a member of the Applied Laboratory Methods Committee and is Chairman of the Publications Committee of *Dairy, Food and Environmental Sanitation*. As Chairman of the DFES Publication Committee his major goal has been that of enhancing the visibility of the International among practicing sanitarians and the promotion of professional growth of the Journals' readership.

Harold has just completed a 12 year period of service on the Executive Board of the National Conference on Interstate Milk Shipments and is a current member of the NCIMS Laboratory Methods Committee. He is currently a member of the State of Missouri Food Advisory Council and the State Milk Board. In addition, he serves the Task Force on Clean Air, Clean Water and Toxic Waste Superfund of the United States Conference of Local Health Officers.

A highlight of Harold's career occurred in 1977 when the IAMFES bestowed on him the Sanitarians Distinguished Service Award.

Harold and his wife, Darlene, live in Springfield where they enjoy gardening, photography, church activities and spoiling their grandkids.



Ewen C. D. Todd

Ewen Todd is a research scientist in the Bureau of Microbial Hazards, Health Protection Branch, Health and Welfare Canada in Ottawa. He has been employed by the Branch since 1968 when he immigrated to Canada after graduating from the University of Glasgow with a Ph.D. in Bacteriology. As head of the Contaminated Foods Section he has been involved with a number of national and international foodborne disease investigations, such as Salmonella and staphylococcal contamination of cheese, clostridium botulinum toxin in Inuit foods and canned products, and domoic acid in cultivated mussels. Some of the areas that he has worked in and published on are health hazards of barbecued chickens, Gonalis (gyros) poultry and frozen cream pies. He is currently working on improving methodology for detection of *E. coli* 0157:H7 in foods and of seafood toxins in fish and shellfish. As Chairman of the Foodborne Disease Reporting Center he has been collecting and collating data on foodborne disease and waterborne disease in Canada since 1973. Articles on such disease have been published in the *Journal of Food Protection* since 1976. Because there has been a lack of data on the economical aspects of food poisoning, Ewen has been taking an interest in the costing of foodborne illnesses, and what actions should be taken to prevent these. As a part of the Branch strategy to reduce the number of cases, he has been a resource person to the Canadian Restaurant and Foodservices Association to help them produce a Sanitation Code, A National Sanitation Training Program and video "HACCP: Your Safe Food System".

He has been active in the International Association of Milk, Food and Environmental Sanitarians since 1976 when he became a member of the Committee on Communicable Diseases Affecting Man. This Committee has since produced two editions of Procedures to Investigate Foodborne Illness and similar Procedures for Waterborne Illness, and Rodent-borne and Arthropod-borne Illness. He is at present working with the Committee to produce a Procedures manual on HACCP. He also serves on the Scientific Program Advisory Committee and was responsible for organizing a symposium on Seafood Toxins at the 1988 Kansas City meeting. He is currently on the Journal Management Committee and serves on the Editorial Board of the *Journal of Food Protection*.

He has published over 110 papers in scientific journals and government publications, and made more than 120 presentations at national and international scientific meetings.

Letter to the Editor

Presently, an acute public health problem exists for at risk consumers of raw shellfish harvested from the U.S. Gulf Coast waters containing *Vibrio vulnificus*. Numerous illnesses and deaths associated with *V. vulnificus* infections have occurred over the past ten years.

Retrospective review of these cases have revealed that individuals with chronic illnesses such as: (1) hepatic disease or (2) compromised immune systems can develop primary septicemia from eating raw oysters contaminated with *V. vulnificus*. A mortality rate of greater than 50 percent occurs in susceptible individuals who develop primary septicemia.

Vibrio vulnificus is a marine bacterium that naturally occurs in Gulf waters and has been recovered from the shell surfaces and internal organs of shellfish. It has been estimated that up to ten percent of the raw shellfish, crabs and shrimp on the market may have *V. vulnificus*. Current federal and state shellfish sanitation regulations utilize the fecal coliform test for approving shellfish meats for human consumption. However, little, if any relationship exists

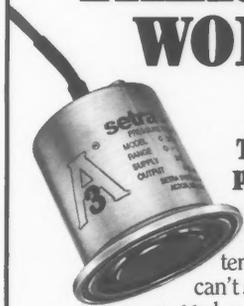
between the current fecal coliform standard and the presence or absence of *V. vulnificus* in shellfish meats and associated shellfish harvesting waters.

There presently exists no sanitation or public health regulations that will lower or free shellfish of *V. vulnificus* or control the presence and/or growth. Moreover, this foodborne illness presents a major challenge for the medical, public health, shellfish and regulatory sectors of the Gulf Coast. For this reason, public health efforts should be directed to properly inform consumers at risk. In addition, since the *V. vulnificus* contaminated shellfish problem can not be solved using established sanitation regulations, further shellfish processing investigations in the areas of temperature-inactivation of vibrios in processed oysters and large scale depuration of harvested oysters.

Dr. Gary E. Roderick, Ph.D.
Associate Professor
Food Science and Human Nutrition Department
University of Florida

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 612-785-0484

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

Updates . . .

Don't Forget the New Company Listings in the 1990-1991 IAMFES Membership Directory

There is still time to reserve your company's listing in the Directory. Whether you work for a large multi-national food processor or are an independent consultant to the dairy industry, the 1990-1991 IAMFES Membership Directory has a place for you. To reserve your company's listing in up to two of the nine categories, complete the top post card adjacent to page 53. Return the card, with payment, to IAMFES *NO LATER THAN MARCH 15, 1990*. Or FAX your listing to IAMFES at (515)232-4736. Any company placing a classified or display advertisement in the Directory will receive a complimentary listing (in **BOLD FACE TYPE**) in up to two categories. For further information on the Directory Listings or Advertising, contact Scott Wells at IAMFES, 800-369-6337.

Remember - No Listings will be accepted after March 15, 1990.

Second Annual Labeling Class April 23-24

An American Institute of Baking seminar in Manhattan, Kansas, will help ensure product labels meet federal regulations, that they are accurate and will meet fair advertising and labeling standards. For more information contact James L. Vetter, Ph.D., American Institute of Baking, 1213 Bakers Way, Manhattan, KS 66502 (800)633-5137.

Two-Day AIB Pest Control Seminar April 2-3

Seven pest control experts will give an advanced seminar for the food processing industry April 2-3 in Manhattan, Kansas, coordinated by AIB, 1213 Bakers Way. For more information contact Bill Pursley, at (913)537-4750 or (800)633-5137.

Third Annual Beverage Industry Conference

The Third Annual Beverage Industry Conference will be held April 23-25, 1990 at the Hotel Intercontinental, Chicago, IL. For more information contact Carmen Bjelde at (800)331-8816.

1990 ACDPI Annual Meeting, March 11-14, Omni Royal Orleans New Orleans, Louisiana

Plan now to join with your industry friends and colleagues as one of America's most exciting cities, New Orleans, plays host to the cultured dairy foods industry. A unique educational experience, good food, good music, and good times -- it all comes together in the Crescent City. For more information contact the American Cultured Dairy Products Institute office, 888 Sixteenth Steet, NW, Washington, DC 20006 (202)223-1931.

5th Annual Cheesemaking Short Course

Washington State University will hold its 5th Annual Cheesemaking Short Course March 5-8, 1990 at Nendels Motor Inn, Pullman, Washington. For more information contact contact the University at (509)335-2946.

Environmental Regulation Course

Executive Enterprises, Inc. presents A Basic Comprehensive Course on Environmental Regulation.

- March 19-21, 1990, Chicago, Illinois
- April 23-25, 1990, Cleveland, Ohio
- May 21-23, 1990, New Orleans, Louisiana

For more information contact Executive Enterprises (within U.S.) at (800)831-8333 or (212)645-7880.

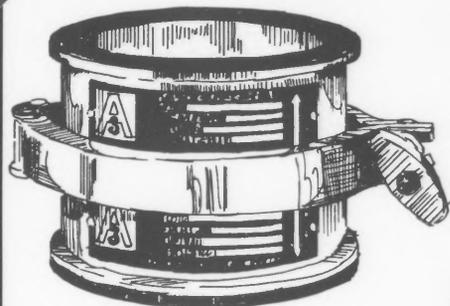
A-to-Z of Container Corrosion

The Food Processors Institute will hold a course on "A-to-Z of Container Corrosion" on Tuesday, March 27, 1990, at the Wyndham Bristol Hotel, 2430 Pennsylvania Avenue, NW, Washington, DC. For more information contact The Food Processors Institute, 1401 New York Avenue, NW, Suite 400, Washington, DC 20005 (202)393-0890.

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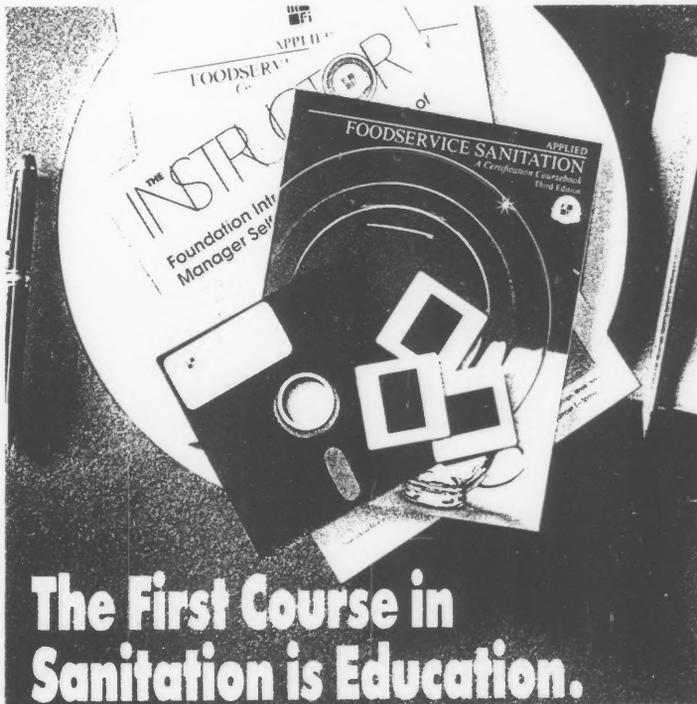
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77th IAMFES Annual Meeting Registration

Woodfield Hilton and Towers - Arlington Heights, Illinois - August 5-9,

(Use photocopies for extra registrations)

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Other Fees: (Per Person)

Cheese & Wine Reception (Sun., 8/5)
"Taste of Chicago" (Mon., 8/6)

Art Institute, Lunch, Sears Tower (Mon., 8/6)
Long Grove Shopping, Lunch (Mon., 8/6)
Water Tower Place, Lunch, Shopping (Tues., 8/7)
Haeger Pottery Tour, Lunch, Shopping (Tues., 8/7)
Morton Arboretum, Lunch, Shopping (Wed., 8/8)
Kraft Cooking Demo (Hotel) (Wed., 8/8)
IAMFES Awards Banquet (Wed., 8/8)

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Registration Information

Send payment with registration to IAMFES, 502 E. Lincoln Way, Ames, IA 50010-6666. Make checks payable to IAMFES. Pre-registration must be post-marked by July 30, 1990. The pre-registration deadline will be strictly observed. For additional information contact Julie Heim at 1-800-369-6337.

