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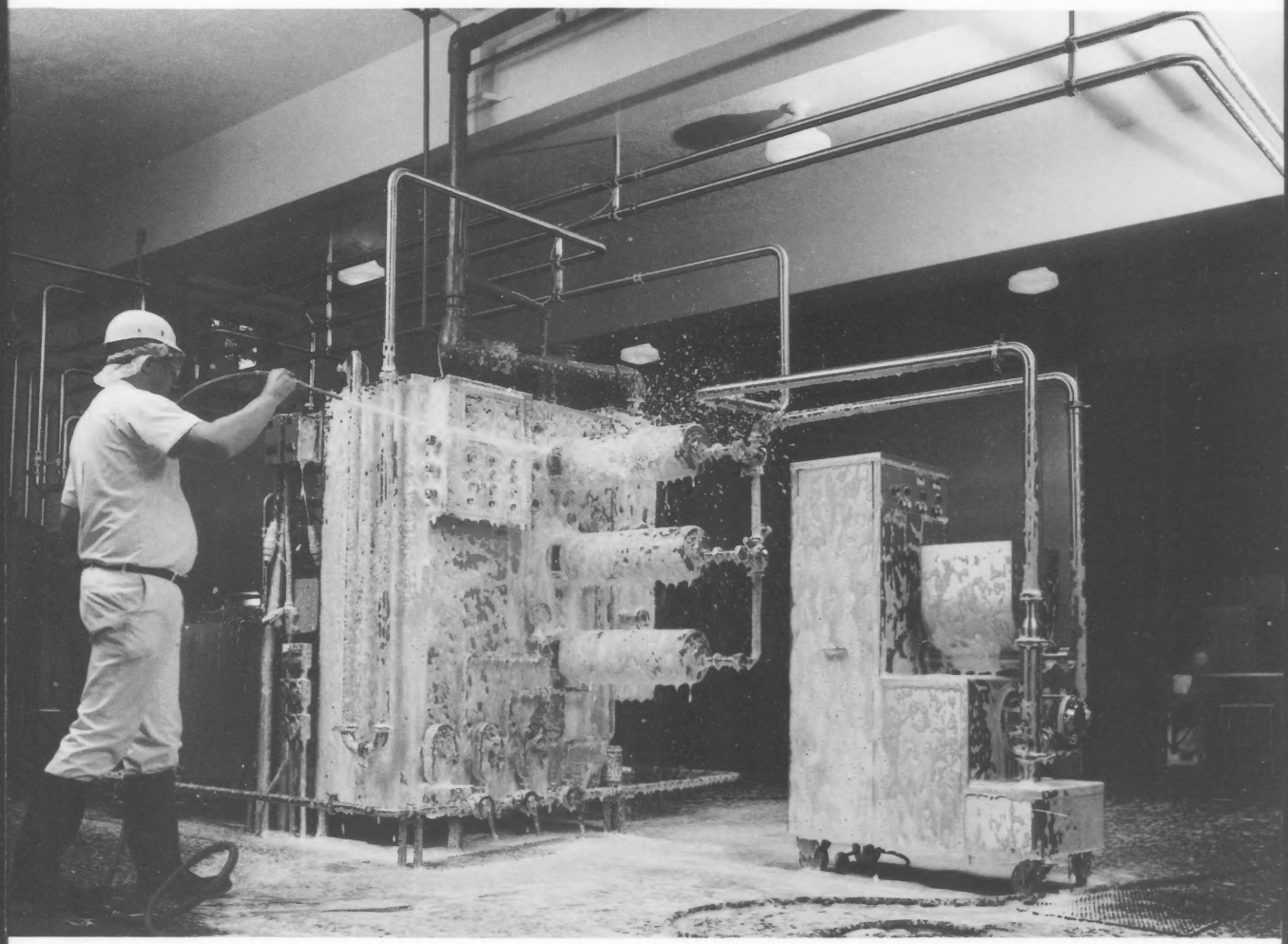
DAIRY, FOOD AND ENVIRONMENTAL

SANITATION

SEPTEMBER 1992



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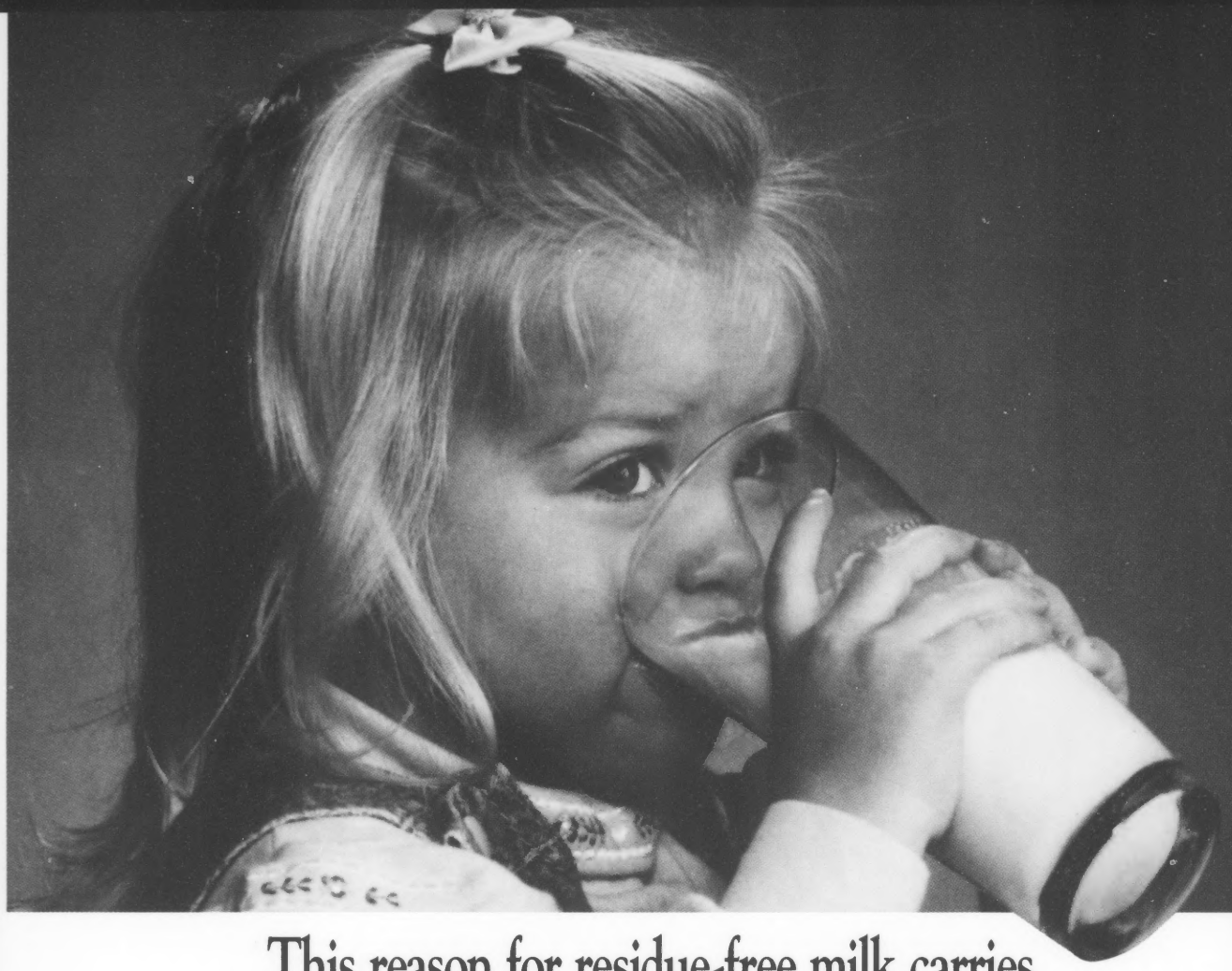

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IAMFES

Announcement
Developing Scientist Awards Competitions

(Supported by Sustaining Members)

This year IAMFES is pleased to announce extension of its program to encourage and recognize the work of students in the field of food safety research. In addition to the Oral Developing Scientist Award Competition, IAMFES introduces a Poster Presentation Award Competition.

Purpose

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

Developing Scientist Oral Competition:

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

This year the Oral Competition will be limited to ten finalists and awards will be given to the top five presenters. The papers should be approximately fifteen (15) minutes, including a 2-4 minute discussion.

Awards: First Place: $500 and an Award Plaque; Second Place: $400 and a certificate of merit; Third Place: $300 and a certificate of merit; Fourth Place: $200 and a certificate of merit; Fifth Place: $100 and a certificate of merit. All of the winners will receive a one year membership including both *Dairy, Food and Environmental Sanitation* and the *Journal of Food Protection.*

Developing Scientist Poster Competition:

The Poster Competition is open to UNDERGRADUATE and GRADUATE students enrolled at accredited universities or colleges whose research deals with problems related to environmental, food and/or dairy sanitation, protection and safety. Candidates cannot have graduated more than one (1) year prior to the deadline for submitting abstracts.

Ten finalists will be selected for the Poster Competition. The presentation must be mounted on a 8' by 4' display board (provided at the meeting) for the entire duration of the Poster Session at the Annual Meeting. The presenter must be present at their poster for a specific time, approximately two hours during the session.

Award: The winner of the Poster Session Competition will receive $300 and a one year membership including both *Dairy, Food and Environmental Sanitation* and the *Journal of Food Protection.*

Instructions to Developing Scientist Awards Competitions Entrants (Oral and Poster):

*** Note: Both a short abstract and an extended abstract must be submitted to the IAMFES office no later than December 15, 1992. No forms will be sent to entrants. Enclose two self-addressed, stamped postcards with your submitted abstracts.**

1. An original short abstract of the paper must be submitted on the blue abstract form from the September issue of IAMFES' journals. Indicate on the short abstract form whether the presentation is submitted for the Oral or Poster Competition.
2. One original and four copies of an extended abstract MUST BE SUBMITTED with the short abstract. Instructions for preparing the extended abstract follow. Attach one copy of the short abstract to each copy of the extended abstract and submit together with the original short abstract.
3. The presentation and the student must be recommended and approved for the Competition by the Major Professor or Department Head, who must sign both the short and the extended abstracts.
4. The work must represent original research done by the student and must be presented by the student.
5. Each student may enter only one (1) paper in either the Oral or Poster Competition.
6. All students will receive confirmation of acceptance of their presentations along with guidelines for preparing their Oral or Poster Presentations.
7. **All students with accepted abstracts will receive a complimentary membership which includes their choice of *Dairy, Food, and Environmental Sanitation* or the *Journal of Food Protection.***
8. Winners are announced at the Annual Awards Banquet. The ten finalists for the Oral Competition and the Poster Competition will receive complimentary tickets and are expected to be present at the Banquet.

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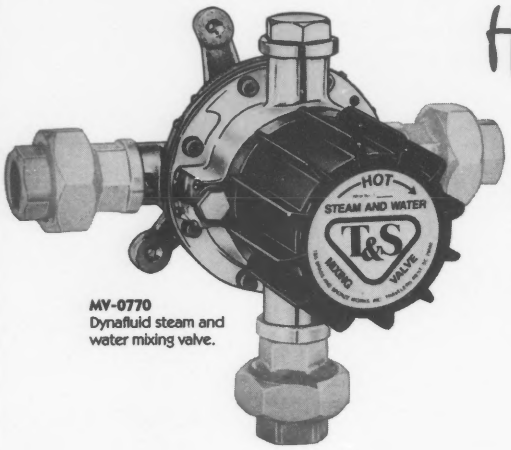

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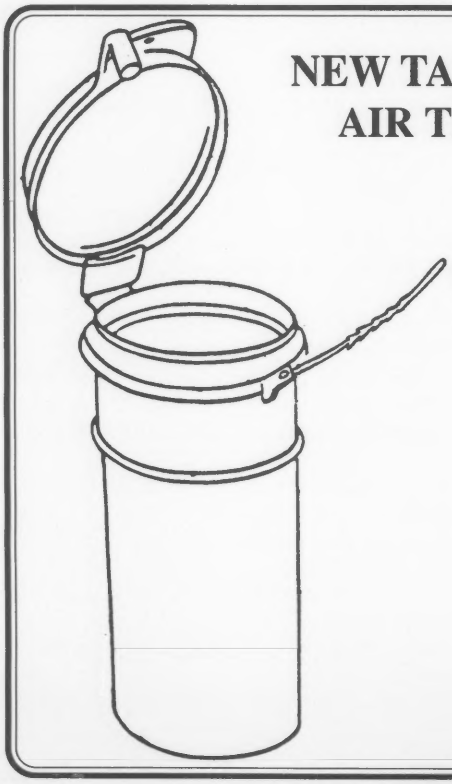

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Vol. 12 No. 10 SEPTEMBER 1992

Dairy, Food and Environmental Sanitation CONTENTS

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ABOUT THE COVER .... *Penn State University Creamery freezer operator, Todd Gantt, applies a chlorinated-alkaline foaming agent to the exterior surfaces of the Creamery's freezing equipment. The University Creamery recommends that foaming equipment exterior surfaces be an important part of a dairy processor's Environmental Sanitation Program. Photo courtesy of Penn State University.*

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On My Mind . . .

By
Steven K. Halstead, CAE
IAMFES
Executive Manager

is moving...

Since the 1992 Annual Meeting is now over (watch for a complete report in your November *Dairy, Food and Environmental Sanitation*), we are looking ahead to the next big event in the life of IAMFES—MOVING. By the time you get this, we will be in our new home—maybe even unpacked!

IAMFES moved to Ames in the 1960s from Shelbyville, Indiana. At the time, Earl Wright was on the staff at Iowa State and agreed to be the part time Executive Secretary of IAMFES. Over the years, we added staff to where we now have eight full time staff and a similar number of part timers. We have moved several times, but always in Ames. We came to our current location about seven years ago and in that time have more than doubled the amount of space taken up by our offices.

Over a year ago, we began looking to relocate. Our lease was up in June, 1992 and we knew that it would take a while to figure out what we wanted and even longer to find it. In January of this year, we got real serious and began looking at various locations.

We looked at many places in Ames and Des Moines—some that we could afford, we didn't want, and some we wanted, we couldn't afford. In the end, there just wasn't anything in Ames that met our needs, but we found a place that we wanted and could afford on the north side of Des Moines.