Refund/Cancellation

The IAMFES policy on meeting cancellations is as follows: "Registration fees, minus a \$15.00 processing fee, will be refunded on written cancellations post-marked at least 14 days prior to the start of the meeting. No refunds will be made on cancellations less than two (2) weeks prior to the start of the meeting. Registration may be transferred with written

IAMFES

77th Annual Meeting Special Events Program

LONG GROVE VILLAGE/HOBSON HOUSE RESTAURANT

Monday, August 6, 1990

9:30 a.m. - 3:30 p.m.

Cost: \$20.00 (Includes Lunch)

Turn your watch back to yesteryear and explore the treasures at a crossroads in our country's past! We'll be taking you to Long Grove, a 19th Century village featuring antiques, boutiques and over 100 charming and unique specialty shops. Relax and enjoy lunch at Hobson House Restaurant, family-owned for more than 25 years and featuring a homemade, buffet-style lunch served in garden surroundings. Your afternoon is free to continue shopping, sampling fresh apple cider and homemade fudge or simply visit with friends in a charming atmosphere untouched by progress. (Tour limited to 46 people).

ART INSTITUTE TOUR

Monday, August 6, 1990

Cost: \$25.00 (Includes Lunch)

One of the World's leading art museums is located in Chicago. This tour will show it to you. You will be picked up at the hotel and driven to the Art Institute. The price of admission is included and Monet's Series Paintings will be on exhibit during the time of your visit. Lunch is provided in the garden level restaurant of the Institute. After lunch you will be taken to the Sears Tower. Here on the 103rd floor of the World's tallest building, you will look down upon the East, West, North and South beauty of Chicago. Admission to the Tower is included. (Tour limited to 46 people).

HAEGER POTTERY/MILK PAIL VILLAGE

Tuesday, August 7, 1990

9:00 a.m. - 3:30 p.m.

Cost: \$20.00 (Includes Lunch)

The world's largest art pottery awaits you on this guided walking tour of Haeger Potteries. Watch the old world master potter spin works of art on his potter's wheel. You will browse through the factory outlet salesroom and select your favorite art pottery pieces. We've planned a quaint lunch at the Milk Pail Restaurant, nestled in the beautiful woods and fields of Milk Pail Village and famous for its country fare. Following a delicious meal, shop leisurely through over 20 shops of country ware, paintings, clothing, crafts and one-of-a-kind treasures. (Tour limited to 46 people).

"MAGNIFICENT MILE" — WATER TOWER PLACE TOUR

Tuesday, August 7, 1990

Cost: \$25.00 (Includes Lunch)

Experience the Crown Jewel of Chicago's Magnificent Mile. You will be taken from the hotel, driven along beautiful Michigan Avenue and dropped off at Water Tower Place. Glass-enclosed elevators, fountains and beautiful greenery are just a part of this tremendous shopping and architectural marvel. Not a millionaire? That's O.K., browsing is fun, too! Lunch is provided at "the 95th" — an elite Chicago dining experience. Situated on the 95th floor of the John Hancock building, this restaurant offers an unparalleled view of Chicago. (Tour limited to 45 people).

MORTON ARBORETUM TOUR

Wednesday, August 8, 1990

Cost: \$20.00 (Includes Lunch)

The Morton Arboretum is a 1,500 acre preserve consisting of native Illinois prairie and forest land and beautiful cultivated gardens. Tour participants will be taken from the hotel to the Arboretum. Once there, an Arboretum Naturalist will come on board the bus to narrate a tour of the grounds. Lunch is included and will be served in picturesque "Ginkgo Restaurant" overlooking Crabapple Lake. After lunch, ample time will be given for browsing in the gift shop, strolling among the flower gardens or viewing a slide show provided by the Arboretum. (Tour limited to 45 people).

KRAFT COOKING DEMONSTRATION (WOODFIELD HILTON AND TOWERS HOTEL)

Wednesday, August 8, 1990

Cost: FREE

Kraft Cooking Demo will be held at the Woodfield Hilton and Towers. Details on this event will be published at a later date.

Holders of 3-A Symbol Council Authorization on February 15, 1990

Questions or statements concerning any of the holders authorizations listed below, or the equipment fabricated, should be addressed to: Robert F. Wolf, Administrative Officer, 3-A Symbol Council, W255 N477 Grandview Blvd., Suite 100, Waukesha, Wisconsin 53188.

01-06 Storage Tanks for Milk and Milk Products

115	A-L Stainless Inc. 113 Park St., South Peterborough, Ontario, Canada K9J 3R8	(9/28/58)
2	APV Crepaco, Inc. 100 South CP Ave. Lake Mills, Wisconsin 53551	(5/1/56)
28	Cherry-Burrell Corporation (A Unit of AMCA Int'l., Inc.) 575 E. Mill St. Little Falls, New York 13365	(10/3/56)
102	Chester-Jensen Co., Inc. 5th & Tilghman Sts., P.O. Box 908 Chester, Pennsylvania 19016	(6/6/58)
117	DCI, Inc. P.O. Box 1227, 600 No. 54th Ave. St. Cloud, Minnesota 56301	(10/28/59)
76	Damrow Company (A Div. of DEC Int'l., Inc.) 196 Western Ave., P.O. Box 750 Fond du Lac, Wisconsin 54935-0750	(10/31/57)
172	Paul Mueller Co. P.O. Box 828 Springfield, Missouri 65801	(6/29/60)
440	Scherping Systems 801 Kingsley St. Winsted, Minnesota 55395	(3/1/85)
432	TCI-Superior 611 Sugar Creek Rd. Delavan, Wisconsin 53115-0953	(11/8/84)
571	Viatic Process/Storage Systems 500 Reed St. Belding, Michigan, 48809	(8/21/89)
31	Walker Stainless Equipment Co., Inc. Elroy, Wisconsin 53929	(10/4/56)

02-08 Pumps for Milk and Milk Products

63R	AVP Crepaco, Inc. 100 South CP Ave. Lake Mills, Wisconsin 53551	(4/29/57)
325	Albin Pump, Inc. (Mfg. by Albin Motor, Sweden) 120 Interstate N. Pkwy. E. #208 Atlanta, Georgia 30339-2103	(12/19/79)
214R	Ben H. Anderson Manufactures	(5/20/70)

	Morrisonville, Wisconsin 53571	
212R	Babson Brothers Company Dairy Systems Division 1400 West Gale Galesville, Wisconsin 54630	(2/20/70)
29R	Cherry-Burrell Corp. (A Unit of AMCA Int'l., Inc.) 2400-6th St. SW, P.O. Box 3000 Cedar Rapids, Iowa 52406	(10/3/56)
205R	Dairy Equipment Co. 1919 S. Stoughton Rd., P.O. Box 8050 Madison, Wisconsin 53716	(5/22/69)
377	Energy Service Co. (Mfg. by Lederle, Germany) B200 Walker Bldg., 734 15th St., NW Washington, DC 20005	(2/4/83)
462	Enprotech Corporation 335 Madison Avenue New York, New York 10017	(12/5/85)
466	Fluid Metering Inc. 29 Orchard St. Oyster Bay, New York 11771	(1/10/86)
306	Fristam Pumps, Inc. 2410 Parview Road Middleton, Wisconsin 53562	(5/2/78)
65R	G & H Products Corp. 7600-57th Avenue P.O. Box 1199 Kenosha, Wisconsin 53141	(5/22/57)
492	A. Gusmer Inc. Mfg. by Philip Hilge GmbH 27 North Avenue East Cranford, New Jersey 07016	(1/15/87)
145R	ITT Jabsco Products (Mfg. by ITT Jabsco, England) 1485 Dale Way Costa Mesa, California 92626	(11/20/63)
502	INOXPA, S.A. (not available in USA) c/. Telers, 54 17820 Banyoles (Verona) Spain	(4/27/87)
314	Len E. Ivarson, Inc. 3100 W. Green Tree Rd. Milwaukee, Wisconsin 53209	(12/22/78)
373	Luwa Corporation (Mfg. by MAAG Gear, Switzerland) P.O. Box 16348 Charlotte, North Carolina 28297-6348	(12/27/82)
319	MGI Pumps Inc. (Mfg. by SSP Pumps, England) 847 Industrial Dr. Bensenville, Illinois 60106	(3/21/79)
400	Netzsch Incorporated 119 Pickering Way Exton, Pennsylvania 19341-1393	(8/15/83)

241	Puriti, S.A. de C.V. Alfredo Nobel 39 Industrial Puente de Vigas Tlalnepantla, Mexico	(9/12/72)	37	AVP Crepaco, INC. 100 South CP Ave. Lake Mills, Wisconsin 53551	(10/19/56)
148R	Robbins & Myers, Inc. 1895 Jefferson St. Springfield, Ohio 45506	(4/22/64)	75	APV Gaulin, Inc. 44 Garden St. Everett, Massachusetts 02149	(9/26/57)
364	Roper Pump Company P.O. Box 269 Commerce, Georgia 30529	(7/28/82)	390	American Lewa, Inc. (Mfg. by Lewa, Germany) 132 Hopping Brook Road Holliston, Massachusetts 01760	(6/9/83)
568	Shanley Pump & Equipment, Inc. (Mfg. by Allweiler, West Germany) 2255-1 Lois Dr. Rolling Meadows, Illinois 60008	(5/15/89)	247	Bran & Luebbe, Inc. 1025 Busch Parkway Buffalo Grove, Illinois 60015	(4/14/73)
507	Sine Pump Division of The Kontro Co., Inc. 500 West River Street Orange, Massachusetts 01364	(7/21/87)	87	Cherry-Burrell Corp. (A Unit of AMCA Int'l., Inc.) 2400-6th St., SW, P.O. Box 3000 Cedar Rapids, Iowa 52406	(12/20/57)
567	Stainless Products, Inc. 1649-72nd Ave. P.O. Box 169 Somers, Wisconsin 53171	(4/4/89)	486	Fowler Products Company 150 Collins Industrial Blvd. P.O. Box 1706 Athens, Georgia 30613-1706	(11/18/86)
332	TCI-Superior 611 Sugar Creek Rd. Delavan, Wisconsin 53115-0953	(12/10/80)	309	Niro Atomizer Food & Dairy Inc. (Mfg. by Masinfabriken, Denmark) 1600 County Road F Hudson, Wisconsin 54016	(7/19/78)
72R	L.C. Thomsen Inc. 1303-43rd St. Kenosha, Wisconsin 53140	(9/14/57)	558	SOAVI B. & FIGLI S.p.A. (not available in USA) 43100 Parma (Italy) VIA M. Da Erba Edoari, 29A	(1/3/89)
582	Tri-Clover Canada, Ltd. P.O. Box 430 220 Park Road North Brantford, Ontario N3T 5P3	(11/9/89)	425	TCI-Superior 611 Sugar Creek Rd. Delavan, Wisconsin 53115-0953	(8/31/84)
26R	Tri-Clover, Inc. 9201 Wilmot Road Kenosha, Wisconsin 53141	(9/29/56)	05-14 Stainless Steel Automotive Milk Transportation Tanks for Bulk Delivery and/or Farm Pick-up Service		
175R	Universal Cooperatives, Dairy Dairy Division U.S. Hwy 33 East/Box 115 Goshen, Indiana 46526	(10/25/56)	379	Bar-Bell Fabricating Co., Inc. RR 2 Mauston, Wisconsin 53948	(3/15/83)
471	VNE Corporation (Mfg. by Pumpen-Und Maschinebbau West Germany) 1415 Johnson Street Janesville, Wisconsin 53545	(4/27/86)	70R	Brenner Tank, Inc. 450 Arlington Ave., P.O. Box 670 Fond du Lac, Wisconsin 54935	(8/5/57)
329	Valex Products Corp. 6080 Leland Street Ventura, California 93003	(6/10/80)	45	The Heil Company 1125 Congress Pkwy. P.O. Box 160 Athens, Tennessee 37303-0160	(10/26/56)
52R	Viking Pump, Inc. A Unit of IDEX Corporation 406 State Street Cedar Falls, Iowa 50613	(12/31/56)	40	Hills Stainless Steel & Equipment Co., Inc. 505 W. Koehn Street Luverne, Minnesota 56156	(10/20/56)
5R	Waukesha Pumps (A Unit of AMCA Int'l. Inc.) 1250 Lincoln Ave. Waukesha, Wisconsin 53186	(5/6/56)	66	Kari-Kool Transports, Inc. P.O. Box 538 Beaver Dam, Wisconsin 53916	(5/29/57)
408	Westfalia Systemat (Mfg. by Westfalia, West Germany) 1862 Brummel Drive Elk Grove Village, Illinois 60007	(10/18/83)	201	Paul Krohnert Mfg. Ltd. (not available in USA) 811 Steeles Ave., P.O. Box 126 Milton, Ontario, Canada L9T 2Y3	(4/1/68)
			513	Nova Fabricating Inc. Jct. I-94 & Co Road 9 P.O. Box 231 Avon, Minnesota 56310	(8/24/87)
04-03 Homogenizers and High Pressure Pumps of the Plunger Type			85	Polar Tank Trailer, Inc. Holdingford, Minnesota 56340	(12/20/57)
			521	R & D Stainless	

	409 S. Hampton Republic, Missouri 65738		454 Jensen Fittings Corp. 107-111 Goundry St. North Tonawanda, New York 14120-5998	(9/11/85)
189	A & L Tougas, Ltee (not available in USA) 1 Tougas St. Iberville, Quebec, Canada	(10/3/66)	287 Koltek, Inc. Div. of Alfa Laval (Mfg. Koltek, Finland) 100 Pinnacle Way, Suite 165 Norcross, Georgia 30071	(1/14/77)
25	Walker Stainless Equip. Co., Inc. 618 State St. New Lisbon, Wisconsin 53950	(9/28/68)	389 Lee Industries, Inc. P.O. Box 688 Philipsburg, Pennsylvania 16866	(5/31/83)
437	West-Mark 2704 Railroad Ave., P.O. Box 418 Ceres, California 95307	(11/30/84)	239 Lumaco, Inc. P.O. Box 688 Teaneck, New Jersey 07666	(6/30/72)
08-17 Rev. Fittings Used on Milk and Milk Products Equipment and Used on Sanitary Lines Conducting Milk and Milk Products				
349	APN, Inc. 400 W. Lincoln Caledonia, Minnesota 55921	(12/15/81)	200R Paul Mueller Co. 1600 W. Phelps St., Box 828 Springfield, Missouri 65801	(3/5/68)
260	APV Crepaco, Inc. (08-17 A&B) 100 South CP Avenue Lake Mills, Wisconsin 53551	(5/21/75)	242 Puriti, S.A. de C.V. Alfredo Nobel 39 Industrial Puente de Vigas Tlalnepantla, Mexico	(9/12/72)
470	Advance Stainless Mfg. Corp. 218 West Centralia Street Elkhorn, Wisconsin 53121	(3/30/86)	424 Robert-James Sales, Inc. P.O. Box 1672, 269 Hinman Ave. Buffalo, New York 14216-0672	(8/31/84)
380	Allegheny Bradford Corp. P.O. Box 200 Route 219 South Bradford, Pennsylvania 16701	(3/21/83)	334 Stainless Products, Inc. 1649-72nd Ave., Box 169 Somers, Wisconsin 53171	(12/18/80)
79R	Alloy Products Corp. 1045 Perkins Ave., P.O. Box 529 Waukesha, Wisconsin 53187	(11/23/57)	391 Stork Food Machinery, Inc. (Mfg. by Stork Amsterdam, Netherlands) P.O. Box 1258/Airport Parkway Gainesville, Georgia 30503	(6/9/83)
443	Badger Meter, Inc. 6116 East 15th Street Tulsa, Oklahoma 74158	(5/1/85)	300 Superior Stainless, Inc. 611 Sugar Creek Rd. Delavan, Wisconsin 53115	(11/22/77)
82R	Cherry-Burrell Corp. (A Unit of AMCA Int'l. Corp.) 2400-6th St. SW, P.O. Box 3000 Cedar Rapids, Iowa 52406	(12/11/57)	357 Tanaco Products 3860 Loomis Trail Rd. Blaine, Washington 98230	(4/16/82)
478	Ciprianai, Inc. (Mfg. by Fratelli Tassalini, Italy) 23195 La Cadena Drive, Suite 103 Laguna Hills, California 92653	(7/31/86)	449 Tech Controls Enterprise Co., Ltd. (Mfg. in Taiwan) 2940-200 SE Issaquah, Washington 98027	(8/2/85)
528	Dayco Products Inc. 333 West First Street Dayton, Ohio 45402-3042	(3/16/88)	73R L.C. Thomsen, Inc. 1303-43rd. St. Kenosha, Wisconsin 53140	(8/31/57)
509	Fitting Speciality 1303 35th Street Kenosha, Wisconsin 53140	(8/7/87)	581 Tri-Clover Canada, Ltd. P.O. Box 430 220 Park Road North Brantford, Ontario N3T 5P3	(11/9/89)
455	Flowtech Inc. 1900 Lake Park Dr. Suite 345 Smyrna, Georgia 30080	(9/17/85)	34R Tri-Clover, Inc. 9201 Wilmot Rd. Kenosha, Wisconsin 53141	(10/15/56)
271	The Foxboro Company 33 Commercial Street Foxboro, Massachusetts 02035	(3/8/76)	304 VNE Corporation (Mfg. by Egmo, Israel) 1415 Johnson St., P.O. Box 187 Janesville, Wisconsin 53547	(3/16/78)
67R	G & H Products Corp. 7600-57th Avenue P.O. Box 1199 Kenosha, Wisconsin 53141	(6/10/57)	278 Valex Products Corp. 6080 Leland Street Ventura, California 93003	(8/30/76)
369	IMEX, Inc. (Mfg. by Lube Corp., Japan) 4040 Del Ray Ave. Unit 9 Marina del Rey, California 90292	(11/3/82)	08-17A Compression Type Valves	
			533 APV Crepaco, Inc. 100 S. CP Ave.	(5/21/75)

- Lake Mills, Wisconsin 53551
- 484 APV Rosista, Inc. (10/22/86)
(Mfg. by APV Rosista, Inc. W. Germany & Denmark)
1325 Samuelson Rd.
Rockford, Illinois 61109
- 566 Advance Fittings Corp. (3/31/86)
218 Centralia St.
Elkhorn, Wisconsin 53121
- 552 Alloy Products Corp. (11/23/57)
1045 Perkins Ave.
P.O. Box 529
Waukesha, Wisconsin 53187
- 245 Babson Brothers Company (2/12/73)
Dairy System Division
1400 West Gale Ave.
Galesville, Wisconsin 54630
- 555 Cherry-Burrell Corp. (12/11/57)
2400 6th Street S.W.
Cedar Rapids, Iowa 52406
- 538 Cipriani, Inc. (7/31/86)
(Mfg. by Fratelli Tassalini, Italy)
23195 La Cadena Drive, Suite 103
Laguna Hills, California 92653
- 376 Defontaine, Inc. (1/25/83)
(Mfg. by Defontaine, France)
563 A.J. Allen Circle
Wales, Wisconsin 53183
- 530 G & H Products Corp. (6/10/57)
7600-57th Ave.
P.O. Box 1199
Kenosha, Wisconsin 53141
- 480 GEA Food and Process Systems Corp. (8/8/86)
8940 Route 108
Columbia, Maryland 21045
- 559 Kolttek, Inc. (1/6/89)
Div. of Alfa Laval
(Mfg. by Kolttek, Finland)
100 Pinnacle Way, Suite 165
Norcross, Georgia 30071
- 570 LUMACO (8/9/89)
9-11 East Broadway
Hackensack, New Jersey 07601
- 483 On-Line Instrumentation, Inc. (10/15/86)
Rt. 376, P.O. Box 541
Hopewell Junction, New York 12533
- 551 Puriti, S.A. de C.V. (9/12/72)
Alfredo Nobel 39
Fracc. Ind. Puente de Vigas
Tlalnepantla, Mexico
- 149R Q-Controls (5/18/64)
Subsidiary of Cesco Magnetics
93 Utility Court
Rohnert Park, California 94928
- 542 L.C. Thomsen Inc. ((8/31/57)
1303-43rd. St.
Kenosha, Wisconsin 53140
- 579 Tri-Clover Canada, Ltd. (11/9/89)
P.O. Box 430
220 Park Road North
Brantford, Ontario N3T 5P3
- 34A Tri-Clover, Inc. (10/15/56)
9201 Wilmot Rd.
Kenosha, Wisconsin 53141
- 467 Tuchenagen North America Inc. (1/13/86)
(Mfg. by Otto Tuchenagen, West Germany)
4119 W. Greentree Road
Milwaukee, Wisconsin 53209
- 561 VACU-PURG, Inc. (1/26/89)
214 West Main St.
P.O. Box 272
Fredericksburg, Iowa 50630
- 543 Valex Corp. (8/30/76)
6080 Leland St.
Ventura, California 93003
- 584 Valvinox Inc. (11/27/89)
654 Iere Rue.
Iberville-QUE-Canada J2X 3B8
- 86R Waukesha Specialty Co., Inc. (12/20/57)
P.O. Box 160, Hwy 14
Darien, Wisconsin 53144
- 08-17B Diaphragm-Type Valves**
- 565 APV Rosista, Inc. (10/22/86)
(Mfg. by APV Rosista, Inc. W. Germany & Denmark)
1325 Samuelson Rd.
Rockford, Illinois 61109
- 514 H. D. Bauman Assoc., Ltd. (8/24/87)
35 Mirona Road
Portsmouth, New Hampshire 03801
- 203R ITT Grinnell Valve Co., Inc. (11/27/68)
Dia-Flo Division
33 Centerville Rd.
Lancaster, Pennsylvania 17603
- 494 Saunders Valve, Inc. (2/10/87)
15760 W. Hardy, #440
Houston, TX 77060
- 544 Valex Corp. (8/30/76)
6080 Leland St.
Ventura, California 93003
- 08-17C Boot-Seal Type Valves**
- 545 Valex Corp. (8/30/76)
6080 Leland St.
Ventura, California 93003
- 08-17D Automatic Positive Displacement Sampler**
- 291 Accurate Metering Systems Inc. (6/22/77)
(Mfg. by Diessel, Germany)
1650 Wilkening Ct.
Schaumburg, Illinois 60173
- 284 Bristol Engineering Co. (11/18/76)
210 Beaver St.
P.O. Box 696
Yorkville, Illinois 60560
- 546 Valex Corp. (8/30/76)
6080 Leland St.
Ventura, California 93003
- 08-17E Inlet and Outlet Leak-Protector Plug Valve**
- 553 Alloy Products Corp. (11/23/57)
1045 Perkins Ave.
P.O. Box 529
Waukesha, Wisconsin 53187
- 556 Cherry-Burrell Corp. (12/11/57)