For those of you who are not acquainted with Iowa, Des Moines (the state capitol) is located some thirty miles south of Ames on Interstate 35. Its an easy drive through beautifully rolling countryside. Its not like we were moving the office a long ways!

A major concern all along has been the effect the move would have on the staff. We wanted to keep the staff intact as much as possible. That will happen. In fact, we don't anticipate loosing anybody.

One person has already moved to Des Moines, two have put in bids on homes in Des Moines, and yet another is looking. Those who choose to maintain their homes in Ames will have about a thirty minute commute—its interstate all the way.

(Which brings us back to moving. I'm afraid I'm really not very good at it. I'm out of practice. When we moved to our current home, I vowed it would be the last move. That was twenty-two years ago, and we're still there!)

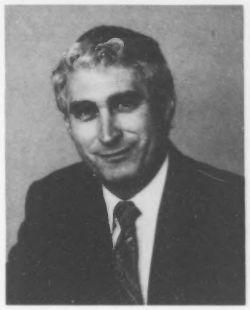
We asked five moving companies for bids. They all came out and took a look and submitted a proposal. They ranged from about $650.00 to nearly $4500.00. You figure it out 'cause I'm at a loss as to how there could be that much variance.

We have begun the packing process. Loosely translated, that means we are going through our files and shelves and getting rid of those things which we no longer need or use. Probably those things which we should have gotten rid of years ago. That is probably the best thing about moving—you clean out a lot of stuff.

We will be moving on Friday, September 11. That means that we will be out of commission on the 10th and 11th, but we should be back up and running on the 14th. We are making every effort to minimize the inconvenience to you. If we do this right, you won't even know that we did it. That's assuming you don't call us on the 11th!

They say it is time to pack this computer, so I'd better put the finishing tou

Thoughts From The President . . .



By
Michael P. Doyle
IAMFES President

Committees, Task Forces, and Professional Development Groups

The success of any professional society depends largely on the interest and involvement of its members. IAMFES is fortunate to have a wealth of vibrant and enthusiastic members who are interested in becoming more involved in IAMFES activities.

Some of the most important activities of IAMFES are carried out through the organization's Committees. Yet, for many of the Committees, there has been no defined procedure for rotating Committee membership or appointing Committee Chairpersons. In addition, the functions of the more than twenty Committees of IAMFES vary widely and range from performing single, short-term projects to providing advice on the use of funds of the IAMFES Foundation. Clearly, there is a need for restructuring the existing Committees.

At the IAMFES Annual Meeting, a proposal describing a new structure for Committees was considered by each existing Committee. There was general agreement that changes were needed in Committee structure and that the proposed changes should be adopted. The Executive Board acted on this recommendation and approved the proposed changes.

Most IAMFES activities will now function through one of three organization units, i.e., **Committees**, **Task Forces** and **Professional Development Groups**. **Committees** are established to address the intrinsic elements of IAMFES and the composition of each is described in the organization's By-Laws. Each Committee is under the leadership of a Chairperson who is appointed to a 1-year term by the President-Elect with Executive Board approval. The Committee Chairperson appoints Committee members with the approval of the Executive Board. **Task Forces** are established by the Executive Board to address single task projects which normally can be accomplished within 2 years. The Task Leader is appointed by the Executive Board for the duration of the assigned task, and the Executive Board designates the selection of Task Force members. **Professional Development Groups** are established by the Executive Board to address ongoing projects that promote members' professional development or further the organization's goals. The Group Director is appointed initially to a 2-year term by the President with Executive Board approval, and may be reappointed on an annual basis. Selection of Group members is at the discretion of the Group Director.

The former IAMFES Committees are now included in the following organizational groups:

Committees
Annual Meeting Program
Dairy, Food and Environmental Sanitation Management
Journal of Food Protection Management
Nominating
Teller
Past President's Advisory

Task Forces
Awards (including Developing Scientist Awards)
Constitution and By-Laws
Finance
Long-Range Planning
Sponsored Symposia

Professional Development Groups
Applied Laboratory Methods
Audio Visual Library
Baking Industry Sanitary Standards
Communicable Diseases Affecting Man
Dairy Quality and Safety
Environmental Issues in Food Safety
Food Sanitation
Sanitary Procedures

The IAMFES Foundation and Affiliate Council will be separate organizational units functioning within IAMFES under established By-Laws.

Hopefully, these changes will lead to greater involvement of the membership in IAMFES activities and affairs. The list of Task Forces and Professional Development Groups is not limited. Members having ideas of additional professional activities that IAMFES should be addressing are encouraged to share their thoughts with a member of the Executive Board.

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The Cleaning Process - Some Definitions of Terms

George H. Reed, Jr., MPH, University of Massachusetts/Amherst, Amherst, MA 01003

Recently, it was reported (3) that the State of Ohio, in analyzing local health departments' inspection reports, found that the area of food protection and sanitation practices most neglected in food service establishments was the cleaning and sanitization of food-contact surfaces, tableware, kitchenware, and other equipment. Most other critical requirements seemed to be under control ("acceptable") in Ohio.

A number of publications (1-2,4-7) comprehensively discuss the cleaning process. Before beginning a specific cleaning task, the following factors should be considered: (5)

1. The nature of the water being used. Is it properly conditioned to make cleaning products effective and eliminate deposits of minerals?
2. The type of soil to be removed. Is the soil protein, grease, mineral or carbon? Different cleaners and/or water temperatures may be needed.
3. The corrosion resistance of the material being cleaned. What amount of friction should be used?
4. The type of cleaner being employed. Most detergents will do a satisfactory job if properly formulated and applied.
5. The condition of the soil. Is it dried, fresh, soft, or baked-on?

There are many terms used in the cleaning process. The following are some definitions that are most pertinent to a good knowledge of cleaning chemistry:

ACIDITY - The degree or measure of the amount of acid in a solution or substance; measurement can be expressed in parts per million, percentage, or pounds or grains per gallon.

ACIDS - They are chemicals which form hydrogen ions in solution giving a pH less than 7; hydrogen replaceable by a metal to form a salt; used when required to remove inorganic deposits.

ACIDS, STRONG - They are substances which release high concentrations of hydrogen ions in a solution giving a very low pH; examples, muriatic and sulfuric acids.

ACIDS, WEAK - They release moderate to low concentrations of hydrogen ions in a solution, giving a moderately low pH; examples, organic acids such as lactic, acetic, and hydroxyacetic acids.

ALKALINITY - The degree or measure of the amount of alkali in a solution or substance; measurement can be expressed as in ACIDITY above.

ALKALIES - They are chemicals which release an excess of hydroxyl ions in a solution giving a pH of greater than 7; reacts with an acid to form a salt and water; used for removal of organic deposits, such as fats and grease.

ALKALIES, STRONG - They are substances which release high concentrations of hydroyxl ions in solution giving a very high pH; examples, caustic soda (sodium hydroxide) and caustic potash (potassium hydroxide).

ALKALIES, WEAK - They release moderate to low concentrations of hydroxyl ions giving moderately high pH values; example, sodium bicarbonate.

BUFFER - Any material which moderates the intensity of an acid or alkali in solution without reducing the quantity of acidity or alkalinity.

CORROSION-RESISTANT MATERIALS - Materials are capable of maintaining their original surface characteristics under prolonged use, including the expected food contact and the normal use of cleaning compounds and sanitizing solutions.

DISINFECTION - Use of an agent, usually chemical, that will destroy all organisms capable of causing disease, but not necessarily spore forms.

DISPERSION (DEFLOCCULATION) - It is the action of breaking up of mass or flocs into fine particles, which are suspended and flushed off surfaces and equipment.

DISSOLVING - Refers to the mixing of a liquid and a solid to produce a homogeneous solution; example, alkaline lime deposits dissolved by an acid resulting in a product that is water soluble.

EASILY CLEANABLE - Surfaces must be readily accessible and made of such materials and finish and so fabricated that chemical residues may be effectively removed by the cleaning process.

EMULSIFICATION - The action of breaking up fats and oils into very small particles (microdroplets) which are uniformly mixed in a water solution, preventing the clumping or clustering of the particles; in a stable emulsion the oil particles are suspended for long periods of time; this is a mechanical action and a gentle agitation of a solution will emulsify oils in the presence of a good surfactant agent.

PEPTIZING - The physical formation of colloidal solutions from soils which may be only partially soluble; this action is similar to DISPERSION, but is particularly applicable to protein soils.

pH - This is the concentration (intensity) of hydrogen ions measured on a logarithmic scale of 0-14, with 7 being the neutral point; low numbers are acidic and the high ones are

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basic; each unit below or above 7 represents an intensity that is 10 times as great as the unit below or above.

RINSING - A condition of a solution or suspension which enables it to be flushed from a surface easily and completely; action occurs by reducing the surface tension of the water being used.

SANITIZATION - An effective bactericidal process that provides sufficient heat (hot water, steam) or concentration of chemicals (chlorine, iodophor, quaternary ammonium) for a period of time to reduce the bacterial count, including pathogens, to a safe level on *cleaned* food-contact surfaces of equipment, utensils, and dishware; implies a degree of physical cleanliness.

SAPONIFICATION - A chemical reaction (hydrolysis) of esters into acids or alcohols by the action of alkalis or acids; use of alkalis with animal or vegetable fats (oils) results in soaps; basic equation is

fats + sodium hydroxide = soap + glycerine

SEQUESTRATION - The chemical action resulting in the binding of a metal ion in solution with the formation of a soluble and stable complex; when the activity is performed to control water hardness, with formation of a typical organic ring structure, the action is termed CHELATION; commonly used agents include polyphosphates, ethylene diamine tetraacetic acid (EDTA), and nitrilo triacetic acid (NTA); their inclusion in liquid cleaning compounds and biocide formulations enhances efficiency and prevents clouding of these products.

SURFACE CLEANER - A) *Liquid* - usually a moderately alkaline product formulated for removing light soil deposits; usually contain phosphates, silicates, and wetting agents and a water miscible solvent; B) *Powdered* - usually contains sodium tripolyphosphate (a stain remover and loosener of soil particles), wetting agent, and trisodium phosphate (an alkali for removing grease).

SURFACTANT - A chemical product whose molecules are able to modify the properties of an interface, e.g. liquid/liquid, liquid/air by lowering (reducing) the surface tension, allowing water to contact all surfaces; depending on the exact chemical nature of the agent, the properties of *emulsification*, *detergency*, *wetting* and *foaming* may be exhibited in varying degrees; possesses two essential portions, one being water repellent (hydrophobic, comprising a collection of hydrocarbon groups), the other, water attractive (hydrophilic); the number and arrangement of hydrocarbon groups together with the nature and position of the hydrophilic groups determine the surface active properties; the range covering optimum detergency properties is C 12 to C 20; optimum wetting and foaming occurs at shorter chain lengths; four major types of surfactants used in detergents are: *anionic*, *cationic*, *nonionic*, and *amphoteric* (see ref. 2 for discussion of these types).

SUSPENSION - The action which keeps insoluble particles uniformly distributed in a solution, preventing them from settling and forming deposits and making it easier to flush them from equipment.

SYNERGISM - The action of another substance of negligible activity on a chemical product which improves or increases its activity; the sum of the action of two or more active ingredients mixed together is greater than the sum of their individual actions; the use of a synergist may allow the use of a product at a lower concentration and cost; example, sodium sulfate and sodium chloride have little detergent action in themselves but they improve the action of wetting agents.

WATER HARDNESS - Relates to water containing mineral constituents which form insoluble products, resulting in poor lathering of soap; principally caused by salts of calcium (Ca), magnesium (Mg), and iron (Fe).

HARDNESS, TEMPORARY- Hardness removed by heating (boiling) water; usually due to the presence of calcium and magnesium bicarbonates, which precipitate as carbonates; alkalies will also precipitate temporary hardness.

HARDNESS, PERMANENT - That which will not precipitate out of the water on heating; composed of the salts of calcium and magnesium other than the bicarbonates, such as chlorides or sulfates.

WATER SOFTENING - It is the process of removing the calcium and magnesium salts, preventing the precipitation of insoluble carbonates and hydroxides; complex phosphates may be added to detergents to form soluble calcium salts and the sequestrant, EDTA, to remove calcium from the solution; where large quantities of soft water are required, softening apparatus is employed, using a column of artificial resins or zeolites, which exchanges the calcium ions with sodium.

In summary, a cleaning compound should perform the following functions: (7)

* Emulsification of fats and oils;
* Saponification of fats and oils;
* Surfactant action, to allow penetration into soil;
* Dispersion, the breaking up of aggregate soil into small particles;
* Suspension, the keeping of insoluble particles suspended;
* Peptizing, the breaking up of proteins;
* Water softening, removal of Ca and Mg salts, using sequestering or chelating agents.

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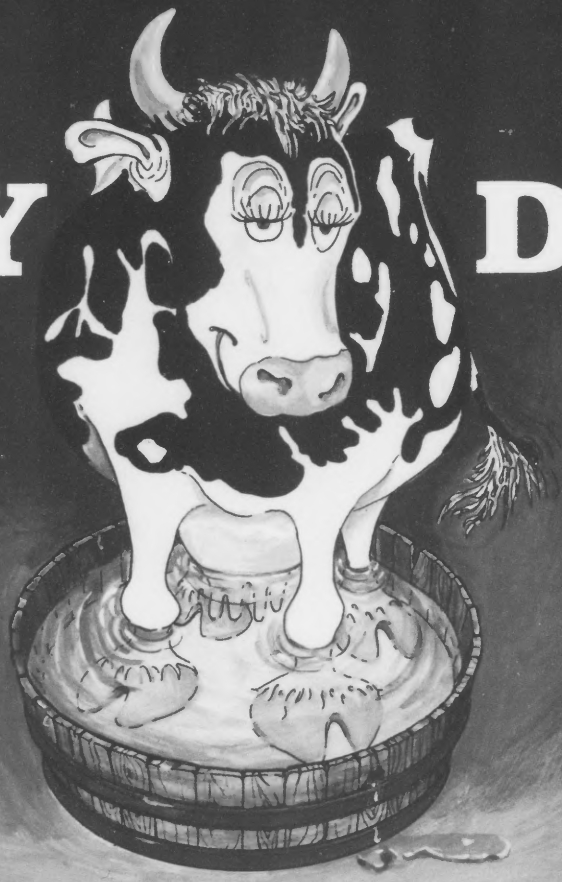

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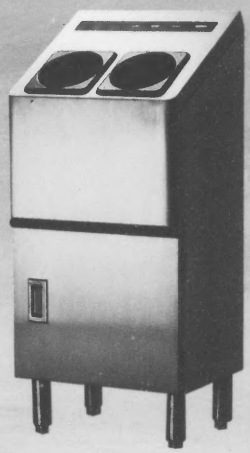

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Evaluation of Three Handwash Modalities Commonly Employed in the Food Processing Industry

Daryl S. Paulson, Ph.D.,
BioScience Laboratories, 300 North Willson, Bozeman, MT 59715

Introduction

The prevention of food contamination associated with the food processing industry rests upon a comprehensive plant-wide sanitation program, which oversees the preparation, the processing, and the packaging of food. In this study, we were interested in one facet of the overall sanitation program, that of the role played by human food handlers.