- 2400 6th Street S.W.
Cedar Rapids, Iowa 52406
- 34E Tri-Clover, Inc. (10/15/56)
9201 Wilmot Rd.
Kenosha, Wisconsin 53141
- 547 Valex Corp.
6080 Leland St.
Ventura, California 93003
- 08-17F Tank Outlet Valve**
- 539 Cipriani, Inc. (7/31/86)
(Mfg. by Fratelli Tassalini, Italy)
23195 La Cadena Drive, Suite 103
Laguna Hills, California 92653
- 531 G & H Products Corp. (6/10/57)
7600-57th Ave.
P.O. Box 1199
Kenosha, Wisconsin 53141
- 534 Lumaco (6/30/72)
9-11 East Broadway
Hackensack, New Jersey 07601
- 548 Valex Corp. (8/30/76)
6080 Leland St.
Ventura, California 93003
- 08-17G Rupture Discs**
- 422 BS & B Safety Systems, Inc. (6/12/84)
7455 E. 46th St.
Tulsa, Oklahoma 74133
- 407 Continental Disc Corp. (10/14/83)
4103 Riverside NW
Kansas City, Missouri 64150
- 549 Valex Corp. (8/30/76)
6080 Leland St.
Ventura, California 93003
- 08-17H Thermoplastic Plug Type Valves**
- 577 Ralet-Defay (11/2/89)
(U.S. Agent GENICANAM, Chazy, NY)
66, Blvd. Poincare
1070 Brussels, Belgium
- 08-17I Steam Injected Heaters**
- 560 Pick Heaters, Inc. (1/19/89)
P.O. Box 516
West Bend, Wisconsin 53095
- 09-07 Instrumental Fittings and Connections Used on Milk and Milk Products Equipment**
- 428 ARI Industries, Inc. (9/12/84)
381 ARI Court
Addison, Illinois 60101
- 321 Anderson Instrument Co., Inc. (6/14/79)
RD #1
Fultonville, New York 12072
- 315 Burns Engineering, Inc. (2/5/79)
10201 Bren Rd., East
Minnetonka, Minnesota 55343
- 206 The Foxboro Company (8/11/69)
33 Commercial Street
Foxboro, Massachusetts 02035
- 418 Niro Atomizer Food & Dairy Inc. (4/2/84)
1600 County Road F
Hudson, Wisconsin 54016
- 487 Pyromation, Incorporated (12/16/86)
5211 Industrial Road
Fort Wayne, Indiana 46825
- 367 RDF Corporation (10/2/82)
23 Elm Ave.
Hudson, New Hampshire 03051
- 495 Rosemount Analytical Division (2/13/87)
2400 Barranca Pkwy.
Irvine, California 92714
- 420 Stork Food Machinery, Inc. (4/17/84)
P.O. Box 1258/Airport Parkway
Gainesville, Georgia 30503
- 32 Taylor Instrument (10/4/56)
Combustion Engineering, Inc.
400 West Avenue, P.O. Box 110
Rochester, New York 14692
- 444 Tukenhagen North America, Inc. (6/17/85)
4119 Green Tree Road
Milwaukee, Wisconsin 53209
- 522 Weed Instrument Company, Inc. (12/28/87)
707 Jeffrey Way
Round Rock, Texas 78664
- 10-03 Milk and Milk Products Filters Using Disposable Filter Media, as Amended**
- 371 Alloy Products Corp. (12/10/82)
1045 Perkins Ave., P.O. Box 529
Waukesha, Wisconsin 53187
- 435 Sermia Equipment Limited (11/27/84)
(Not available in USA)
2511 Barbe Avenue
Chomedey, Laval, Quebec, Canada H7T 2A2
- 296 L. C. Thomsen, Inc. (8/25/77)
1303 43rd St.
Kenosha, Wisconsin 53140
- 580 Tri-Clover Canada, Ltd. (11/9/89)
P.O. Box 430
220 Park Road North
Brantford, Ontario N3T 5P3
- 35 Tri-Clover, Inc. (10/15/56)
9201 Wilmot Road
Kenosha, Wisconsin 53141
- 11-04 Plate-type Heat Exchangers for Milk and Milk Products**
- 365 APV Baker AS (9/8/82)
(not available in USA)
Platinvej, 8
P.O. Box 329
DK-6000 Kolding
Denmark
- 38 APV Crepaco, INC. (10/19/56)
100 South CP Ave.
Lake Mills, Wisconsin 53551

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|-----|--|------------|--|-----------|
| 20 | APV Crepaco, INC.
395 Fillmore Ave.
Tonawanda, New York 14150 | (9/4/56) | Galesville, Wisconsin 54630 | |
| 17 | Alfa-Laval Food & Dairy Co.
(Div. of Alfa-Laval Inc.)
2115 Linwood Ave.
Fort Lee, New Jersey 07024 | (7/28/82) | 103 Chester-Jensen Co., Inc.
5th & Tilghman Sts., P.O. Box 908
Chester, Pennsylvania 19016 | (6/6/58) |
| 120 | Alfa-Laval, Inc.
(DeLaval Agric. Div.)
11100 No. Congress Ave.
Kansas City, Missouri 64153 | (12/3/59) | 298 Feldmeier Equipment, Inc.
6800 Town Line Road
P.O. Box 474
Syracuse, New York 13211 | (1/28/85) |
| 30 | Cherry-Burrell Corp.
(A Unit of AMCA Int'l. Inc.)
2400-6th St. SW, P.O. Box 3000
Cedar Rapids, Iowa 52406 | (10/2/56) | 307 G & H Products Corp.
7600-57th Avenue
P.O. Box 1199
Kenosha, Wisconsin 53141 | (5/2/78) |
| 14 | Chester-Jensen Co., Inc.
5th & Tilghman Sts., P.O. Box 908
Chester, Pennsylvania 19016 | (8/15/56) | 217 Girton Manufacturing Co.
Millville, Pennsylvania 17846 | (1/31/71) |
| 468 | GEA Food and Process Systems Corp.
8940 Route 108
Columbia, Maryland 21045 | (2/2/86) | 238 Paul Mueller Co.
P.O. Box 828
Springfield, Missouri 65801 | (6/28/72) |
| 326 | Karbate Vicarb Inc.
(Mfg. by vicarb, France)
21945 Drake Rd.
Strongsville, Ohio 44136 | (2/4/80) | 96 C. E. Rogers Co.
So. Hwy #65, P.O. Box 118
Mora, Minnesota 55051 | (3/31/64) |
| 15 | Kusel Equipment Co.
820 West St., P.O. Box 87
Watertown, Wisconsin 53094 | (8/15/56) | 532 Scherping Systems
801 Kingsley St.
Winsted, Minnesota 55395 | (6/8/88) |
| 360 | Laffranchi Wholesale Co.
P.O. Box 698
Ferndale, California 95536 | (7/12/82) | 392 Stork Food Machinery, Inc.
(Mfg. by Stork, Netherlands)
P.O. Box 1258/Airport Parkway
Gainesville, Georgia 30503 | (6/9/83) |
| 491 | On-Line Instrumentation, Inc.
P.O. Box 541
Hopewell Junction, New York 12533 | (1/2/87) | 13-08 Farm Milk Cooling and Holding Tanks | |
| 414 | Paul Mueller Co.
P.O. Box 828
Springfield, Missouri 65801 | (12/13/83) | 49R A-L Stainless Inc.
113 Park St., South
Peterborough, Ontario, Canada K9J 3R8 | (12/5/56) |
| 575 | Pro Sales, Inc.
107 2nd Street NW
Auburn, Washington 98001 | (10/13/89) | 240 Babson Brothers Company
Dairy Systems Division
1400 West Gale
Galesville, Wisconsin 54630 | (9/6/72) |
| 279 | The Schlueter Company
(Mfg. by Samuel Parker, New Zealand)
216 Center Ave.
Janesville, Wisconsin 53547 | (8/30/76) | 4R Dairy Equipment Co.
1919 So. Stoughton Rd.
Madison, Wisconsin 53716 | (6/15/56) |
| 472 | Schmidt-Bretten Inc.
1612 Locust Avenue
Bohemia, New York 11716 | (5/7/86) | 179R Heavy Duty Products (Preston) Ltd.
(Not available in USA)
1261 Industrial Rd.
Cambridge (Preston)
Ontario, Canada N3H 4W3 | (3/8/66) |
| 426 | TCI-Superior
611 Sugar Creek Rd.
Delavan, Wisconsin 53115-0953 | (8/31/84) | 12R Paul Mueller Co.
1600 W. Phelps, P.O. Box 828
Springfield, Missouri 65801 | (7/31/56) |

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

- | | | | | |
|-----|--|------------|--|--|
| 438 | APV Crepaco, INC.
395 Fillmore Avenue
Tonawanda, New York 14150 | (12/10/84) | | |
| 248 | Allegheny Bradford Corp.
P.O. Box 200 Route 219 South
Bradford, Pennsylvania 16701 | (4/16/73) | | |
| 243 | Babson Brothers Company
Dairy Systems Division
140 West Gale | (10/31/72) | | |

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

- | | | | | |
|-----|---|------------|--|--|
| 254 | APV Crepaco, Inc.
165 John L. Dietsch Square
Attleboro Fall, Massachusetts 02763 | (1/7/74) | | |
| 132 | APV Crepaco, INC.
395 Fillmore Ave.
Tonawanda, New York 14150 | (10/26/60) | | |
| 277 | Alfa-Laval, Inc.
Contherm Division
P.O. Box 352, 111 Parker St.
Newburyport, Massachusetts 01950 | (8/19/76) | | |
| 500 | Dedert Corporation | (4/9/87) | | |

	2000 Governors Drive Olympia Fields, Illinois 60461		220 Liquipak International, Inc. 2285 University Ave. St. Paul, Minnesota 55114	(4/24/71)
311	GEA Food and Process Systems Corp. (Mfg. by Gebruder, West Germany) 8940 Route 108 Columbia, Maryland 21045	(8/28/79)	330 Milliken Packaging (Mfg. by Chubukikikai, Japan) White Stone, South Carolina 29353	(8/26/80)
273	Niro Atomizer Food & Dairy, Inc. 1600 County Rd F Hudson, Wisconsin 54016	(5/20/76)	442 Milliken Packaging White Stone, South Carolina 29386	(2/21/85)
107R	C.E. Rogers Co. So. Hwy #65, P.O. Box 118 Mora, Minnesota 55051	(7/31/58)	137 Pure-Pak, Inc. 850 Ladd Road Walled Lake, Michigan 48088	(10/17/62)
299	Stork Food Machinery, Inc. (Mfg. by Stork, Holland) P.O. Box 1258/Airport Parkway Gainesville, Georgia 30503	(11/17/77)	281 Purity Packaging Corp. 800 Kaderly Dr. Columbus, Ohio 43228	(11/8/76)
427	TCI-Superior 611 Sugar Creek Rd. Delavan, Wisconsin 53115-0953	(8/31/84)	511 E. P. Remy (Mfg. by E. P. Remy, France) 2096 Gaither Road Rockville, Maryland 20850	(8/14/87)
186R	Marriott Walker Corp. 925 E. Maple Rd. Birmingham, Michigan 48011	(9/6/66)	482 Serac Inc. 1209 Capitol Drive Addison, Illinois	(8/25/86)
17-07 Formers, Fillers and Sealers of Single Service Containers for Milk and Milk Products				
366	Autoprod, Inc. 12 So. Denton Ave. New Hyde Park, New York 11040	(9/15/82)	351 Tetra Pak Inc. (Mfg. by A. B. Tetra, Italy) 889 Bridgeport Ave. P.O. Box 807 Shelton, Connecticut 06484-0807	(1/7/82)
346	B-Bar-B, Inc. E. 10th & McBeth, P.O. Box 909 New Albany, New York 47150	(10/21/81)	211 Twinpak, Inc. (Canada) (Not available in USA) 1840 Route Trans-Canada Dorval, Quebec, Canada H9P 1J8	(2/4/70)
192	Cherry-Burrell Corp. (A Unit of AMCA Int'l., Inc.) 2400-6th St. SW, P.O. Box 3000 Cedar Rapids, Iowa 52406	(1/3/67)	19-04 Batch Continuous Freezers for Ice Cream, Ices, and Similarly Frozen Dairy Foods, as Amended	
382	Combibloc, Inc. (Mfg. by Jagenberg, West Germany) 4800 Roberts Rd. Columbus, Ohio 43228	(4/15/83)	141 APV Crepaco, INC. 100 South CP Ave. Lake Mills, Wisconsin 53551	(4/15/63)
452	Combibloc, Inc. (Mfg. by Gasti, Germany) 4800 Roberts Rd. Columbus, Ohio 43228	(9/4/85)	146 Cherry-Burrell Corp. (A Unit of AMCA Int'l., Inc.) 2400-6th St. SW, P.O. Box 3000 Cedar Rapids, Iowa 52406	(12/10/63)
324	Conoffast (Mfg. by ERCA, France) 1600 Harvester Road West Chicago, Illinois 60185	(11/29/79)	286 O. G. Hoyer, Inc. (Mfg. by O. G. Hoyer A/S, Denmark) 201 Broad Street Lake Geneva, Wisconsin 53147	(12/8/76)
352	GMS Engineering 1936 Sherwood St. Clearwater, Florida 33515	(1/12/82)	401 Coldelite Corp. of America Robinson Rd. & Rt. 17 So. Lodi, New Jersey 07644-3897	(8/22/82)
488	Holmatic Inc. 6691 Jimmy Carter Blvd. Norcross, Georgia 30071	(12/22/86)	465 Leon's Frozen Custard 3131 S. 27th Street Milwaukee, Wisconsin 53151	(12/17/85)
473	International Paper Company Extended Shelf Life Division 4020 Stirrup Creed Drive Bldg. 200 P.O. Box 13318 Research Triangle Park, North Carolina 27709	(6/12/86)	573 Processing Machinery & Supply Company (Mfg. by PMS Italiana, Italy) 1108 Frankford Ave. Philadelphia, Pennsylvania 19125	(9/28/89)
516	Leifeld + Lemke USA (Mfg. by Leifeld + Lemke, West Germany) 25 Whitney Road Mahwah, New Jersey 07430	(9/18/87)	412 Sani Mark, Inc. 2020 Production Drive Indianapolis, Indiana 46241	(11/28/83)
			355 Emery Thompson Machine & Supply Co. 1349 Inwood Ave. Bronx, New York 10452	(3/9/82)

22-04 Silo-type Storage Tanks for Milk and Milk Products

- 262 A-L Stainless Inc. (11/11/74)
113 Park St., South
Peterborough, Ontario, Canada K9J 3R8
- 154 APV Crepaco, Inc. (2/10/65)
100 South CP Ave.
Lake Mills, Wisconsin 53551
- 168 Cherry-Burrell Corp. (6/16/65)
(A Unit of AMCA Int'l, Inc.)
575 E. Mill Street
Little Falls, New York 13365
- 160 DCI, Inc. (4/5/65)
P.O. Box 1227, 600 No. 54th Ave
St. Cloud, Minnesota 56301
- 181 Danrow Co. (5/18/66)
(Div. of DEC Int'l, Inc.)
196 Western Ave., P.O. Box 750
Fond du Lac, Wisconsin 54935-0750
- 312 Feldmeier Equipment, Inc. (9/15/78)
6800 Town Line Road
P.O. Box 474
Syracuse, New York 13211
- 439 JV Northwest Inc. (1/22/85)
28120 SW Boberg Rd.
Wilsonville, Oregon 97070
- 155 Paul Mueller Co. (2/10/65)
1600 W. Phelps, P.O. Box 828
Springfield, Missouri 65801
- 460 Niro Atomizer Food & Dairy Inc. (11/4/85)
1600 County Road F
Hudson, Wisconsin 54016
- 503 Ripley Stainless Ltd. (5/1/87)
(Not available in USA)
RR #3, Site 41
Summerland, British Columbia V0H 1Z0
- 479 Scherping Systems (8/3/86)
801 Kingsley Street
Winsted, Minnesota 55395
- 536 Stainless Fabrication, Inc. (7/14/88)
620 N. Prince Lane
Springfield, Missouri 65802
- 434 TCI-Superior (11/8/84)
611 Sugar Creek Rd.
Delavan, Wisconsin 53115-0953
- 165 Walker Stainless Equipment Co., Inc. (4/26/65)
Elroy, Wisconsin 53929

23-01 Equipment for Packaging Frozen Desserts, Cottage Cheese, and Similar Milk Products, as Amended

- 174 APV Crepaco, Inc. (9/28/65)
Filling & Wrapping Systems Div.
1303 Samuelson Rd.
Rockford, Illinois 61109
- 209 Dobby Packaging Machinery Incorp. (7/23/69)
869 S. Knowles Ave.
New Richmond, Wisconsin 54017
- 222 Fort Howard Packaging Corporation (11/15/71)
P.O. Box 19130
Green Bay, Wisconsin 54307-9130
- 499 Holmatic Inc. (3/19/87)
6691 Jimmy Carter Blvd.

- Norcross, Georgia 30071
- 343 O.G. Hoyer, Inc. (7/6/81)
(Mfg. by Alfa Hoyer, Denmark)
201 Broad St.
Lake Geneva, Wisconsin 53147
- 447 Mateer-Burt Co., Inc. (7/22/85)
(Mfg. by Trustpak, England)
436 Devon Park Drive
Wayne, Pennsylvania 19087
- 537 Osgood Industries, Inc. (7/19/88)
601 Burbank Rd.
Oldsmar, Florida 34677

24-01 Non-coil Type Batch Pasteurizers

- 158 APV Crepaco, INC. (3/24/65)
100 South CP Ave.
Lake Mills, Wisconsin 53551
- 161 Cherry-Burrell Corp. (4/5/65)
(A Unit of AMCA Int'l, Inc.)
575 E. Mill St.
Little Falls, New York 13365
- 187 DCI, Inc. (9/26/66)
P.O. Box 1227, 600 No. 54th Ave.
St. Cloud, Minnesota 56301
- 519 Feldmeier Equipment, Inc. (10/22/87)
6800 Town Line Road
P.O. Box 474
Syracuse, New York 13211
- 166 Paul Mueller Co. (4/26/65)
P.O. Box 828
Springfield, Missouri 65801

25-01 Non-coil Type Batch Processors for Milk and Milk Products

- 159 APV Crepaco, INC. (3/24/65)
100 South CP Ave.
Lake Mills, Wisconsin 53551
- 162 Cherry-Burrell Corp. (4/5/65)
(A Unit of AMCA Int'l, Inc.)
575 E. Mill St.
Little Falls, New York 13365
- 188 DCI, Inc. (9/26/66)
P.O. Box 1227, 600 No. 54th Ave.
St. Cloud, Minnesota 56301
- 167 Paul Mueller Co. (4/26/65)
P.O. Box 828
Springfield, Missouri 65801
- 564 Precision Stainless, Inc. (2/27/89)
501 N. Belcrest St.
P.O. Box 668
Springfield, Missouri 65801
- 448 Scherping Systems (8/1/85)
801 Kingsley Street
Winsted, Minnesota 55395
- 520 Stainless Fabrication, Inc. (12/8/87)
633 N. Prince Lane
Springfield, Missouri 65802
- 202 Walker Stainless Equip. Co., Inc. (9/24/68)
618 State St.
New Lisbon, Wisconsin 53950