The potential for food handlers to be a source of food transmitted disease continues to be significant (Frazier & Westhoff, 1988; Harrington, 1992; Paulson, 1992). Over the years, there have been many reported instances where food handlers have been implicated as a central vector in food-borne disease (Mausner & Bahn, 1974).

Normally each hand's surface area contains approximately 3.2 x 10^5 colony forming units of endogenous microflora (Marples, 1965; Paulson, 1992). However, these population numbers have a great deal of variability which are dependent upon skin pH, skin temperature, skin humidity, and oxygen/carbon dioxide tension, as well as age and diet (Noble, 1981).

The microorganisms which typically colonize the hand surfaces do not normally pose a threat of disease epidemics transmitted from food handler to consumers. It is instead the transient microorganisms which cause most of the infectious outbreaks. This usually occurs when food handlers encounter enteric microorganisms from contact with their infected feces, the infected feces of others (usually via hand-to-hand transmission) and the feces of the animals being processed. Food handlers transmit enteric microorganisms to consumers via contact with the food they are processing. When the contaminated food is eaten by a consumer, they in turn can become infected.

While various kinds of epidemics can be transmitted via this vector, gastro-intestinal outbreaks are the most common (Joklik, et. al., 1988). Microorganism genera most clinically significant in this area include *Salmonella*, *Shigella*, *Escherichia*, *Yersinia*, *Klebsiella*, *Proteus*, *Serratia*, *Clostridium*, *Citrobacter*, *Staphylococcus*, and *Streptococcus* (Frazier & Westhoff, 1988; Joklik, et. al., 1988).

Since the cost of food-borne disease outbreaks can have serious financial and regulatory implications on the food processing industry, we conducted a study to evaluate three wash methods used to break the food contamination vector.

The methods evaluated were: 1) the manual soap and water handwash, 2) a standard iodine dip procedure, and 3) the use of the CleanTech™ automated hand cleansing system.

The manual soap and water wash has been employed in the food industry for years. It is inexpensive and easy to use by the food handlers.

The iodine dip used extensively on food processing lines has also been employed as a sanitizing agent for years. It too is inexpensive and easy to use.

However, there has been some concern in the industry about compliance to a standardized wash regimen (Mims, 1987). That is, when food handlers wash their hands. there is variability in the time spent washing, manual scrub pressure applied and amount of soap and water exchange on the hands (Paulson & Gillis, 1986; Paulson, 1988).

We were interested in evaluating a system which delivered a constant amount of pressure and a constant amount of soap and water within a pre-set control wash time. The system we chose for the application was the CleanTech™ 2000 automated hand cleansing system (Meritech, Inc.; Englewood, CO).

In using the automated hand cleansing system, food handlers simply place their hands inside openings where a proximity switch triggers the ten second wash cycle which includes both a detergent application and a rinse phase.

We designed a study patterned after the United States Food and Drug Administration's recognized Health Care Personnel Handwash test (Block, 1983; Paulson, 1988). In brief, we contaminated the hands with a known amount of recognized marker microorganisms, *S. marcescens*, a red-pigmented strain, and employed the wash procedures on human volunteers.

The *S. marcescens* marker microorganisms remaining on the hands after the wash procedure were collected via the "glove juice" technique (ASTM, 1987). A statistical evaluation of the data was conducted.

Materials and Methods

The three configurations used in this study were:

Configuration #1: Manual hand wash using: Ivory bar soap

Configuration #2: Iodine dip using: Zep-I-dine 20 (Zep, Manufacturing Company, Atlanta, GA) Lot #A12001A

Configuration #3: Automated Handwash system using: CleanTech 2000 (Meritech, Inc.; Englewood, CO) with 2% Chlorhexidine Gluconate (Meritech, Inc.; Englewood, CO)

Subjects

A sufficient number of overtly healthy subjects over the age of eighteen but under the age of seventy were admitted into the study to ensure that nine subjects completed the study. The nine subjects were randomly assigned to one of the three wash methods groups consisting of three subjects each (see Table I). Subjects were of mixed sex and age; all were free of clinically-evident dermatoses or injuries to hands or forearms. No immune compromised subjects were admitted into the study. All subjects signed informed-consent forms prior to participating in the study. An Institutional Review Board approved the study design and subject safety prior to its commencement.

TABLE I

Study Configurations

Wash Method No.	Wash Method	Product Used	Volume of Agent Used	Wash Time
1	Manual Wash	Ivory soap	N/A	5 sec.
2	Manual Dip	Iodine dip	N/A	2 sec.
3	Machine	2% Chlor-hexidine Gluconate	5 ml	10 sec.

* NOTE: Three subjects were used in each method.

Each subject performed five consecutive wash configurations. Each subject was sampled three times: a baseline sample, and after washes one and five.

Pre-Test Period

The first seven day period of this study (before the test portion of the study began) was designated the "pre-test" period. During this period, subjects avoided using medicated soaps, lotions, deodorants and shampoos; and avoided skin contact with solvents, detergents, acids and bases. Bathing in chlorinated pools and hot tubs was also avoided. This regimen allowed for the optimum stabilization of the normal microbial flora populations of the hands.

Experimental Period

The second seven day period (following the "pre-test" period) constituted the experimental period. Each subject was utilized one day of that week for a two hour period. During this period, five ml aliquots of approximately 10^{10}/ml *Serratia marcescens* (ATCC #14756, red pigmented strain) were pipetted into each subject's cupped hands. The inoculum was then distributed evenly over both hands, and the area comprising approximately one third of the forearm, via gentle massage. After a one minute air dry, the Glove Juice Sampling Procedure was performed.

The first inoculation cycle constituted the baseline sample. It was followed with the assigned test configuration procedure. The randomly assigned inoculation/wash procedure was repeated five times with a minimum of five minutes between washes. A transient microorganism count of the hands was performed following wash one and wash five, using the Glove Juice Sampling Procedure.

Product Application

Manual Washes

The Ivory soap wash was performed using the following procedure. The hands were rinsed and washed with the bar of Ivory soap. Each subject washed both the palms and backs of the hands, followed by water rinse until five seconds had lapsed. This procedure was used to assimilate the average wash time of observed employees (Block, 1983).

Iodine Dip

Both hands were dipped into the prepared iodine dip bath for two seconds. The iodine dip bath was prepared fresh on each test day according to label instructions, adding one ounce of iodine product (25 ppm) to five gallons of water, a standard formulation.

Machine Washes

All machine handwash applications were used according to a standard, ten second, pre-set wash cycle. The 5 ml volume of product dispensed was assured using a graduated cylinder to measure the solution prior to the initiation of the handwash configuration.

Glove Juice Sampling Procedure

Following the prescribed wash and rinse, non-powdered sterile surgical gloves were donned. Seventy-five (75) ml of sterile phosphate buffer (pH 7.8) aqueous solution containing 0.1% Triton X-100 was instilled into the glove. The glove was secured at the wrist and the hand massaged through the glove for sixty (60) seconds. Aliquots of the "glove juice" were removed and serially diluted in Trypticase Soy Broth (TSB) containing 1% Tween 80, 0.3% Lecithin, and 0.05% Sodium thiosulfate as neutralizing agents for the Chlorhexidine Gluconate and Iodine.

Duplicate, Trypticase Soy Agar (TSA) spread plates containing 1% Tween 80, 0.3% Lecithin, and 0.05% Sodium thiosulfate were prepared for each dilution. The plates were incubated at 30-35°C until a distinguishable red color developed. Those plates providing between twenty-five (25) and two hundred fifty (250) red pigmented colonies were utilized in this study. The number of viable red pigmented bacteria recovered was determined using the formula: aliquot volume X dilution factor X average plate count of the two (2) plates.

Contaminating Microorganism

Serratia marcescens (ATCC #14756, red-pigmented strain) microorganisms were used in order to clearly identify efficacy of the wash configurations used. A twenty-four hour culture of *Serratia marcescens* with a population of 2.2 x 10^{10} cfu[1]/ml was used in this study. Since *S. marcescens* colonies appear red, they can be clearly identified as the marker microorganism instead of normal skin flora. Any non-red colonies appearing on the agar plates were not counted. The employment of *S. marcescens* prevented biasing the results by confounding the normal and marker microorganism population counts.

Experimental Results

Each subject had both their left and right hands sampled during the baseline measurement period. The results are summarized in Table II, Column 4, "Log_{10} Baseline Values."

As previously stated, the main focus was to compare the three handwash methods (manual, dip and machine) for antimicrobial efficacy.

In order to present a non-biased log_{10} reduction value for each wash modality, the log_{10} reduction values for both the measurements collected after the first and fifth wash samples were subtracted from the baseline values of that group. Table II presents these data.

TABLE II

Raw Data Counts

Subject No.	Hand	Wash Method No.	Log_{10} Baseline Values	Log_{10} Values after Wash 1	Log_{10} reduction from baseline	Log_{10} Values after Wash 5	Log_{10} reduction from baseline
1	L	1	10.00	6.67	3.33	6.58	3.42
1	R	1	10.18	6.10	4.08	6.53	3.65
2	L	1	10.03	6.82	3.21	7.14	2.89
2	R	1	9.53	6.98	2.55	6.97	2.56
3	L	1	10.42	8.38	2.04	7.61	2.81
3	R	1	10.24	8.22	2.02	7.76	2.48
4	L	2	9.88	7.05	2.83	5.85	4.03
4	R	2	9.97	6.99	2.98	6.37	3.60
5	L	2	10.22	6.82	3.40	6.47	3.75
5	R	2	10.29	7.05	3.24	6.62	3.67
6	L	2	10.40	7.54	2.86	6.96	3.44
6	R	2	10.29	7.89	2.40	7.94	2.35
7	L	3	9.64	8.30	1.34	8.10	1.54
7	R	3	9.97	8.23	1.74	8.14	1.83
8	L	3	10.08	8.88	1.20	8.75	1.33
8	R	3	8.53	8.53	0.00	8.56	-0.03
9	L	3	10.37	8.13	2.24	8.26	2.11
9	R	3	10.29	8.06	2.23	8.45	1.84

Note that all of the plate counts were transformed to log_{10} values in order to linearize the data, a statistical requirement (Sokal & Rohlf, 1981).

The adjusted values (baseline - washes 1 and 5) were then submitted to a statistical evaluation which entailed the use of two completely randomized Analysis of Variance (ANOVA) designs (Hicks, 1982; Neter & Wasserman, 1974). The 0.05 level of statistical significance was used. The results are presented in Tables III and IV.

[1]CFU - colony forming units.

TABLE III

ANOVA Statistical Evaluation of the Log_{10} Reductions from Baseline after Wash 1

	N	MEAN	STDEV	INDIVIDUAL 95 PCT CI'S FOR MEAN BASED ON POOLED STDEV
Machine	6	2.8717	0.8130	(-------*-------)
Manual	6	2.9517	0.3500	(-------*-------)
Dip	6	1.4583	0.8359	(------*-------)
				1.60 2.40 3.20

TABLE IV

ANOVA Statistical Evaluation of the Log_{10} Reductions from Baseline after Wash 5

	N	MEAN	STDEV	INDIVIDUAL 95 PCT CI'S FOR MEAN BASED ON POOLED STDEV
Machine	6	2.9683	0.4701	(-----*----)
Manual	6	3.4733	0.5838	(-----*----)
Dip	6	1.4367	0.7673	(----*-----)
				1.0 2.0 3.0 4.0

Wash #1 Results

From the results of the statistical evaluation in Table III, it can be seen that the log_{10} reduction averages for the manual wash and the machine are statistically equivalent ($p > 0.05$). Both demonstrated log_{10} microbial reductions, after the first inoculation/wash cycle, of nearly three logs.

The iodine dip procedure demonstrated significantly less log_{10} microbial reductions than did either the manual or machine wash methods ($p < 0.05$). The iodine dip procedure did reduce the initial population by nearly 1.5 logs.

Wash #5 Results

It can be seen from Table IV that the log_{10} reduction averages for the manual wash and machine wash methods are again statistically equivalent ($p > 0.05$). Both demonstrated equal or better than a three log_{10} reduction in contaminating microorganisms.

The iodine dip procedure demonstrated, again, a significantly less log_{10} reduction in microorganisms than did either the manual or machine wash methods ($p < 0.05$).

No subject in the study complained of skin irritation from any of the three wash procedures nor was it noticed by laboratory personnel. Skin irritation potential was evaluated in terms of swelling, redness, chaffing or rash.

Discussion

Clearly, based on the results of this study, the use of either the manual or automated machine wash procedures is equivalent in antimicrobial efficacy. Both of these methods are more effective than using an iodine dip to prevent transient microorganism contamination. While an iodine dip is effective, the manual or machine wash is more so.

This is probably due to the mechanical degerming action to the skin surfaces used in both the manual and machine modes of washing but absent in the dip procedure.

Since there were only three subjects used per wash method, detecting a difference between the groups is much more difficult than when using a larger sample size. That is because committing a Type I error (α error) in statistics is considered more serious than committing a Type II (β error). Recall that a Type I error is committed when one states a significant difference exists but in fact there is no difference between the groups. A Type II error exists when one

concludes that no difference exists when one really does. Hence it is felt that the results presented are reliable. That is, the iodine dip method is less effective in antimicrobial efficacy than either the manual or machine method.