- 26-02 Sifters for Dry Milk and Dry Milk Products**
- 173 Blaw-Knox Food & Chemical Equip. Co. (9/20/65)
P.O. Box 1041
Buffalo, New York 14240
- 363 Kason Corp. (7/28/82)
1301 East Linden Ave.
Linden, New Jersey 07036
- 430 Midwestern Industries, Inc. (10/11/84)
915 Oberlin Rd., P.O. Box 810
Massillon, Ohio 44648-0810
- 185 Rotex, Inc. (8/10/66)
1230 Knowlton St.
Cincinnati, Ohio 45223
- 172 Sweco, Inc. (9/1/65)
8029 U.S. Hwy. 25
Florence, New York 41042
- 176 Sprout-Bauer Inc. (1/4/66)
(Subsidiary of Combustion Engineering)
Muncy, Pennsylvania 17756
- 27-01 Equipment for Packaging Dry Milk and Dry Milk Products**
- 353 All-Fill, Inc. (3/2/82)
40 Great Valley Pkwy.
Malvern, Pennsylvania 19355
- 409 Mateer-Burt Co. (10/31/83)
436 Devon Park Dr.
Wayne, Pennsylvania 19087
- 476 Stone Container Corporation (7/17/86)
1881 West North Temple
Salt Lake City, Utah 84116-2097
- 497 Triangle Package Machinery Co. (2/26/87)
6655 West Diversey Ave.
Chicago, Illinois 60635
- 28-01 Flow Meters for Milk and Milk Products**
- 272 Accurate Metering Systems, Inc. (4/2/76)
1651 Wilkening Court
Schaumburg, Illinois 60173
- 253 Badger Meter, Inc. (1/2/74)
4545 W. Brown Deer Rd.
P.O. Box 23099
Milwaukee, Wisconsin 53223
- 518 Bailey Controls Company (10/16/87)
29801 Euclid Avenue
Wickliffe, Ohio 44092
- 265 Electronic Flo-Meters, Inc. (3/10/75)
P.O. Box 38269
Dallas, Texas 75238
- 359 Emerson Elec. Co. (6/11/82)
Brooks Instrument Div.
P.O. Box 450, North 301
Statesboro, Georgia 30458
- 469 Endress + Hauser, Inc. (3/3/86)
2350 Endress Place
Greenwood, Indiana 46142
- 540 EXAC Corporation (8/12/88)
6410 Via Del Oro
San Jose, California 95119
- 226 Fischer & Porter Co. (12/9/71)
County Line Rd.
Warminster, Pennsylvania 18974
- 477 Flowdata Inc. (7/31/86)
15510 Wright Bros. Drive
Dallas, Texas 75244-2137
- 506 Flow Technology, Inc. (6/17/87)
4250 East Broadway Road
Phoenix, Arizona 85040
- 224 The Foxboro Company (11/16/71)
33 Commercial Street
Foxboro, Massachusetts 02035
- 562 Great Lakes Instruments, Inc. (2/6/89)
8855 North 55th Street
Milwaukee, Wisconsin 53223
- 574 Hersey Measurement Co., Inc. (10/12/89)
150 Venture Blvd.
P.O. Box 4585
Spartanburg, South Carolina 29305
- 512 Hoffer Flow Controls, Inc. (8/17/87)
149 Highway 26
Port Monmouth, New Jersey 07758
- 474 HydriL Production (6/30/86)
Technology Division
3300 North Belt East
P.O. Box 60458
Houston, Texas 77205-0458
- 399 E. Johnson Engineering & Sales (8/3/83)
11 N. Grant St.
Hinsdale, Illinois 60521
- 475 Koltek, Inc. (7/15/86)
Div. of Alfa Laval
(Mfg. Koltek, Finland)
100 Pinnacle Way, Suite 165
Norcross, Georgia 30071
- 529 Krohne America, Inc. (5/18/88)
(Mfg. by Altometer, Holland)
One Intercontinental Way
Peabody, Massachusetts 01960
- 378 Micro Motion, Inc. (2/16/83)
7070 Winchester Circle
Boulder, Colorado 80301
- 490 Rosemount Inc. (1/8/87)
12001 Technology Dr.
Eden Prairie, Minnesota
- 493 Sarasota Automation Inc. (2/2/87)
1500 N. Washington Blvd.
Sarasota, Florida 33577
- 585 Schlumberger Industries Ltd. (12/7/89)
(Mfg. by Schlumberger, England)
11321 Richmond Ave.
Houston, Texas 77082-2615
- 550 Sparling Instruments Co., Inc. (10/26/88)
4097 N. Temple City Blvd.
P.O. Box 5988
El Monte, California 91731
- 270 Taylor Instrument (2/9/76)
Combustion Engineering, Inc.
400 West Avenue, P.O. Box 110
Rochester, New York 14692
- 535 Tulsa Fluid Measurement, Inc. (7/12/88)
P.O. Box 35159
Tulsa, Oklahoma 74153-0159

- 386 Turbo Instruments, Inc. (5/11/83)
(Mfg. by Turowerk, West Germany)
4 Washell Way
Orinda, California 94563
- 29-00 Air Eliminators for Milk and Fluid Milk Products**
- 340 Accurate Metering Systems, Inc. (6/2/81)
1651 Wilkening Court
Schaumburg, Illinois 60173
- 485 Koltek, Inc. (11/18/86)
Div. of Alfa Laval
(Mfg. by Koltek, Finland)
100 Pinnacle Way, Suite 165
Norcross, Georgia 30071
- 436 Scherping Systems (11/27/84)
801 Kingsley Street
Winsted, Minnesota 55395
- 30-01 Farm Milk Storage Tanks**
- 421 Paul Mueller Co. (4/17/84)
P.O. Box 828
Springfield, Missouri 65801
- 31-01 Scraped Surface Heat Exchangers, as Amended**
- 290 APV Crepaco, INC. (6/15/77)
100 South CP Ave.
Lake Mills, Wisconsin 53551
- 274 Alfa-Laval, Inc. (6/25/76)
Contherm Div.
P.O. Box 352, 111 Parker St.
Newburyport, Massachusetts 01950
- 323 Cherry-Burrell Corp. (7/26/79)
(A Unit of AMCA Int'l., Inc.)
2400-6th St., SW, P.O. Box 3000
Cedar Rapids, Iowa 52406
- 496 FranRica Mfg. Corp. (2/23/87)
2807 South Highway 99
Stockton, California 95202
- 361 N.V. Terlet (7/12/82)
(US Agent Manning & Lewis-NJ)
P.O. Box 62
7200 AB Zutphen
Netherlands
- 32-00 Uninsulated Tanks for Milk and Milk Products**
- 397 APV Crepaco, INC. (6/21/83)
100 South CP Ave.
Lake Mills, Wisconsin 53551
- 264 Cherry-Burrell Corp. (1/27/75)
(A Unit of AMCA Int'l., Inc.)
575 E. Mill St.
Little Falls, New York 13365
- 268 DCI, Inc. (11/21/75)
600 No. 54th Ave., P.O. Box 1227
St. Cloud, Minnesota 56301
- 354 C.E. Rogers Co. (3/3/82)
S. Hwy #65, P.O. Box 118
Mora, Minnesota 55051
- 441 Scherping Systems (3/1/85)
- 801 Kingsley St.
Winsted, Minnesota 55395
- 433 TCI-Superior (11/8/84)
611 Sugar Creek Rd.
Delavan, Wisconsin 53115-0953
- 339 Walker Stainless Equip. Co., Inc. (6/2/81)
618 State St.
New Lisbon, Wisconsin 53950
- 33-00 Polished Metal Tubing for Dairy Products**
- 310 Allegheny Bradford Corp. (7/19/78)
P.O. Box 200 Route 219 South
Bradford, Pennsylvania 16701
- 413 Azco, Inc. (12/8/83)
P.O. Box 567
Appleton, Wisconsin 54912
- 308 Rath Manufacturing Co., Inc. (6/20/78)
2505 Foster Ave.
Janesville, Wisconsin 53545
- 368 Rodger Industries Inc. (10/7/82)
(Not available in USA)
P.O. Box 186, RR1
Blenheim, Ontario
Canada NOP 1A0
- 335 Stainless Products, Inc. (12/18/80)
1649-72nd Ave., Box 169
Somers, Wisconsin 53171
- 289 Tri-Clover, Inc. (1/21/77)
9201 Wilmot Road
Kenosha, Wisconsin 53141
- 331 United Industries, Inc. (10/23/80)
1546 Henry Ave.
Beloit, Wisconsin 53511
- 35-00 Continuous Blenders**
- 578 ACT Laboratories, Inc. (11/3/89)
P.O. Box 1107
McMurray, Pennsylvania 15317
- 527 Arde Barinco, Inc. (3/15/88)
500 Walnut Street
Norwood, New Jersey 07648
- 526 Bepex Corp./Schugi (3/15/88)
(Mfg. by Lelystad, Netherlands)
333 Taft St. NE
Minneapolis, MN 55413
- 417 Cherry-Burrell (2/7/84)
Anco/Votator Division
P.O. Box 35600
Louisville, Kentucky 40232
- 464 Dairy Service Mfg., Inc. (12/12/85)
4630 W. Florissant Ave.
St. Louis, Missouri 63115
- 36-00 Colloid Mills**
- 293 Waukesha Pumps (8/25/77)
(A Unit of AMCA Int'l., Inc.)
1250 Lincoln Ave.
Waukesha, Wisconsin 53186

37-01 Liquid Pressure and Level Sensing Devices

- | | | | | | |
|-----|---|------------|--|---|-----------|
| 576 | Ametek/Mansfield & Green Division
8600 Somerset Dr.
Largo, Florida 34643 | (10/13/89) | 498 | Statham Division of Solartron Transducers
2230 Stratham Blvd.
Oxnard, California 93033 | (3/5/87) |
| 318 | Anderson Instrument Co., Inc.
R.D. #1
Fultonville, New York 12072 | (4/9/79) | 285 | Tank Mate Div/Monitor Mfg. Co.
P.O. Box AL
Elburn, Illinois 60119 | (12/7/76) |
| 481 | Computer Instruments Corp.
100 Madison Ave.
Hempstead, L.I., New York 11550 | (8/14/86) | 317 | Taylor Instrument
Combustion Engineering, Inc.
400 West Avenue
Rochester, New York 14692 | (2/26/79) |
| 405 | Drexelbrook Engineering Co.
205 Keith Valley Rd.
Horsham, Pennsylvania 19044 | (9/27/83) | 410 | Viatran Corporation
300 Industrial Drive
Grand Island, New York 14072 | (11/1/83) |
| 423 | Dynisco
Ten Oceana Way
Norwood, Massachusetts 02062 | (6/15/84) | 569 | WEISS Instruments, Inc.
(Mfg. by Nuova-Fima, Italy)
85 Bell St.
West Babylon, New York 11704 | (5/24/89) |
| 459 | Endress + Hauser, Inc.
2350 Endress Place
Greenwood, Indiana 46142 | (10/17/85) | 525 | Zantel Instrument
P.O. Box 81248
Lafayette, LA 70598 | (3/4/88) |
| 524 | Flow Technology, Inc.
4250 E. Broadway Road
Phoenix, Arizona 85040 | (1/14/88) | 38-00 Cottage Cheese Vats (In Press) | | |
| 463 | The Foxboro Company
33 Commercial Street
Foxboro, Massachusetts 02035 | (12/6/85) | 541 | Kusel Equipment Company
820 West St.
Watertown, Wisconsin 53094 | (9/16/88) |
| 557 | Honeywell, Inc.
Industrial Controls Div.
1100 Virginia Drive
Fort Washington, Pennsylvania 19034 | (12/21/88) | 385 | Stoelting, Inc.
P.O. Box 127
Kiel, Wisconsin 53042-0127 | (5/5/83) |
| 572 | ITT Conoflow
P.O. Box 768
Rt 78
St. George, South Carolina 29477 | (9/25/89) | 40-01 Bag Collectors for Dry Milk and Dry Milk Products | | |
| 396 | King Engineering Corp.
P.O. Box 1228
Ann Arbor, Michigan 48106 | (6/13/83) | 504 | General Resource Corporation
201 3rd Street South
Hopkins, Minnesota 55343 | (5/15/87) |
| 501 | Lumenite Electronic Company
2331 N. 17th Avenue
Franklin Park, Illinois 60131 | (4/27/87) | 381 | Marriott Walker Corp.
925 E. Maple Rd.
Birmingham, Michigan 48011 | (4/12/83) |
| 419 | Niro Atomizer Food & Dairy Inc.
1600 County Road F
Hudson, Wisconsin 54016 | (4/2/84) | 453 | MikroPul Corporation
10 Chatham Road
Summit, New Jersey 07901 | (9/4/85) |
| 523 | Paper Machine Components, Inc.
Miry Brook Road
Danbury, Connecticut 06810 | (1/3/88) | 456 | C. E. Rogers Company
P.O. Box 118
Mora, Minnesota 55051 | (9/25/85) |
| 554 | Par Sonics, Inc.
P.O. Box 1127
State College, Pennsylvania 16804 | (11/30/88) | | | |
| 563 | PI Components Corp.
10825 Barely Lane, Suite H
Houston, Texas 77070 | (2/13/89) | | | |
| 328 | Rosemount Inc.
12001 Technology Dr.
Eden Prairie, Minnesota | (5/22/80) | | | |
| 515 | Setra Systems, Inc.
45 Nagag Park
Acton, Massachusetts 01720 | (9/14/87) | | | |
| 583 | S.J. Controls, Inc.
2248 Obispo Ave. #203
Long Beach, California 90806 | (11/11/89) | | | |