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SEAFOOD SAFETY

An Update Prepared by the National Fisheries Institute

February 1992

Questions about the safety of seafood, long regarded among the safest of animal proteins, are periodically raised in the media or before Congress. Seafood has been and continues to be a safe, wholesome and nutritious food and a valuable part of the human diet.

Food and environmental sciences are evolutionary, as are government and industry programs to assure food safety and quality. The National Fisheries Institute, the seafood industry's largest national trade association, has prepared this report on seafood safety and regulation in the United States. For additional information or copies of this Update, please contact NFI Communications 703/524-8881.

How Is Seafood Inspected?

The U.S. food supply is considered to be among the safest -- if not the safest -- in the world. We enjoy this reputation due to the vigilance and effectiveness of federal and state regulatory agencies, charged by law with protecting the public health. Fish and seafood that is bought and sold in this country must meet these tough food safety standards.

By authority of the federal Food, Drug, and Cosmetic Safety Act, the Food and Drug Administration (FDA) of the U.S. Department of Health and Human Services is primarily responsible for the regulation of fish and seafood. To this end, the FDA conducts sanitary inspections of seafood processing operations and evaluates fish handling procedures within each facility. Inspectors analyze and test the products produced in these plants for filth, decomposition and contaminants. The FDA has the authority to seize and destroy any unacceptable product, and to impose criminal penalties for improper care, handling or sanitation. The FDA is responsible for enforcing truthful labeling requirements.

Imported seafood is also overseen by the FDA, which is responsible for wharf examination and product testing. The FDA has the authority to detain, refuse entry and -- if necessary -- destroy products at the point of entry into the country.

The FDA is not the only governmental body involved in making sure that the seafood that gets to your table is safe and wholesome. The National Marine Fisheries Service (NMFS) of the U.S. Department of Commerce (USDC), the Environmental Protection Agency (EPA), and the coastal states all participate in seafood regulation programs which collectively and comprehensively monitor for seafood safety. Briefly, the responsibilities of each break down as follows:

- **Shellfish harvest waters** are monitored according to the standards set by the National Shellfish Sanitation Program, an organization of shellfish-producing state, federal and municipal officials and representatives of the shellfish industry. Testing is done by the coastal states, in co-operation with the FDA.
- **Facility inspections** are carried out by state health agencies, and by the FDA.

- **Pesticide residue tolerance levels** are set by the EPA which also monitors water conditions.
- **Voluntary inspection** and grading services are provided by NMFS, at costs of up to $150,000 annually per company. Included are the "PUFI" program (Packed Under Federal Inspection), the "Grade A" program, lot inspection and sanitation inspections of processing facilities. These programs will soon be supplemented with a joint NMFS/FDA voluntary HACCP-based (fee-paid) inspection program with a different consumer-oriented seal of compliance.

Seafood Inspection Legislation

What is the status of seafood inspection legislation? This is not a question easily answered because new legislation could be introduced in Congress at any time. In 1990, both the House of Representatives and the Senate passed bills that would have instituted a comprehensive mandatory seafood inspection program designed to expand the existing federal and state regulatory activities. This was the first time that both houses of Congress progressed so far on this issue. Unfortunately, as often happens in the political process, other issues interceded, causing seafood legislation to fall by the wayside.

In brief, the House passed a bill putting seafood inspection under the joint jurisdiction of the FDA and the National Marine Fisheries Service. The Senate bill put the program at the U.S. Department of Agriculture with meat and poultry. The budget crisis prevented Congress from reconciling the two bills. Because it was such a hot issue, new legislation was expected as soon as Congress reconvened in January 1991. Jurisdictional issues, however, remained unresolved.

Congressional committees are now considering legislation that would expand the enforcement authority of the FDA in the context of all foods. When this is settled, legislation specific to seafood could be introduced again.

While the programs of the FDA, the USDC and the states provide extensive regulation of the nation's seafood supply, the regulatory system and accompanying inspection activities are different than those provided by the U.S. Department of Agriculture for meat and poultry products. This latter system, designed primarily to prevent diseased animals from entering the food supply, is based on visual inspection of every carcass with federal inspectors present in processing plants on an essentially full-time basis.

Although there have been many studies of the seafood regulatory inspection program, none in recent years calls for a program identical to that used for meat and poultry. It is recognized that the potential health hazards from these proteins are quite different, as are the methods of bringing these foods to market. The regulatory systems for meat, poultry, and seafood must be designed to address the specific problems and practices indigenous to each food.

During the past several years, there have been calls for federal legislation to establish a more extensive regulatory inspection program for seafood. The seafood industry supports such actions. Greatly increased consumption of seafood, environmental changes, new understandings of risk and other factors require that the already extensive and effective seafood programs be continually improved to provide total assurance to the consumer that the seafood supply is safe and wholesome.

"The Food and Drug Administration and the Centers for Disease Control agree, based on estimates of acute disease occurrences, not just those reported, that on a per weight-consumed basis, fish is by far the safest source of muscle protein available."

Frank E. Young, M.D., Ph.D. Former Commissioner, FDA
Statement to Congress June 5, 1989

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A Survey of Consumer Attitudes Toward Beef Safety

Thomas R. Vosen, Extension Graduate Assistant,
William B. Mikel*, Assistant Professor,
Donald R. Mulvaney, Associate Professor,
William R. Jones, Extension Meat Scientist,
Animal and Dairy Science Department, Auburn University, Auburn, AL 36849

ABSTRACT

A mail survey was administered to 1,100 households in Alabama to determine consumer attitudes towards beef. A total of 462 surveys were returned with 53 percent of the respondents less than 45 years of age, 91 percent white, 54 percent male, 64 percent with an annual income of more than $25,000 and 67 percent with at least some college education. Average family size of respondents was three members. Consumers reported spending 3 percent of their income on beef regardless of income level or family size while 45 percent reported consuming beef at least six times in a two week period. Approximately 83 percent of all consumers felt a moderate level of concern regarding the safety of all foods they consume. Over 42 percent stated that beef was very safe versus 18 percent who expressed a higher level of concern about red meat safety than any other food groups. In addition, respondents less than 30 years of age were less concerned about the safety of foods and beef they consumed.

INTRODUCTION

The safety of foods eaten in this country has always been of concern to food producers and processors, as well as the general public. Consumer concerns about animal products center around personal health and safety, with these issues being linked to microbiological, chemical, and nutritional safety (1). However, at no time in the past has there been such an interest in food safety equal to that displayed at the present time. The advent of new technology, along with widespread media attention, have led to increased consumer awareness of an ever increasing list of possible hazards found in food. Media reports have centered on bacteria, pesticides, hormones, food additives, preservatives, food packaging, irradiation, and genetic engineering. To alleviate their concerns, consumers must apprise themselves with information about the relative safety of different types of food products.

**Address all inquiries to author Mikel at Room 209, Animal Sciences, Auburn University, Auburn, AL 36849.*

Consequently, the Alabama Cooperative Extension Service realized a need to assess the concerns of the citizens of Alabama in regard to the safety of beef. The results of this assessment will enable the Extension Service to design and implement programs that address specific beef safety concerns of Alabama consumers.

METHODS

A mail questionnaire was mailed to 1,100 households in Alabama as part of a joint effort between the Alabama Cooperative Extension Service and the Alabama Cattleman's Association to determine consumer attitudes toward the safety of beef and beef products in Alabama. A letter accompanying the questionnaire described the need for information and requested the household assist in securing such information. After one month a second questionnaire and letter was sent to those not responding to the first mailing and one month later a letter was sent to those not responding to either mailing, requesting a reply.

The questionnaire requested that consumers express their level of concern using a five level scale ranging from very concerned to unconcerned regarding: beef safety in relation to the safety of other types of food, hormones, antibiotic residues, cholesterol, bacteria, genetically engineered animals, fat, animal welfare, and animal production's effect on the environment as it relates to beef safety. The questionnaire also solicited responses to the general wholesomeness of beef, safety of organ meats, family monetary expenditures for beef products, frequency of beef consumption, and beef cookery preferences. In addition, demographic data was also included in the questionnaire regarding respondent's age, sex, race, family income, education, and family size.

Data from the returned questionnaires were subjected to statistical analysis (7). Frequencies were obtained and mean values were separated by Student-Newman-Kuels (SNK) utilizing a 95% confidence level. All answers given on partially completed questionnaires were included in the analysis of data.

RESULTS

Of the 462 respondents to the questionnaire 53 percent were less than 45 years of age, 91 percent were white, 54 percent male, 64 percent had an annual income of more than $25,000 and 67 percent had at least some college education. Average family size was three persons.

Alabama consumers reported spending 3 percent of their family income on beef and beef products regardless of family size (Table 1). In addition, age, sex, or race had no bearing on percent of family income spent on beef and beef products.

Table 1. Consumer monetary expenditures and reasons for purchasing beef.

Question	Percent
Percent of family income spent on beef.	
1%	31
3%	34
5%	19
10%	10
Other	6
Most important reason respondents purchase beef.	
Taste	65
Nutrition	23
Convenience	8
Price	4

Table 2. Consumer attitudes toward the safety of beef.

Question	Percent
Respondents level of concern regarding the safety of foods they consume.	
Unconcerned	2
Slightly concerned	15
Moderately concerned	22
Very concerned	61
% Respondents rating the following very safe.	
Beef	42
Pork	27
Poultry	16
Fish & Seafood	13
% Respondents expressing the most concern regarding the following.	
Fish & Seafood	33
Red Meat	18
Poultry	17
Vegetables	11
Eggs	9
Dairy products	6
Fruits	4
Grains	2
Perception of the inspected wholesomeness of beef.	
Wholesome	28
Not-wholesome	41
Undecided	30

Over 45 percent of respondents reported consuming beef at least six times in any given two week period. This frequency of beef consumption appears similar to that of a Good Housekeeping Institute report (3) which surveyed 200 women and found that they served red meat and poultry 4.77 times per week. Consumers 45 years of age and less were found to consume beef more frequently than consumers over 60 years of age. Moreover, males reported consuming beef more frequently than females. As would be expected, consumers with incomes of $10,000 or more consumed beef more often than those earning less than $10,000. Consumers with advanced college degrees were found to consume beef more frequently than those individuals with less than a college degree. This was possibly due to the increased earning potential of consumers with advanced degrees. Race and family size had no effect on the frequency of beef consumption.

Approximately 65 percent of the respondents indicated that taste was the main reason they purchased beef and beef products (Table 1). This is given credence by Salvage (5) who indicated that taste will always be the most important criteria in regards to consumer preference of foods. In addition, approximately 23 percent of consumers stated that nutritional considerations were the main force behind their beef purchases.

Approximately 83 percent of all respondents reported being at least moderately concerned about the safety of the foods they and their families consume (Table 2). This finding is supported by the Sandoz Agricultural Poll (6) that found 88 percent of County Agricultural Agents nationwide felt the consumers in their area were concerned about food safety. Consumers under 30 years of age were less concerned regarding the safety of the foods they and their families consumed than were respondents 30 years of age and above.

Over 42 percent of consumers stated that they believed beef was very safe versus only 18 percent who expressed a higher level of concern about red meat safety than any other food group (Table 2). Respondents less than 30 years of age tended to think that beef was more safe than did respondents over 60 years of age. In addition, male consumers surveyed stated that beef was more safe than did females. Race and income level played no role in consumer's attitudes toward the safety of beef. Even though many respondents felt beef was very safe, only 28 percent indicated that beef was inspected for wholesomeness as well as it should be (Table 2). Consumers less than 30 years of age felt beef was inspected more adequately than did respondents over 60 years of age. Furthermore, males indicated that beef was inspected for wholesomeness more thoroughly than did females. Consumers with a college degree or an advanced degree stated that beef was inspected more adequately than did respondents with less than a college degree.

Over 70 percent of respondents indicated at least a moderate level of concern regarding bacteria, cholesterol, and fat content of beef and beef products (Table 3). These

results are supported by the Food Marketing Institute's "Trends Survey" (2) that found consumers felt fat and cholesterol were the two most serious hazards involved with food. In addition, the National Live Stock and Meat Board (4) found that more than 50 percent of consumers associate fat and cholesterol with meat products. Moreover, at least 50 percent of consumers were at least moderately concerned about hormones, antibiotic residues, genetically engineered animals, animal welfare, and animal production's effect on the environment, as these topics relate to beef (Table 3).

Table 3. Consumer concerns pertaining to beef related issues.

	Level of concern	
Issue	Very or Moderately %	Somewhat, Slightly or Unconcerned %
-Bacteria	77	23
-Fat	76	24
-Cholesterol	73	27
-Antibiotic residues	66	34
-Hormones	61	39
-Animal welfare	58	42
-Genetically engineered animals	56	44
-Environmental effect of animal production	54	46

Consumers were also asked to indicate their desired degree of doneness for beef steaks, ground beef and beef roasts. While approximately 27 percent of respondents preferred beef steaks cooked to a medium-rare degree of doneness or less, 49 percent indicated a preference for a medium-well degree of doneness or higher. Consumers reported a definite preference for a higher degree of doneness regarding ground beef cookery. Approximately 73 percent of consumers prefer ground beef cooked to at least a medium-well degree of doneness. This same trend holds true for beef roasts, with 70 percent of all respondents reporting a desire for at least a medium-well degree of doneness. Age of respondents effected desired degree of doneness with a greater degree of doneness desired as respondent age increased.

Over 71 percent of all consumers reported receiving most of their information on beef safety from television and newspapers (Table 4). However, approximately 39 percent of respondents stated that the Extension Service was the most reliable source of beef safety information. Moreover, 23 percent found television most reliable and 22 percent identified federal government agencies as being the most reliable (Table 4). Consumers indicated a clear concern toward food companies with approximately 43 percent of respondents stating that they were the least reliable source of beef safety information (Table 4).

Table 4. Consumer sources of beef safety information and their perceived reliability.

Source	Information Obtained %	Most Reliable %	Least Reliable %
Television	44	23	23
Newspaper	27	10	2
Government agencies	12	22	18
Extension agent	10	39	6
Food companies	5	3	43
Radio	2	3	8

DISCUSSION

In conclusion, while expressing concern about such potential hazards as bacteria, cholesterol, and fat, consumers in Alabama find beef and beef products to generally be acceptable in regards to safety. This is shown by the responses to the questions dealing with the relative safety of beef and beef products. Also, the high number of respondents that consume beef at least six times in a two week period and the fact that the average Alabama family spends a high percentage (3 percent) of annual income on beef exemplifies consumer confidence in the safety of our beef supply. However, in general, it was found that age, gender, and level of education play an important role in consumer's perception of beef safety and their consumption of beef.