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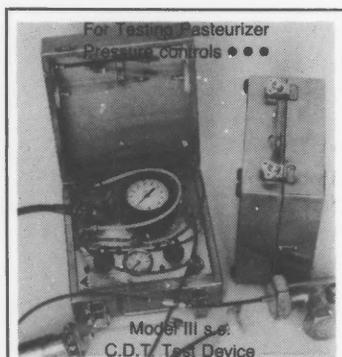
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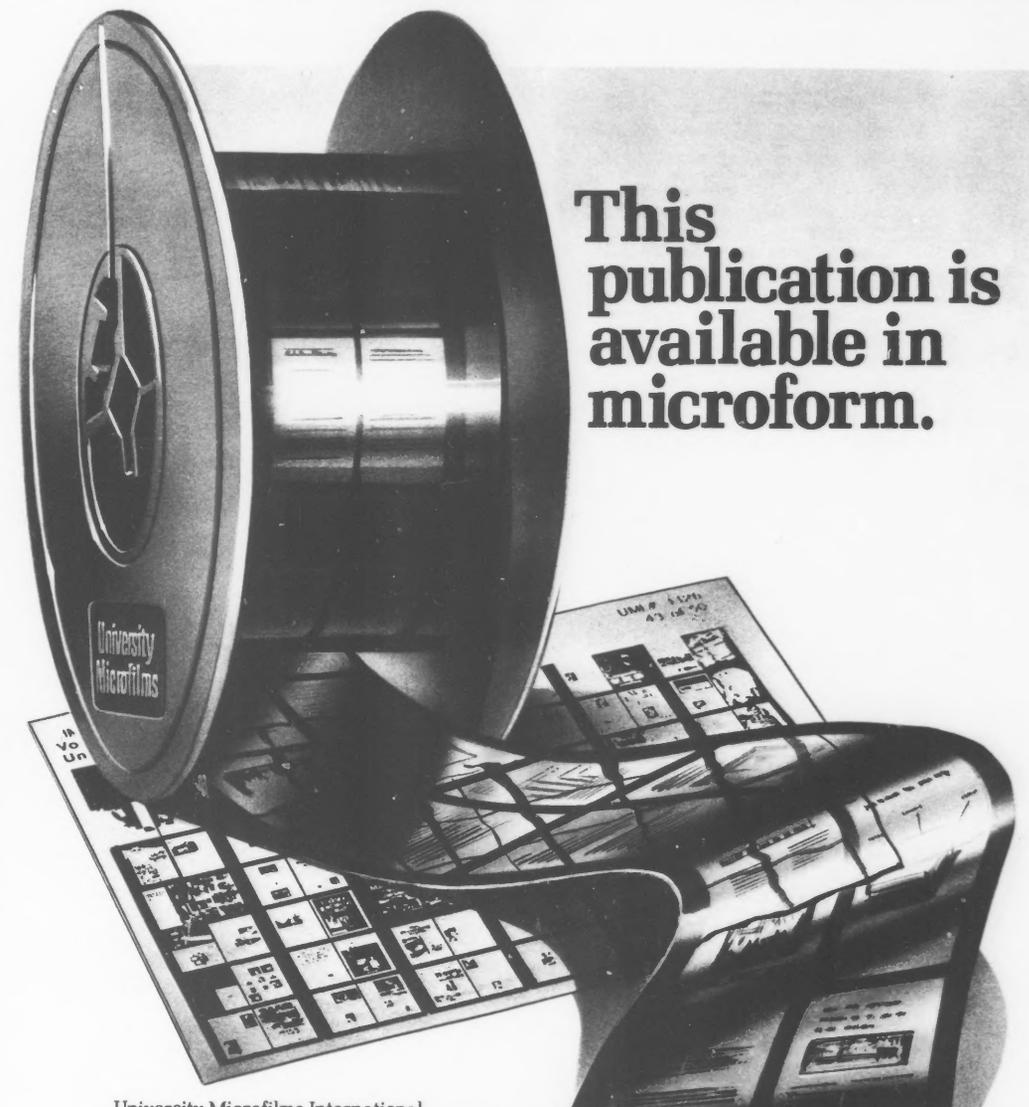
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Food & Dairy Expo '89 Exhibitors Authorized to Display the 3-A Symbol

The following is a listing of companies who appear on the list of "Holders of 3-A Symbol Council Authorization on February 15, 1990" (see pages 99-109), who were also listed as exhibitors in the Food & Dairy Expo '89 Exhibitor Directory. Food & Dairy Expo '89 was held November 11-15, 1989 in Chicago Illinois. The 3-A Standard for which the company holds 3-A Symbol Council Authorization appears in *italics*.

Accurate Metering Systems, Inc.

1651 Wilkening Court
Schaumburg, IL 60173
#08-17D, #28-01, #29-00

Albin Pump, Inc.

120 Interstate North Pkwy.
East, Suite 208
Atlanta, GA 30339-2103
#02-08

Alfa-Laval Food & Dairy Co.

Div. of Alfa-Laval, Inc.
2115 Linwood Avenue
Fort Lee, NJ 07024
#11-04

Alloy Products Corp.

1045 Perkins Avenue
P.O. Box 529
Waukesha, WI 53187
#08-17, #08-17A, #08-17E, #10-03

Anderson Instrument Co., Inc.

R.D. No. 1
Fultonville, NY 12072
#09-07, #37-01

APV Gaulin, Inc.

44 Garden St.
Everett, MA 02149
#04-03

Autoprod, Inc.

Andora Automation Division
12 South Denton Avenue
New Hyde Park, NY 11040
#17-07

B-Bar-B, Inc.

10th & McBeth Streets
P.O. Box 909
New Albany, IN 47150
#17-07

Badger Meter, Inc.

P.O. Box 591390
Tulsa, OK 74158
#08-17, #28-01

Bran & Luebbe, Inc.

1025 Busch Parkway
Buffalo Grove, IL 60015
#04-03

BS&B Safety Systems, Inc.

P.O. Box 470590
Tulsa, OK 74147-0590
#08-17G

Cesco Magnetics/Q-Controls

93 Utility Court
Rohnert Park, CA 94928
#08-17A

Cherry-Burrell

Unit of AMCA International Corp.
2400 - 6th Street, S.W.
Cedar Rapids, IA 52406
*#02-08, #04-03, #08-17, #08-17A,
#08-17C, #11-04, #17-07, #19-04,
#22-04, #31-01*

Chester-Jensen Co., Inc.

P.O. Box 908
Chester, PA 19016
#01-06, #11-04, #12-05

Combibloc, Inc.

4800 Roberts Road
Columbus, OH 43228
#17-07

Damrow Company, Inc.

196 Western Avenue
Fond Du Lac, WI 54935
#01-06, #22-04

Dayco Products, Inc.

333 W. First Street
Dayton, OH 45402
#08-17

DCl, Inc.

P.O. Box 1227
St. Cloud, MN 56302
*#01-06, #22-04, #24-01, #25-01,
#32-00*

Defontaine, Inc.

563 A. J. Allen Circle
Wales, WI 53183
#08-17A

Feldmeier Equipment, Inc.

6800 Town Line Road
Syracuse, NY 13212
#12-05, #22-04, #24-01

Flowdata, Inc.

15510 Wright Brothers Drive
Dallas, TX 75244-2137
#28-01

Fowler Products Co.

P.O. Box 1706
Athens, GA 30613-1706
#04-03

Foxboro Company

Bristol Park - 52 2L
Foxboro, MA 02035
#08-17, #09-07, #28-01, #37-01

Fristam Pumps, Inc.

2410 Parview Road
Middleton, WI 53562
#02-08

G & H Products Corp.

Alfa-Laval Group
7600 - 57th Avenue
P.O. Box 1199
Kenosha, WI 53142
#02-08, #08-17, #08-17A, #08-17F,
#12-05

GEA Food & Process Systems Corp.

8940 Route 108
Columbia, MD 21045
#08-17A, #11-04, #16-05

Girton Manufacturing Co.

P.O. Box 900
Millville, PA 17846
#12-05

Hersey Measurement Co., Inc.

150 Venture Blvd.
P.O. Box 4585
Spartanburg, SC 29305
#28-01

O. G. Hoyer A/S

13, Soren Nymarksvej
Aarhus-Hojbjerg
DK-8270
#19-04, #23-01

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4040 Del Rey Ave., Unit 9
Marina Del Rey, CA 90292
#08-17

Len E. Ivarson, Inc.

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Milwaukee, WI 53223
#02-08

King Engineering Corp.

3201 South State St.
P.O. Box 1228
Ann Arbor, MI 48106
#37-01

Kusel Equipment Co.

P.O. Box 87
Watertown, WI 53094
#11-04, #38-00

Lee Industries, Inc.

P.O. Box 688
Philipsburg, PA 16866
#08-17

Liefield & Lemke USA

Industriestr. 77
D4901 Hiddenhau
West Germany
#17-07

Liquipak International, Inc.

2285 University Ave.
St. Paul, MN 55114
#17-07

Lumaco

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Hackensack, NJ 07601
#08-17, #08-17A, #08-17F

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2331 N. 17th Ave.
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#13-08, #22-04, #24-01, #25-01,
#30-01

Niro Atomizer Food & Dairy, Inc.

1600 County Road F
Hudson, WI 54016
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#37-01

On-Line Instrumentation, Inc.

Route 376
P.O. Box 541
Hopewell Junction, NY 12533
#08-17A, #11-04

Osgood Industries

601 Burbank Road
Oldsmar, FL 34677
#23-01

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1108 Frankford Ave.
Philadelphia, PA 19125
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Peterborough, Ont K9J 6Y8
#17-07

Rath Manufacturing Co., Inc.

P.O. Box 389
Janesville, WI 53547
#33-00

Robert-James Sales

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633 N. Prince Lane
Springfield, MO 65802
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Stoelting, Inc.
502 Highway 67
P.O. Box 127
Kiel, WI 53042
#38-00

Stork Food Machinery, Inc.
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Airport Parkway
Gainesville, GA 30503
#08-17, #09-07, #12-05, #16-05

Superior Stainless
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Delavan, WI 53115
#08-17

Taylor Instrument
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Waukesha, WI 53186
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Coming Events

1990

MARCH

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

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

7-9, Bakery Maintenance Engineering, Chicago, IL. American Institute of Baking. For more information contact the Communications Department or the Registrar's Office at 1-800-633-5137, (KS, 913-537-4750), AIB, 1213 Bakers Way, Manhattan, KS 66502.