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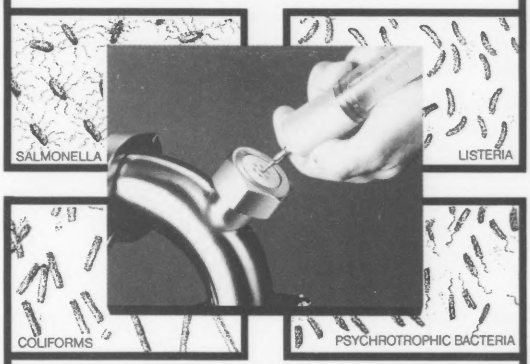

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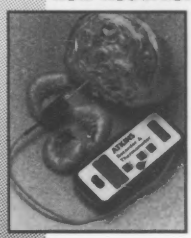

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News

IAMFES Secretary Nominations Due for 1993 Election

Nominations are now being taken for Secretary for IAMFES. This year a regulatory representative will be elected.

Once all nominations are received by the nominating committee, two persons will be chosen to run for the office. This is a five-year term, moving up yearly until he or she is President of IAMFES, then serving one year after as Past President. The term of office begins the last day of the 1993 Annual Meeting. All IAMFES Executive Board Members meet three times a year.

Two people selected are placed on the ballot. The winner is determined by majority vote of the membership through a mail vote, in the spring of 1993.

Please send a biographical sketch and photograph NO LATER THAN OCTOBER 16, 1992 to the Nominations Chairperson:

Norman Stern
USDA-ARS
P. O. Box 5677
Athens, GA 30613
(404)546-3516

M. E. Franks Scholarship Program Will Award $30,000 Worth of Scholarships in 1993

Dairy Recognition & Education Foundation (DREF), sponsors of the M. E. Franks Scholarship Program, is pleased to announce the availability of $30,000 worth of scholarships for the fall semester of 1993. Guidelines for the Scholarship criteria were approved at the June 10, 1992 Annual Meeting of DREF in Washington, DC.

The objectives of the M. E. Franks Scholarship Program are to attract capable students to careers in the dairy and food industry needs.

The Scholarship Program will provide graduate and undergraduate scholarships to students who are U.S. or Canadian citizens and are enrolled in dairy manufacturing, food science, agricultural economics, dairy marketing, and agricultural business management programs. Scholarship applications and criteria will be sent to all colleges and universities that offer programs for dairy or food majors.

At least four $3,000 scholarships will be available for undergraduates entering their junior or senior enrollment. Another two $3,000 scholarships will be available for graduate students enrolled in a masters degree program. And, most significantly, there will be $12,000 to be used for one or more graduate or undergraduate scholarship(s) at the discretion of the selection jury each year.

The Dairy Recognition & Education Foundation is a United States organization operating solely on voluntary contributions. DREF was founded as a means of strengthening the dairy industry through loans to worthy students in dairy or food science. For more information on the M. E. Franks Scholarship Program or the DREF Undergraduate Loan Program, please contact: Dairy Recognition & Education Foundation, 6245 Executive Boulevard, Rockville, Maryland 20852-3938.

USDA Food Service Manuals Updated and Expanded

The food Information Service Center (FIS) has updated and expanded the ten food service manuals initially funded by USDA's Food and Nutrition Service (FNS).

The ten manuals deal specifically with food purchasing and meal cost management, as well as "food facts," product specifications, and the storage and kitchen care of foods. One of the manuals (Volume X) also contains a "dictionary" of food terms. Each manual is updated every two years. They are useful training or reference tools for meal providers, food service managers, meal planners, and program administrators.

In aggregate the manuals consist of about 3,700 pages (370 average). They are available at moderate cost, individually or in complete sets, from the Food Information Service Center, 20105 SW 93rd Lane Road, Dunnellon, FL 34431. Telephone 904-489-8919 or (800)443-5820, Faxphone: (904)489-8919, Nita Bowne. Interested parties can write, phone or fax for a three page brochure which summarizes the scope and contents of each manual.

ADPI Publishes Ingredient Brochure

The American Dairy Products Institute, national trade association of the processed dairy products industry, announces the availability of its new publication — **"Ingredient Description Brochure - Dry Milks, Whey & Whey Products, Lactose."**

The 15-page publication provides definitions and compositional parameters for the dairy products represented by the Institute. Additional information on labeling, product applications and functionality, packaging, storage, and shipping, also is contained in this publication.

To obtain a copy of this brochure, which is useful as a guide in selecting dairy products as functional and nutritious ingredients in a broad range of food products, contact the American Dairy Products Institute, 130 N. Franklin Street, Chicago, IL 60606. Telephone: (312)782-4888; FAX (312)782-5299.

Alar, UDMH Shown Not to be Carcinogens

Tests by the cancer research arm of the World Health Organization have shown that neither Alar nor its breakdown product UDMH are carcinogens, it was reported to a scientific think tank on toxic chemicals in the environment.

Ricardo Cabral, M.D., director of the International Agency for Research on Cancer, told the Toxicology Forum that he and co-researchers fed rats both Alar and its major impurity 1,1-Dimethylhydrazine (UDMH) at extremely high levels and were unable to produce tumors.

Rats in Cabral's tests were fed 10,000 parts per million (ppm) Alar in the diets and 700 to 1,400 ppm UDMH in drinking water. Such levels amount to one percent of the total diet, and are 10,000 times higher than levels normally fed to rats in cancer studies.

Cabral undertook the studies because he initially believed Alar and UDMH to be carcinogens and wanted to prove so. However, he reported to other scientists at the Toxicology Forum that "Studies on Alar, its combination with UDMH, and UDMH alone, were negative."

Carcinogenicity of the plant growth regulator Alar, also known as daminozide, has been the subject of much discussion because of contradictory test results. A 1989 report alleging that Alar and UDMH were carcinogens resulted in a firestorm of publicity that alarmed consumers, and caused severe losses for both the fresh and processed apple industries. Alar was withdrawn from the market.

Dr. Carbral's work was done at the Department of Pathology, Nagoya City University Medical School, Nagoya, Japan, and at the WHO International Agency for Research on Cancer in Lyon, France. His co-workers were Drs. T. Hoshiya, K. Hokoi, R. Hasegawa, S. Fukushima, and N. Ito.

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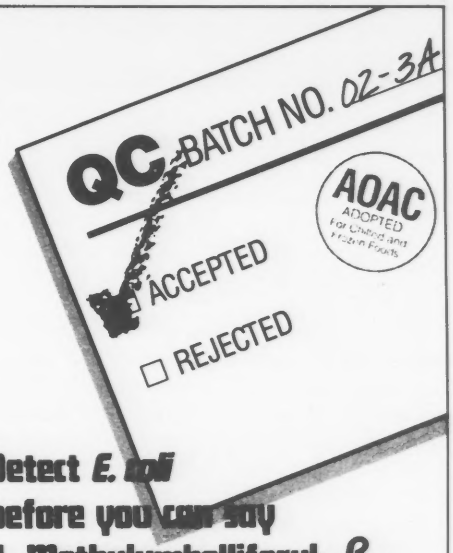

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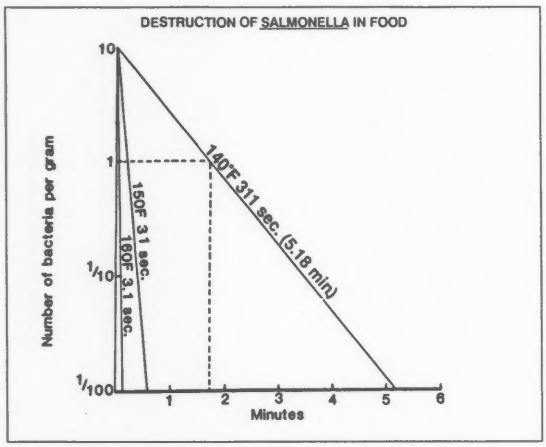
Determining the Thermal Lethality of a Process

O. Peter Snyder, Jr., Ph.D.,
Hospitality Institute of Technology and Management,
830 Transfer Road, Suite 35,
St. Paul, MN 55114

Salmonella Destruction

In a normal restaurant environment, it is probably sufficient to provide a 1,000:1, or **3D inactivation** for *Salmonella* spp. because the initial contamination level of *Salmonella* spp. is typically less than 10 per gram of food. The figure, **Destruction of *Salmonella* in Food**, shows the relationship: at 140°F, 311 seconds, or 5.18 minutes; at 150°F, 31 seconds; at 160°F, 3.1 seconds, to reduce the population from 10 to 1 per 100 grams. Since 10 organisms per gram is a common contamination level for *Salmonella* spp., if the organism is reduced to less than 1 per 100 grams of food, the food clearly will be safe for **normally healthy individuals.**



For situations that demand a more stringent standard, because immune-compromised people are being fed, a **7D inactivation** for *Salmonella* spp. should be applied: 130°F, 121 minutes; 140°F, 12.1 minutes; 150°F, 1.21 minutes; 160°F, 0.121 minute. (Brown, 1977) (Brown, 1978).

150°F, a Minimum Temperature for Immune-Compromised People

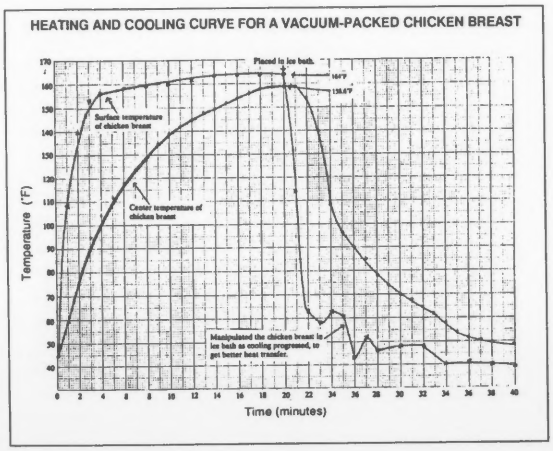
Note the interesting point that if one reduces the population from 1,000 to 1 , it is necessary to hold the food at 140°F for at least 5.18 minutes. Foods that are typically eaten rare are steak and hamburger. Both of these food items are contaminated with parasites, *Salmonella* spp., and other infective organisms. During roasting and other slow cooking processes, this time-temperature combination is easily achieved. However, during fast cooking such as grilling, griddling, or frying, it is essentially impossible to hold food at 140°F for even 5.18 minutes without it increasing in temperature. It is apparent that if these food items are not cooked to 150°F, at which temperature only 31 seconds is required, it is unlikely that there will be sufficient time to destroy common pathogenic contamination levels in these foods. This underscores the assertion that immune-compromised individuals should not eat food heated to less than 150°F, or medium rare. Food that they consume must be given a 7D pasteurization.

Heating and Cooling Curve for a Vacuum-Packed Chicken Breast

Pasteurization Heat Transfer

In a pasteurized food system, the surface and outer edges of food being cooked are heated rapidly to temperatures that inactivate viable microorganisms in these areas. It requires a longer period of time for heat transfer to raise the center temperatures of food products to those temperatures required for pasteurization. Government pasteurization standards are based on the center temperature of the product.

The graph, **Heating and Cooling Curve for a Vacuum-Packed Chicken Breast**, gives an example of the time-temperature relation of actual food center temperature of a pouch cooked in a 164°F water bath. A 5-oz. chicken breast containing a 15 percent basting solution (weight = 141.75 grams) was cooked in a hot water bath until the center temperature reached 158.6°F. It was then removed from the



hot water bath and chilled rapidly in slush ice. It is apparent from the graph that the surface temperature reached above 150°F within 2 minutes. It took approximately 19 minutes for the center of the product to reach 158.6°F. An additional 20 minutes were required to chill the product to less than 50°F.

Government Pasteurization Requirements

FDA standards for food pasteurization in all cases except for roast beef and milk provide no allowance for time at a given temperature. For example, the FDA states that chicken must be cooked to 165°F and pork to 150°F. The USDA states that chicken must be cooked to 160°F. The USDA also provides time-temperature for both pork and egg pasteurization. **Bacterial inactivation is a function of time and temperature**. In most pasteurized foods, there is a significant overkill of vegetative microorganisms if these foods have been processed to meet both FDA and USDA pasteurization standards. At any temperature above 140°F, reasonably rapid inactivation of vegetative microorganisms will take place. Hence, in the process of reaching 150°F to 160°F, and then cooling to below 40°F, there will be added lethality.

Pasteurization and Storage Stability of Hamburger Broth

Typical Pasteurization Process

In order to illustrate the point of pasteurization and storage stability, a simple hamburger broth of raw hamburger, dried onions, and milk powder was prepared. The graph, **Pasteurization and Storage Stability of Hamburger Broth**, shows the results. The initial microbiological count was more than 1,000,000 per gram. As the product was heated in a 2-quart container on top of a stove, the bottom and sides got hot relatively quickly, as would be expected.

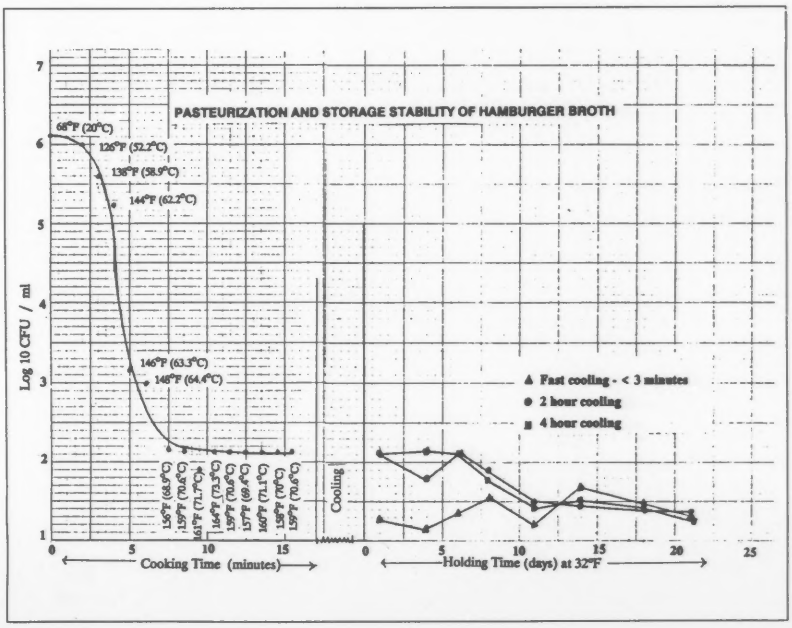
Some inactivation began almost immediately, as product flowed against the hot surfaces, even though mass average product times and temperatures were well below pasteurization at the center. For example, at 5 minutes, the broth temperature was 147.5°F, but the population had been reduced to 1,000 per ml of broth. At 7.5 minutes and 158.5°F, the population had been reduced to slightly over 100 per ml and remained at this level for the rest of the cooking time. The surviving microorganism, as might be expected, was a spore, in this case, of *Bacillus cereus*.

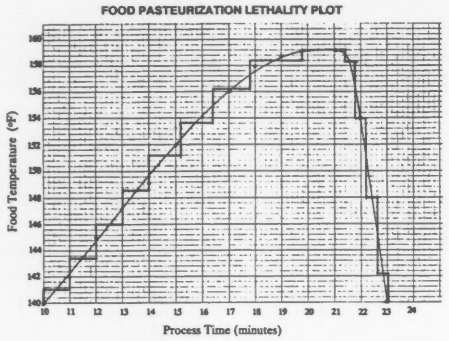
Chilled Holding

After the cooking was completed, the broth was divided into three batches. One batch was fast-cooled in less than 3 minutes; another cooled in 2 hours; and the third, in 4 hours. Microbiological counts were then taken over the following 21 days. The counts gradually decreased over time, which simply reflects a slow loss of viability of injured *Bacillus cereus* spores. These spores were probably a contaminant of the milk powder.

Total Lethality Calculation

Since lethality of *Salmonella* begins to occur reasonably rapidly above a temperature of 140°F, one can plot the center time-temperature kinetics, and calculate the **integrated total lethality** of the process. This is a standard procedure used to determine adequate process time for canned foods, whereby the goal is to heat the center of food in a can to the equivalent lethality of 250°F for 3 minutes. In terms of general food pasteurization standards, this means that the center must reach an equivalent time-temperature of 160°F for 0.121 minutes, or 7.26 seconds. The graph and table, **Food Pasteurization Lethality Plot**, show how to plot the data from the chicken cooking study, to take into account the total lethality.





T (°F)	Time *t* (sec)	(160 - T)	$10^{(160-T)/10}$	$t_1 \times 10^{(160-T)/10}$
141	60	19.0	.0126	0.755
143.4	60	16.6	.0219	1.313
146	60	14.0	.0398	2.389
148.6	60	11.4	.0724	4.347
151.2	72	8.8	.1318	9.491
153.6	72	6.4	.2291	16.494
156.2	84	3.8	.4169	35.017
158.4	120	1.6	.6918	83.020
159.2	96	.8	.8318	79.849
158.4	24	.6	.6918	16.604
154.0	24	6.0	.2512	6.029
148.0	24	12.0	.0631	1.514
142.2	24	17.8	.0166	0.398
				257.222

If a D_{160} for *Salmonella* is 1.03714 seconds, the center of this chicken breast received a *Salmonella* kill of 248 D and the surface, even more. This is a very safe process, much more than milk pasteurization.

Lethality per second is only 0.01D at 140°F. This means that if the center of a product is held at 140°F for 103.7 seconds, there would be an equivalent lethality to *Salmonella* at 160°F and 1.037 seconds. While the product used to produce the data for this graph only reached approximately 158°F for a period of about 25 seconds, the actual lethality was equivalent to 257.22 seconds at 160°F. This is equivalent to about a 248D *Salmonella* destruction, since the D value at 160°F for *Salmonella* is 1.03714 seconds (257/1.03714).

Why Overprocess?

This is a very safe product. All that is needed is a 7D destruction. Usually, food items will have no more than 10 *Salmonella* spp. per gram. Hence, with a 7D destruction, the population will be reduced to 0.000001 per gram. Because the FDA and USDA do not consider integrated lethality, except in commercially canned food sterilization and in milk and egg pasteurization, pasteurized food that is processed according to government regulations is given much more heat than is necessary. Fortunately, it does not currently effect most customer satisfaction standards because American consumers have always had to eat well cooked food to be safe. The only exception is beef. In the past, beef was less contaminated because cattle grazed on open ranges. This is not true today. More diseased animals are slaughtered due to transfer of pathogens among large herds of cattle "fattened" in enclosed feed lots. Therefore, it has become risky even to eat beef rare.

The question can be asked, "Is there a need to overprocess?" Why has the government set such extreme safety standards? One answer is that people who "process" foods have no required training in how to make food safe to eat. This includes people who cook and/or can food at home, cook food in restaurants and retail food operations, and bulk-process food. As long as there is no training and in particular, people do not know how to measure food process temperatures accurately, the best rule for meat, poultry, and fish may be "cook until the blood is gone." This equates to a food temperature of higher than 160°F. The problem with this approach is quality. Overcooking leads to tough and dry meat, poultry, and fish, and nutrient loss. Therefore, many people prefer their food cooked to lower temperatures (130°F to 150°F), at which temperatures the food's sensory properties are much more desirable.

References

Brown, W.L. 1977. Fate of *Samonella* inoculated into beef for cooking. American Bacteriological and Chemical Research Corp., Gainesville, FL.

Brown, W.L. 1978. Addendum Fate of *Salmonella* inoculated into beef for cooking. American Bacteriological and Chemical Research Corp., Gainesville, FL.

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☐ Type in the title, Capitalize the first letter of the first word and proper nouns.

☐ List the names of authors and institution(s). Capitalize first letters and initials.

☐ Give the name, title, mailing address and the office telephone number of the author who will present the paper.

☐ If the paper is to be presented by a student entered in the Developing Scientist Awards Competitions, check the box to indicate this and have the form signed by your Major Professor or Department Head.

☐ Check the most appropriate box to indicate the general subject area of the paper. Indicate subject if checking other.

Type the abstract *double-spaced*, in the space provided on the abstract form.

Mail *two* copies of the abstract before December 15, 1992 to:

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Executive Manager, IAMFES
200W Merle Hay Centre
6200 Aurora Avenue
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Enclose *two* stamped, self-addressed post cards. Two cards must be included with *each* abstract that is submitted. One will be returned to acknowledge receipt of the abstract and the other to notify the presenter of the time the paper is to be presented.

Content of the Abstract

The abstract should describe briefly: *(a)* the problem studied, *(b)* methods applied, *(c)* essential results, and *(d)* conclusions.

Presentations Format:

Papers may be presented orally or by poster format at the discretion of the Program Committee. Oral presentations will be scheduled so a speaker has a maximum of 15 minutes, including a 2-4 minute discussion. Carousel projectors for 35 mm slides will be available. **Overhead projectors are not to be used and none will be available.**

Subject Matter for Papers

Papers should report the results of applied research on: food, dairy, and environmental sanitation; foodborne pathogens; food and dairy microbiology; food and dairy engineering; food and dairy chemistry; food additives and residues; food and dairy technology; food service and food administration; quality assurance/control; mastitis; environmental health; waste management and water quality.

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The **Oral Competition** is open to GRADUATE students enrolled at accredited universities or colleges whose research deals with problems related to environmental, food and/or dairy sanitation, protection and safety. Candidates cannot have graduated more than one (1) year prior to the deadline for submitting abstracts.

This year the Oral Competition will be limited to ten finalists and awards will be given to the top five presenters. The papers should be approximately fifteen (15) minutes, including a 2-4 minute discussion.

The **Poster Competition** is open to UNDERGRADUATE and GRADUATE students enrolled at accredited universities or colleges whose research deals with problems related to environmental, food and/or dairy sanitation, protection and safety. Candidates cannot have graduated more than one (1) year prior to the deadline for submitting abstracts.

Ten finalists will be selected for the Poster Competition. The presentation must be mounted on a 8' by 4' display board (provided at the meeting) for the entire duration of the Poster Session at the Annual Meeting. The presenter must be present at their poster for a specific time, approximately two hours during the session. **(For more information on the Developing Scientist Awards Competitions, see page 605 of *Dairy, Food and Environmental Sanitation*, September Issue and the following blue pages.)**

All winners are presented and honored at the annual Awards Banquet. The ten finalists will receive complimentary tickests and are expected to be present at the Banquet.

Additional Abstract Forms

Extra copies of the abstract forms may be obtained from Steven K. Halstead, Executive Manager, or you may photo copy this one.

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Membership in IAMFES is NOT a requirement for presenting a paper at the IAMFES Annual Meeting

(OVER)

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General Subject Area

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- ☐ Food Service
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- ☐ Food Safety
- ☐ Processing
- ☐ Epidemiology
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Check the presentation format you prefer.

- ☐ Oral
- ☐ Poster
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Please type abstract, double-spaced, in the space provided here.

Selected presentations, with permission, will be recorded (audio or video).

I authorize IAMFES to record my presentation.

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Judging Criteria for Developing Scientist Awards Competitions

Judging

The abstracts and presentations will be evaluated by an independent panel of judges. Selection of ten finalists for both the Oral and Poster Competitions will be based on evaluations of the abstracts and the scientific quality of the work (see judging criteria). All entrants in the Developing Scientist Awards Competitions will be advised of the judges' decisions by March 31, 1993.

Only the ten finalists in each category will be judged upon their final presentations at the Annual Meeting and will be eligible for the final awards. All other entrants who submitted papers accepted by the IAMFES Program Committee will be expected to present their papers/posters as part of the regular Annual Meeting program.

Judging Criteria

ABSTRACTS

Short abstract: clarity, comprehensiveness, conciseness;
Extended abstract: technical merit, organization, completeness;

SCIENTIFIC QUALITY

Adequacy of experimental design;
Extent objectives were met;
Difficulty of research, depth;
Validity of conclusions based upon data;
Technical merit, contribution to science;

ORAL PRESENTATION or POSTER PRESENTATION

Organization: clarity of introduction, objectives, methods, results and conclusions;
Quality of visuals;
Quality and poise of presentation and in answering questions;

*** Note: Both a short abstract and an extended abstract must be submitted to the IAMFES office no later than December 15, 1992. No forms will be sent to entrants. Enclose two self-addressed, stamped postcards with your submitted abstracts.**

Instructions for Preparation of Extended Abstract:
Type your abstract, single-spaced, using elite (12 pitch) letter-quality type, on 8.5" x 11" pages. The margins should be as follows: Top: 1"; Bottom: 0.75"; Left: 1"; Right: 1". Do not exceed 3 pages, and DO NOT attach additional tables or graphs.

A. The first section should occupy the first fifth of the first page and read as follows:

First 3 lines or less, type:
TITLE: Capitalize only the first letter of the title and first letters of proper nouns.

Leave a blank line, then in the next 2 lines or less, type:
AUTHORS: Capitalize name of SPEAKER ONLY.

Leave a blank line then in the next 4 lines or less, type:
AFFILIATIONS: Name and complete mailing address of Affiliation.

Leave a blank line then on the next line, type:
Developing Scientist Awards Competition: Oral or Poster.

Leave a blank line then type:
Professor (or Department Head): Have your Professor or Department Head sign here.

B. Leave two blank lines then state briefly (8 lines or less):

"OBJECTIVES"
Indent the first line 5 spaces.

Leave a blank line, then describe:
"METHODS"
This should take up a maximum of three-quarters of a page; continue on page 2 if necessary. Include sufficient detail to indicate the adequacy of the experimental design and difficulty of research.

Leave a blank line then describe:
"RESULTS AND DISCUSSION"
This should take up a maximum length equivalent to 1 page; continue on page 3 if necessary. This section should indicate the extent to which objectives were met and validity of conclusions based upon data.

Leave a blank line then describe:
"SIGNIFICANT FINDINGS, CONCLUSIONS AND IMPLICATIONS"
This section should take up a maximum of 15 lines and should indicate the technical merit and contribution to science of the work.

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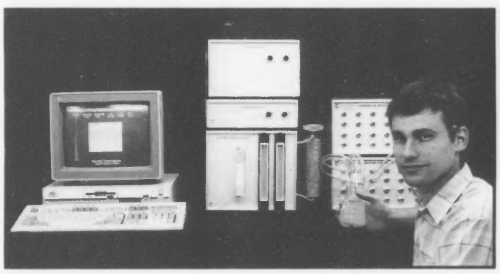

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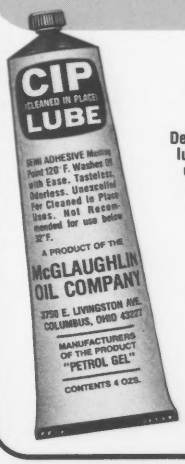

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Sanitary Design

A Mind Set

Donald J. Graham
Senior Food Technologist
Sverdrup Corporation
St. Louis, MO

This column has covered a multitude of sanitary design topics over the last year. With the basis for a sanitary design mind set already established, it is appropriate that we now focus on checklists for the evaluation of present and/or planned facilities. The next few articles will present checklists with questions designed to assist in determining needs and sanitary design criteria for a food processing facility and related equipment. They are not intended to be a complete listing, but rather for use as a tool for measuring sanitary shortcomings at a facility. They raise many questions likely to be asked by all segments of an organization, from quality control to engineering and operations, as well as regulatory agencies.

The checklists will fall under four main headings:

- General - Defining problem areas.
- Design - Existing facilities - Evaluating your facilities.
- Walls, Floors, Ceilings - Are they sanitary?
- Equipment - Is it designed to be sanitary and cleanable?

The first check list helps define major problem areas, including the largest question - is an entirely new facility required in order to produce a quality product?

In subsequent articles questions will be asked about the design of facilities: the treatment of walls, floors, ceilings and the design and maintenance of equipment, generally the worst sanitation offender in a food plant.

I suggest that this and the subsequent checklists be used to stimulate discussion during the sanitation portion of your facility planning process. Since every organization faces a unique set of quality circumstances, feel free to modify or add questions to fit your situation.