10-13, International Exposition for Food Processors (IEFP), at McCormick Place, Chicago, IL. Contact: Nancy Janssen or Cheryl Clark, (800) 331-8816.

11-12, 1990 Pittsburgh Restaurant Food & Equipment Show, sponsored by the Pennsylvania Restaurant Association. Held in Pittsburgh at the Expo Mart, Monroeville. Call 1-800-346-PROS or (717) 697-4199 for details, FAX (717) 790-9441.

12-13, Principles of Sanitation for Warehouseman, Manhattan, KS. American Institute of Baking. For more information contact the Communications Department or the Registrar's Office at 1-800-633-5137 (KS, 913-537-4750), AIB, 1213 Bakers Way, Manhattan, KS 66502.

14, Indiana Dairy Industry Conference, sponsored by the Food Science Department at Purdue University. For information contact James V. Chambers, Food Science Department, Smith Hall, Purdue University, West Lafayette, IN 47907, 317-494-8279.

18-20, Monterey Wine Festival, at the Monterey Conference Center, Monterey, CA. For more information contact The Monterey Wine Festival, c/o The National Restaurant Association, 150 N. Michigan Ave. Ste. 2000, Chicago, IL 60601, 312/853-2525, FAX 312/853-2548.

19-21, Principles of Quality Assurance, Manhattan, KS. American Institute of Baking. For more information contact the Communications Department or the Registrar's Office at 1-800-633-5137, (KS, 913-537-4750), AIB, 1213 Bakers Way, Manhattan, KS 66502.

19-22, UCD/FDA Better Process Control School, at the University of California, Davis. To enroll or obtain further information, contact: Robert Price, Dept. of Food Science & Technology, Cruess Hall, UC Davis, Davis, CA 95616; (916) 752-2194.

19-23, Scratch/Mix Operations, Manhattan, KS. American Institute of Baking. For more information contact the Communications Department or the Registrar's Office at 1-800-633-5137, (KS, 913-537-4750), AIB, 1213 Baker's Way, Manhattan, KS 66502.

19-23, Mid-West Workshop in Milk and Food Sanitation, The Ohio State University, Department of Food Science & Nutrition, 2121 Fyffe Road, Columbus, OH 43210-1097. For more information contact Dr. David Dzurec, (614) 292-7723.

26-28, Baking Production Technology, Newark, NJ. American Institute of Baking. For more information contact the Communications Department or the Registrar's Office at 1-800-633-5137, (KS, 913-537-4750), AIB, 1213 Bakers Way, Manhattan, KS 66502.

26-28, Bakery Maintenance Engineering, Newark, NJ. American Institute of Baking. For more information contact the Communications Department or the Registrar's Office at 1-800-633-5137, (KS, 913-537-4750), AIB, 1213 Bakers Way, Manhattan, KS 66502.

26-28, In-Store & Retail Baking, Newark, NJ. American Institute of Baking. For more information contact the Communications Department or the Registrar's Office at 1-800-633-5137, (KS, 913-537-4750), AIB, 1213 Bakers Way, Manhattan, KS 66502.

27-29, Western Dairy & Food Industry Conferences, University of California. For more information contact Robert Price or Pamela Tom (Food Conference), Dept. of Food Science & Technology, University of California, Davis, CA 95616, 916-752-2194, or John Bruhn or Shirley Rexroat (Dairy Conference), 916-752-2191.

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

APRIL

4, 40th Annual University of Maryland Ice Cream Conference. Contact Dr. James T. Marshall, Department of Animal Sciences, University of Maryland, College Park, Maryland 20742 (or call 301/454-7843).

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

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

10-12, Florida Association Milk Food & Environmental Sanitarians Annual Meeting, at the Hilton Hotel, Deland, Florida. For more information contact Dr. Ron Schmidt, University of Florida Food Science and Human Nutrition, Gainesville, FL 32611, 904/392-8003.

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

22-24, 1990 Philadelphia Restaurant Food & Equipment Show, sponsored by the Pennsylvania Restaurant Association. Held in Philadelphia at the Valley Forge

Convention Center, King of Prussia. Call 1-800-346-PROS or (717) 697-4199 for details, FAX (717) 790-9441.

25-26, Dairy Products Technical Conference at the O'Hare Marriott in Chicago, Illinois. Co-sponsored by The Center for Dairy Research (Madison, Wisconsin) and the American Dairy Products Institute (Chicago, Illinois). For more information contact Sarah Quinones (CDR) at 608/262-2217 or Dr. Warren S. Clark, Jr. (ADPI) at 312/782-4888.

MAY

1-2, Harrisburg Restaurant Food & Equipment Show, sponsored by the Pennsylvania Restaurant Association. Held in Harrisburg at the Farm Show Complex, Harrisburg. Call 1-800-346-PROS or (717) 697-4199 for details, FAX (717) 790-9441.

2-4, International Symposium on Annatto - Preliminary Program, Auditorium of University of Sao Paulo, Sao Paulo, Brazil. For more information contact Helena Yuco Yabiku, Instituto Adolfo Lutz, Av Dr Arnaldo 355, Caixa Postal 7027, 01246 Sao Paulo - Brazil.

7-11, Electrical Troubleshooting. American Institute of Baking, Manhattan, KS. Contact: Melinda Enns at (913) 537-4750.

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

14-17, Purdue Aseptic Processing and Packaging Workshop, sponsored by the Food Science Department at Purdue University. For information contact James V. Chambers, Food Science Department, Smith Hall, Purdue University, West Lafayette, IN 47907, 317-494-8279.

14-18, Applications and Troubleshooting Microprocessor Control Circuits Seminar, presented by The American Institute of Baking. To register, write to American Institute of Baking, 1213 Bakers Way, Manhattan, KS 66502, call 913-537-4750 or 800-633-5137, or FAX 913-537-1493.

19-23, The 71st Annual National Restaurant Association Restaurant, Hotel-Motel Show, held at McCormick Place, Chicago, IL. For more information contact National Restaurant Association, 150 N. Michigan Ave., Ste. 2000, Chicago, IL 60601, 312/853-2525, FAX 312/853-2548.

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

JUNE

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

JULY

6-7, International Symposium on Rapid Methods and Automation in Microbiology: Ten Years of Excellence. Contact Dr. Daniel Y.C. Fung, Director, 207 Call Hall, Kansas State University, Manhattan, Kansas 66506. Telephone (913) 532-5654, FAX (913) 532-7059.

6-13, International Workshop on Rapid Methods and Automation in Microbiology: Ten years of Excellence. Contact Dr. Daniel Y.C. Fung, Director, 207 Call Hall, Kansas State University, Manhattan, Kansas 66506. Telephone (913) 532-5654, FAX (913) 532-7059.

AUGUST

5-9, IAMFES 77th Annual Meeting, to be held at the Woodfield Hilton and Towers, Arlington Heights, IL. For more information contact Julie Heim, 502 E. Lincoln Way, Ames, IA 50010-6666, (800) 369-6337.

15-18, FOOD PACIFIC, 1990 will be held at Vancouver's domed stadium, B.C. Place. Those wishing to attend may obtain further information by contacting: B.C. Food Exhibitions Ltd., 190-10651 Shellbridge Way, Richmond, B.C., Canada V6X 2W8 (604) 660-2288.

26-31 Eighth International Biodeterioration and Biodegradation Symposium, University of Windsor, Ontario, Canada. For more information contact Mary M. Hawkins, Corresponding Secretary, 10657 Galaxie, Ferndale, MI 48220-2133, 313-544-0042.

SEPTEMBER

10-13, 104th Annual International Meeting & Exposition, to be held at the Clarion Hotel, New Orleans, Louisiana. For more information, contact: Margaret Ridgell, AOAC, Suite 400, 2200 Wilson Blvd., Arlington, VA 22201-3301 (703) 522-3032.

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

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

OCTOBER

7-12, Twenty-Third International Dairy Congress, sponsored by the International Dairy Federation, and **Exposition 1990**, will be held at the Montreal Convention Centre, Montreal, Canada. For further information, contact: Richard Stern, Executive Director, International Dairy Congress, 1990, PO Box 2143, Station D, Ottawa, Ontario, Canada K1P 5W3 (613) 238-4116.

IAMFES

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Executive Manager



As humans, we have a tendency to label things. White collar - blue collar, full-sized - economy-sized, pro - con, old - new, etc., etc. etc.

We also like to label periods of time. Paleozoic Era, the Dark Ages, the Bronze Age, the Atomic Age. Again, the list goes on.

They tell us that we are now in the "information" age. Everyone thirsts for information. I'm reminded of the robot (Number 5) in the movie "Short Circuit". "Number 5" watched TV until it went off the air, then went through every book in the house. From there it was to the bookstore where he read every book in the place! That's what I call "thirsting for information"!

I find our membership has a similar thirst - minus the Hollywood exaggeration, of course. As I visit our affiliates' meetings, I find that the successful ones are those who make the best and latest information available to the attendees.

Our Ontario Affiliate (Ontario Food Protection Association) is a good example of how this works. Over the last two years, their membership has nearly doubled. This growth is paralleled by their growth in attendance at their educational meetings.

They have found that to attract an audience, you have to put on outstanding programs. They have done this and it has paid off. Their November 23 meeting had the single topic "Listeria", which was viewed from a governmental and industrial perspective. It was concise, but comprehensive, and drew an enthusiastic crowd of over 150 people.

I think of the "language of sanitarians" which I have picked up since August. Nearly all of it has come from the meetings I have attended. Risk assessment at the New York State meeting; self-cleaning soft serve machines at the Illinois meeting; dairy research in Europe at the Iowa meeting; Listeria at the OFPA meeting; and Lyme Disease at the Massachusetts meeting. Fascinating presentations - all of them.

It has been said that in order for an association to survive in the 1990s, it will have to be able to provide the membership with the information it seeks.

IAMFES intends to survive!

To receive information on membership with IAMFES Circle 360 on this card

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International Association of Milk, Food and Environmental Sanitarians Inc.

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105	118	131	144	157	170	183	196	209	222	235	248	261	274	287	300	313	326	339	352
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107	120	133	146	159	172	185	198	211	224	237	250	263	276	289	302	315	328	341	354
108	121	134	147	160	173	186	199	212	225	238	251	264	277	290	303	316	329	342	355
109	122	135	148	161	174	187	200	213	226	239	252	265	278	291	304	317	330	343	356
110	123	136	149	162	175	188	201	214	227	240	253	266	279	292	305	318	331	344	357
111	124	137	150	163	176	189	202	215	228	241	254	267	280	293	306	319	332	345	358
112	125	138	151	164	177	190	203	216	229	242	255	268	281	294	307	320	333	346	359
113	126	139	152	165	178	191	204	217	230	243	256	269	282	295	308	321	334	347	360

This second Reader Service Card is provided to allow co-workers to also respond to companies of interest.

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 - ◆ ■ Penicillin N
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(hydrabamine)
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 - ◆ ■ Cloxacillin
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 - ◆ ■ Ampicillin
(trihydrate)
 - ◆ ■ Amoxicillin
(trihydrate)
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