GENERAL - DEFINING PROBLEM AREAS

When defining problem areas in an existing plant, there are a number of "red flags" that can alert you to situations with potential implications for sanitation, sanitary design regulatory concerns and consumer perceptions of the quality of products from your plant or plants. Some of these "red flags" are:

1. Has the consumer complaint rate been steadily rising due to foreign materials found in your products?

   Finding foreign materials in food products is not as uncommon as it should be. Many courts and regulators have held that foreign materials, such as paint chips, nuts, bolts, wood chips, metal and many, many other items are in the product due to negligence. A company that experiences increases in these types of complaints must take a close look at sanitation, personnel practices and the overall condition of the facility. Food products containing foreign matter can be considered adulterated.

2. Did the last Food and Drug Inspection result in a long list of deficiencies on FDA form 483?

   If the last FDA inspection resulted in a list of deficiencies in sanitation and contained observations of conditions that could contribute to product contamination, be sure to analyze these comments carefully. Do the comments indicate equipment problems, facility problems or an overall sanitation problem that could be corrected by facilities renovation or improvement in procedures? Remember, the Food and Drug Act defines food as adulterated if it "...consists in whole or in part of any filthy, putrid, or decomposed substance, or if it is otherwise unfit for food, or if it has been prepared, packed or held under unsanitary conditions whereby it MAY (emphasis added) become contaminated with filth..." FDA does not have to show the product is actually contaminated, but that it has been processed under conditions that could cause contamination. These conditions could include wastewater lines over open food or food contact surfaces, chipping pain from walls, ceilings or equipment, insect infestation, rodent hair or droppings, mold, and bacterial growth to name a few.

3. Will your facility require expansion or renovation to meet long-term volume, quality goals and objectives?

New processes, new products, expanded domestic markets and new and expanding export markets all enter into the establishment of long-term objectives and goals. They also play an important role in strategic planning for overall growth of the company. Pick up any trade magazine and odds are there is an article concerning new products and new equipment designed to process them. Consumers expect new and improved products in addition to the tried and true products they are used to finding on the shelves. If plant expansions or renovations are in the plans, then the time is ideal for incorporating sanitary design criteria.

4. Does your USDA inspector continually request improvement that will require capital expenditures?

The resident inspector in meat, poultry and egg plants is continually on the lookout for conditions that are not conducive to the sanitary processing of the products under the inspector's control. The inspector keeps an updated list of the conditions that require management action for correction or improvement. That list gets placed in front of management until the conditions are corrected. Management can use this list to help justify capital fund requests for plant renovation and sanitation upgrades.

5. Does management discourage or prohibit plant visitors because they are uncomfortable with the impression the plant would make on them?

Answering yes to this question is a big "red flag" warning that all is not well with your plant facility. It is time to arrange for a thorough sanitation audit, institute sanitation and maintenance training programs and to make plans for spending capital funds to improve the facilities. Improvements will enhance management's image of the plant and boost the morale of the employees. Experience has shown that the quantity and the consistent quality of the finished products improves with upgraded and sanitary facilities.

6. Has your accident rate increased because crowded conditions result in hard-to-reach areas that require constant cleaning and maintenance?

Sufficient clearance between pieces of processing equipment not only promotes safety but also allows access for adequate sanitation. Sufficient clearance should be provided around, above and under all equipment to assure access doors open fully and allow for cleaning all surfaces inside and out. If the equipment has been shoe-horned into the process area resulting in employees getting burns from hot surfaces or having to go to extreme measures to reach inaccessible areas for scrubbing, then it is time to consider expansion, rebuilding or relocation to a bigger area. Sanitation will suffer as will maintenance. Down time will increase, and the potential for product contamination increases exponentially in crowded conditions.

7. Do your quality assurance/quality control sanitation audits continually pinpoint major sanitation deficiencies that can only be corrected by major renovation?

In-house audits are useful for discovering sanitary design deficiencies before they are found by the regulatory inspectors. This continual audit function allows management to include corrective procedures in their capital expense planning. A yes to question 7 indicates a real need for concern and active planning to correct the deficient conditions.

8. Are you planning to produce new products that will require a more sophisticated sanitary environment?

Today's consumer food products are becoming more and more sophisticated and so are the processes needed to produce them. The days of putting products in tin cans and pressure retorting them until they are commercially sterile are giving way to processing methods that are much less forgiving in terms of spoilage. A good example is the relatively new sous vide or partially processed refrigerated product now on the market. The processing of this type product, which is either partially cooked and packaged under an inert or controlled atmosphere, requires some highly sanitary processing conditions. These conditions are approaching the "clean room" atmosphere that used to be exclusive to the pharmaceutical industry.

It is not uncommon to encounter food processes that require "class 10,000 or 100,000" processing and/or filling areas.

This trend toward less processed, "fresher" product is not only effecting the primary processor but the ingredient suppliers as well. They, too, must supply products to the processor that have minimal bacterial counts, sometimes approaching zero. Many of these same ingredients suppliers have been operating their facilities as a chemical plant and are now working very hard to upgrade their facilities from a sanitary design standpoint to meet the ever increasing standards being imposed by their industrial food customers. A yes to this question really entails planning and criteria establishment for present as well as future products.

If the answers to all or the majority of the eight questions in part one of this checklist are yes, then serious review and consideration must be given to renovation of existing facilities or relocation to new facilities to keep your company viable and in the mainstream of producing sanitary, non-contaminated or non-adulterated products.

The next article will provide a checklist for design and evaluation of existing facilities.

Food and Environmental Hazards to Health

Pesticide Report

More than 97 percent of the foods produced in the United States or imported from other countries have no pesticide residues, or the levels detected are well within federally permitted limits, according to FDA's fourth annual report on the agency's pesticide monitoring programs.

The findings are based on the testing of 19,146 food samples from all 50 states and Puerto Rico, and imported foods from 92 countries. The foods included produce, grains, and dairy products. The 1990 findings are up 1 percent from the previous year's 96 percent.

The analytical methods used in the monitoring programs can detect residues of 268 pesticides. A total of 108 pesticides were actually detected in the 1990 sampling.

Among the report's key findings:

- Of 8,879 domestic products tested, 60 percent had no detectable residues, and 38 percent had residues well below legally permitted limits. The 2 percent that were in violation either had residues that exceeded tolerance levels set by the Environmental Protection Agency or residues of a pesticide not allowed on the particular food.
- Of the 10,267 imported foods tested, 64 percent had no detectable residues, nearly 32 percent had residues below the permitted limits, and 4.3 percent were in violation.

FDA Consumer/January-February, 1992.

Hazardous-Waste Sites: Priority Health Conditions and Research Strategies—United States

Uncontrolled disposal sites containing hazardous waste and other contaminants have created national environmental problems. Because of potential health problems associated with the more than 33,000 hazardous-waste sites in the United States, the Agency for Toxic Substances and Disease Registry (ATSDR)—as part of its federally legislated mandate—has developed a list of seven priority health conditions (PHCs)* to 1) assist in evaluating potential health risks to persons living near these sites and 2) determine program and applied human health research activities involving hazardous substances identified at the sites. This report summarizes the development and intended applications of the seven PHCs.

ATSDR was created by the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (as amended by the Superfund Amendments and Reauthorization Act of 1986). The mission of ATSDR is to prevent or mitigate adverse human health effects and diminished quality of life resulting from exposure to hazardous substances in the environment. Therefore, ATSDR has initiated medical-evaluation efforts and programs to address site- and substance-specific information needs. These programs include conducting public health assessments of individual hazardous-waste sites and health studies and establishing public health surveillance systems and registries of persons exposed to hazardous substances.

Since 1986, ATSDR has conducted public health assessments for more than 1200 of the nearly 1300 sites identified on the Environmental Protection Agency's National Priorities List (NPL) and has conducted more than 85 health-study activities. In addition, ATSDR has evaluated the chemicals that pose the greatest human health hazards at NPL sites; the list of 275 hazardous substances was based on 1) the frequency with which a chemical was found at NPL sites, 2) the chemical's toxicity, and 3) the likelihood of human exposure to the chemical.

ATSDR used information derived from health studies, public health assessments, and toxicologic profiles to develop a list of seven PHCs—birth defects and reproductive disorders, cancers (selected sites), immune function disorders, kidney dysfunction, liver dysfunction, lung and respiratory diseases, and neurotoxic disorders.

In addition, ATSDR determined that the following research approaches should be used to examine PHCs:

- **Evaluation of the occurrence of adverse health effects in specific populations.** This includes ecologic epidemiology studies and evaluation of the incidence or prevalence of disease; disease symptoms; self-reported health concerns; and biological markers of disease, susceptibility, or exposure.
- **Identification of risk factors for adverse health effects from exposure to hazardous-waste sites.** This includes hypothesis-generated cohort or case-control studies of potentially affected populations to identify 1) links between exposures and adverse health effects and 2) risk factors that may be mitigated by prevention actions.
- **Development of methods to diagnose adverse health effects.** This includes medical research to identify and validate new biological tests to be used to evaluate disease occurrence in potentially affected populations.
- **Diagnosis of adverse health effects in persons.** This includes clinical-based research to identify and evaluate diagnostic and treatment regimens that may benefit persons who develop adverse health effects resulting from exposure to hazardous substances.

Reported by: Div of Health Studies, Agency for Toxic Substances and Disease Registry.

Editorial Note: In the United States, approximately 2 million persons live within a 1-mile radius of the nearly 1300 hazardous-waste sites on the NPL. One national health objective for the year 2000 is to eliminate substantial health risks from NPL hazardous-waste sites through clean-up efforts that would eliminate immediate and substantial health threats, based on health assessments.

*Broad categories of diseases, disorders, or dysfunctions for which human health studies and chemical-specific research are needed.

To further evaluate health risks for exposed populations, ATSDR will use the seven PHCs to assess the occurrence of adverse health effects and the relation between effects and specific exposures to hazardous substances. In addition, the PHCs should assist public health officials in setting priorities and effectively directing national environmental public health epidemiologic research efforts. Further studies should provide critical information that can be used to reduce the burden of adverse health effects resulting from exposures to hazardous substances.

ATSDR encourages public health, medical, and university-based researchers to address these priority health conditions; the results of such research should enable health professionals to provide health information to persons exposed to hazardous substances or affected by adverse health effects. Additional information about the PHC approach is available from the Division of Health Studies, ATSDR, telephone (404) 639-6200.

MMWR 2/7/92.

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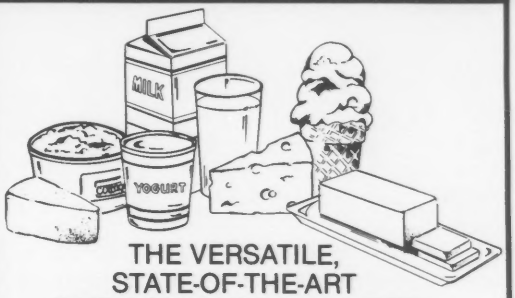

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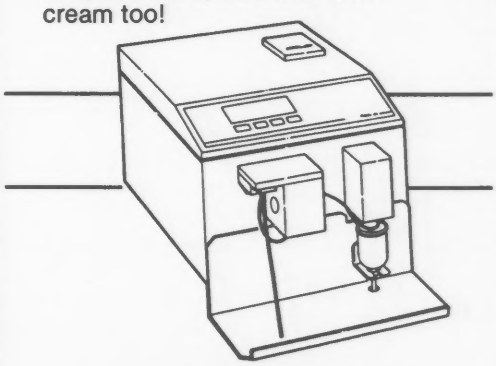

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Updates . . .

IAMFES Secretary Nominations Due for 1993 Election

Nominations are now being taken for Secretary for IAMFES. This year a regulatory representative will be elected.

Once all nominations are received by the nominating committee, two persons will be chosen to run for the office. This is a five-year term, moving up yearly until he or she is President of IAMFES, then serving one year after as Past President. The term of office begins the last day of the 1993 Annual Meeting. All IAMFES Executive Board Members meet three times a year.

Two people selected are placed on the ballot. The winner is determined by majority vote of the membership through a mail vote, in the spring of 1993.

Please send a biographical sketch and photograph NO LATER THAN OCTOBER 16, 1992 to the Nominations Chairperson:

Norman Stern
USDA-ARS
P. O. Box 5677
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(404)546-3516

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Penn State Sanitation Short Course Set for October 26-28, 1992

The Penn State Sanitation Short Course will be held on October 26-28, 1992 on the Penn State Unviersity Park Campus.

The purpose of this short course is to identify and outline state-of-the-art sanitation concepts such as Hazard Analysis Critical Control Point (HACCP), Good Manufacturing Practices (GMPs), Sanitation Engineering, Biofilms, along with a thorough briefing on classical and emerging microbiological hazards in foods. The course has been designed to assist engineers, sanitarians, quality assurance managers, health inspectors and food plant managers in designing and implementing highly effective sanitation programs. Time has been set aside for touring modern processing facilities including the Penn State Creamery and University Food Service Production Facility. In addition, informal discussions will be held on specific commodity sanitation concerns, i.e., meat and poultry, dairy, baking and confectionary products. A manual will be provided which will be a valuable future reference tool.

For more information please contact the Short Course Office, The Pennsylvania State University, 306 Ag. Adminstration Building, University Park, PA 16802; Telephone: (814)865-8301; FAX (814)865-7050.

CALL FOR PAPERS FOR THE 80TH IAMFES ANNUAL MEETING

Waverly Stouffer Hotel
Atlanta, Georgia
August 1-4, 1993

This is an invitation to all IAMFES Members to submit a paper for presentation at the 80th IAMFES Annual Meeting, to be held at the Waverly Stouffer Hotel, in Atlanta, Georgia, August 1-4, 1993. Abstract forms are published on pages 631-634 of this issue of *Dairy, Food and Environmental Sanitation.*

To receive more information on submitting a paper for presentation at the 80th IAMFES Annual Meeting, contact IAMFES at (800)369-6337 (U.S.) or (800)284-6336 (Canada) or (515)276-3344, or write IAMFES, 200W Merle Hay Centre, 6200 Aurora Avenue, Des Moines, IA 50322.

Deadline for Submission of Abstracts:
DECEMBER 15, 1992

Department of Health and Human Services

Food and Drug Administration

Certain Misbranding Sections of the Federal Food, Drug, and Cosmetic Act that are, and that are not, Adequately Being Implemented by Regulation; Notice of Proposed Lists

Agency: Food and Drug Administration, HHS.

Action: Proposed rule.

Summary: The Food and Drug Administration (FDA) is publishing, as required by the Nutrition Labeling and Education Act of 1990 (Pub. L. 101-535) (the 1990 amendments), proposed lists delineating which of six sections of the Federal Food, Drug, and Cosmetic Act (the act) that define circumstances in which a food is misbranded are adequately being implemented by FDA regulations and which are not. These six sections are: Sections 403(b) (offered for sale under the name of another food), 403(d) (misleading container), 403(f) (information of appropriate prominence), 403(h) (compliance with standard of quality and fill), 403(i)(1) (common or usual name), and 403(k) (declaration that the product contains artificial flavoring, coloring, or preservatives).

Based upon the recommendations of the National Academy of Sciences (NAS), Institute of Medicine (IOM), Food and Nutrition Board (hereinafter referred to as "the IOM"), the agency is proposing to find that all but section 403(d) of the act are being adequately implemented. These recommendations are contained in a report to FDA from IOM, entitled "Food Labeling: Toward National Uniformity." FDA contracted for this report in accordance with the 1990 amendments.

Dates: Written comments by September 28, 1992. The agency intends to issue final lists delineating which of the six sections of the act that define circumstances in which a food is misbranded are adequately being implemented by regulation by November 8, 1992, in accordance with requirements of the 1990 amendments. FDA also intends to issue by the November 8, 1992, deadline any proposed revisions to its regulations that are necessary because of a conclusion that FDA is not adequately implementing one of the sections in question, as required by section 6(b)(3)(C) of the 1990 amendments.

Addresses: Submit written comments to the Dockets Management Branch (HFA-305), Food and Drug Administration, Rm. 1-23, 12420 Parklawn Dr., Rockville, MD 20857.

For further information contact: Elizabeth J. Campbell, Center for Food Safety and Applied Nutrition (HFF-312), Food and Drug Administration, 200 C St. SW, Washington, DC 20204, (202)2055-5229.

Supplementary Information:

I. Background

The 1990 amendments amend the act (21 U.S.C. 321 *et seq.*) to provide, among other things, for Federal preemption of certain food standards and labeling requirements issued by a State or political subdivision of a State.

The preemption provisions are complex. Section 6(a) of the 1990 amendments adds section 403A to the act (21 U.S.C. 343-1), which groups the sections of the act that will have preemptive effect. Read in conjunction with section (10)(b)(1) of the 1990 amendments, section 403A provides that the preemptive effect of these sections of the act will be phased-in on a group-by-group basis.

Section 403A (a)(3) of the act states that "no State or political subdivision of a State may directly or indirectly establish under any authority, or continue in effect as to any food in interstate commerce***any requirement for the labeling of food of the type required by section 403(b), 403(d), 403(f), 403(h), 403(i)(1), or 403(k) that is not identical to the requirements of such section ***." The six provisions listed in section 403A(a)(3) of the act do not become preemptive, however, until FDA determines (as prescribed in section 6(b) of the 1990 amendments) that each is being adequately implemented by Federal regulations (see section 403A(a) of the act and section 10(b)(1)(C) of the 1990 amendments).

In accordance with section 6(b) of the 1990 amendments, FDA entered into a contract with NAS under which the IOM was to study the adequacy of the implementation of the Federal, State, or local requirements addressed in section 403A(a)(3) of the act. The IOM formed a committee to do much of its work under the contract. To facilitate this study, FDA announced in the **Federal Register** of May 8, 1991 (56 FR 21388), that the IOM would hold a public meeting at NAS on May 30, 1991, to solicit information and comments pertaining to current State and local laws and regulations that require the labeling of food that is the type required by sections 403(b), 403(d), 403(f), 403(h), 403(i)(1), and 403(k) of the act.

The IOM was unable to schedule this public meeting before the May 8, 1991, deadline imposed by the 1990 amendments because of unforeseen circumstances. The IOM's initial meeting on this issue was held on May 29 and 30, 1991, with the second day devoted to the public meeting.

Eight oral presentations were made at the May 30, 1991, public meeting. Presentations were made by representatives of food industries, trade associations, a consumer group, and the Association of Food and Drug Officials (AFDO). The IOM also received seven written submissions from AFDO; the Texas Department of Health, Division of Food and Drugs; the Florida Department of Agriculture and Consumer Services; the National Food Processors Association; the Department of Consumer Protection for the State of Connecticut; the Center for Science in the Public Interest; and the State of New York Department of Law, on behalf of the Attorneys General of the States of California, Iowa, Minnesota, Missouri, New York, Texas, and Wisconsin.

To obtain further information on the six pertinent sections beyond that which was submitted in response to the May 30, 1991, public meeting, the IOM held several panel discussions with individuals knowledgeable about the congressional intent underlying section 6(b) of the 1990 amendments and the concerns of State and local regulators, industry, and consumers about the impact of Federal preemption. The IOM also gathered information directly from FDA, the States, and local jurisdictions.

The information collected from the public meeting, the formal comments to the public meeting notice, panel discussions, and the informal comments received by the IOM form the basis upon which the IOM developed its report and recommendations. A written transcript of the May 30, 1991, public meeting, formal comments to the public meeting notice, and the information collected by the IOM upon its own initiative, from the States, local jurisdictions, FDA, and other sources are on file at the Dockets Management Branch (address above).

At the time of its May 8, 1991, announcement of the IOM's public meeting, FDA did not expect that the delay in the completion

of the report would affect the publication by August 8, 1991, of proposed lists of the sections of the act in question that are, and that are not, adequately being implemented by regulation, as required under section 6(b)(3)(A) of the 1990 amendments. Subsequently, however, the IOM informed FDA that the magnitude and importance of the undertaking, as well as the complexity of the issues involved in the study, would further delay the completion of the study until the first part of 1992.

Citing the intent of Congress in enacting section 6(b) of the 1990 amendments and the belief that publishing the proposed lists without benefit of the IOM's report and recommendations would be inappropriate, FDA announced in the **Federal Register** of October 24, 1991 (56 FR 55130), its intention to publish in the **Federal Register** in early 1992 a proposed list determining whether or not the misbranding sections that are the subject of this rulemaking (sections 403(b), 403(d), 403(f), 403(h), 403(i)(1), and 403(k) of the act) are adequately being implemented by regulation.

On April 23, 1992, the IOM submitted to FDA the final draft manuscript of the report of its findings. This report is entitled "Food Labeling: Toward National Uniformity" (hereinafter referred to as the IOM report). The IOM report published in June 1992. Copies of the final draft manuscript and the published IOM report are on file with the Dockets Management Branch (address above). Copies of the IOM report may be purchased from the National Academy Press, 2101 Constitution Avenue, NW, Washington, DC 20418.

II. The IOM Report

A. Introduction

Consistent with section 6(b) of the 1990 amendments, the charge to the IOM was to conduct a study: (1) Of State and Local laws that require the labeling of food that is of the type required by sections 403(b), 403(d), 403(f), 403(h), 403(i)(1), and 403(k) of the act; and (2) of those sections of the act and the regulations issued by FDA to enforce them, to determine whether the sections and the regulations adequately implement the purposes of those sections. The IOM interpreted its charge broadly, and while FDA is evaluating the IOM report, the agency is in no way bound to ultimately follow any of the IOM's recommendations.

B. The Criteria for Determining Adequate Implementation

The IOM report states that it used the following criteria in determining whether the six misbranding sections under review are being adequately implemented by FDA:

(1) A definition of "adequate" as "equal to, proportionate to, or fully sufficient for a specified or implied requirement" was used as a foundation for decisions.

(2) The intent of any section and of any regulation was a consideration. The IOM also considered the effect of the use of sections 403(a)(1), 403(e), and 403(i)(2) in conjunction with the six provisions that were the subject of the study.

(3) The absence of an FDA implementing regulation did not lead to an automatic conclusion that implementation is inadequate.

(4) The level of enforcement was not a consideration in determining adequacy of implementation.

(5) The strictest requirement, whether Federal, State, or local, was not automatically recommended for adoption as the national standard.

(6) The IOM limited its study of the six sections of the act to the implementing regulations for which rulemaking had been completed and to any published advisory opinions, as defined in 21 CFR 10.85 on these sections.

(7) In reviewing State and local requirements and their relationship to the six provisions of the act under study, the IOM viewed its own jurisdiction broadly to ensure a fair, balanced review of the materials provided by State and local officials and by other interested persons.

The IOM report also states that all State requirements assembled were reviewed, evaluated, and categorized according to the following criteria:

(1) Whether an adequate Federal regulation exists on the issue.

(2) Whether the agency has not adequately implemented the act in the area of concern represented by the State requirement. On this issue, the IOM considered a State requirement's national importance and its national prominence as indicated by the frequency of attention to the issued by the States.

(3) Whether the State requirement meets a demonstrated local need.

(4) Whether the State requirement provides only economic protection to the industry, is without consumer benefit, and has no other redeeming virtue.

The IOM, in determining the adequacy of FDA's implementation of the six misbranding sections, focused its work on that which was outlined within the specific language of the 1990 amendments. In approaching the task of defining "adequate implementation," the IOM examined the Congressional Record, sought guidance from persons intimately involved in the development of section 6(b) of the 1990 amendments, considered the views of the State and local governments and industry and consumer groups, examined sources other than Federal regulations (e.g., FDA advisory opinions and compliance policy guides), and reviewed State laws and regulations as indicators of the adequacy of FDA implementation of the six misbranding sections of the act subject to the IOM's review.

The IOM then assessed the strength of the overall combined evidence gathered through its public meeting, written submissions in response to the public meeting notice, panel discussions at the meeting it held, review of the Congressional Record, requests to the States, and communications with several organizations representing food and drug officials. The IOM's conclusions as to the adequacy of FDA's implementation of the six misbranding sections subject to its review reflect the strength and preponderance of the evidence as well as the IOM's evaluation of Congress' intent in implementing section 6(b) of the 1990 amendments.

C. The IOM's Recommendations

The IOM's recommendations as to the adequacy of the six misbranding sections (sections 403(b), 403(d), 403(f), 403(h), 403(i)(1), and 403(k) under study are as follows:

Section 403(b) — The IOM perceived no major differences among the views of States, industry, and consumer groups on FDA implementation of section 403(b), which was perceived as adequate. Accordingly, the IOM concluded that section 403(b) is adequately implemented.

Section 403(d) — The IOM considered deceptive or slack filled containers a matter of national importance and concluded that the perception on the part of State officials and consumer groups that there is a problem supports that conclusion. Accordingly, the IOM concluded that section 403(d) is not adequately implemented.

Section 403(f) — The IOM concluded that FDA regulations in 21 CFR Part 101 utilize a balance of location, continuity, size, and ink color to establish standard and predictable formats for food labeling. Accordingly, the IOM concluded that section 403(f) is adequately implemented.

Section 403(h) — The IOM concluded that FDA regulations in 21 CFR 130.14 establish adequate procedures for labeling products that fail to meet standard of quality and fill of container. Rarely, the IOM noted, are products found that contain the required statements set forth under section 403(h). This is, the IOM further noted, because of both the imparted inferior connotation of a product with crepe labeling and the link with standards of identity and fill for many products. Accordingly, the IOM concluded that section 403(h) is adequately implemented.

Section 403(i)(1) — The IOM concluded that FDA regulations in 21 CFR Part 102 establish adequate procedures for the development and application of common or usual names under section 403(i)(1). Accordingly, the IOM concluded that section 403(i)(1) is adequately implemented.

Section 403(k) — The IOM concluded that FDA regulations in 21 CFR 101.22, along with the proposed regulatory changes in response to the 1990 amendments (56 FR 28592, June 21, 1991), establish or will establish adequate rules on declaration of flavors, colorings, and preservatives. Accordingly, the IOM concluded that section 403(k) is adequately implemented.

III. Proposed Lists

The agency has reviewed the IOM recommendations related to the adequacy of Federal implementation of sections 403(b), 403(d), 403(f), 403(h), 403(i)(1), and 403(k) of the act. The IOM recommended finding that all but section 403(d) (misleading container) are adequately being implemented. Based on these recommendations, FDA is proposing, in accordance with section 6(b)(3)(A) of the 1990 amendments, to find that the following sections are adequately implemented by FDA's regulations: sections 403(b), 403(f), 403(h), 403(i)(1), and 403(k) of the act. Based upon the same considerations, FDA is also proposing to find that section 403(d) of the act on misleading containers is not being adequately implemented by FDA's regulations.

The agency is publishing these proposed lists based on the recommendations of the IOM. However, because the IOM report was published late, FDA has not yet fully evaluated the IOM recommendations. Thus, the agency is publishing these proposed lists for public comment while it fully evaluates the IOM recommendations. Later, FDA will publish final lists that will be based on its complete analysis of the IOM report as well as the comments it receives on these proposed lists and other relevant information.

IV. Comments

Interested persons may, on or before September 28, 1992, submit to the Dockets Management Branch (address above) written comments regarding these proposed lists. Two copies of any comments are to be submitted, except that individuals may submit one copy. Comments are to be identified with the docket number found in brackets in the heading of this document. Received comments may be seen in the office above between 9 a.m. and 4 p.m., Monday through Friday.

In accordance with section 6(b)(3) of the 1990 amendments, FDA must issue by November 8, 1992, its final lists of the sections of the act that are, and that are not, being adequately implemented. If the agency does not issue the final lists by November 8, 1992, the 1990 amendments provide that the proposed lists shall be considered the final lists, and preemption will become effective on November 8, 1992, for those sections found to be adequately implemented in the proposed lists. The agency is advising that it will not grant any requests for extension of the comment period beyond September 28, 1992.

Under the 1990 amendments, FDA must propose revisions by November 8, 1992, and issue final revisions by May 8, 1993, to any regulations found to be inadequately implemented (section 6(b)(3) of the 1990 amendments). The preemptive effect of those sections that have not been adequately implemented will become effective on the effective date of the revisions to the regulations that were initially found to be inadequate. If the agency does not issue final revisions by May 8, 1993, the proposed revisions will be considered the final revisions under the 1990 amendments, and preemption will become effective on the effective date of the rules that, on May 8, 1993, are considered final rules.

Dated: June 18, 1992.

David A. Kessler,

Commissioner of Food and Drugs.

(FR Doc. 92-17693 Filed 7/27/92; 8:45 am)

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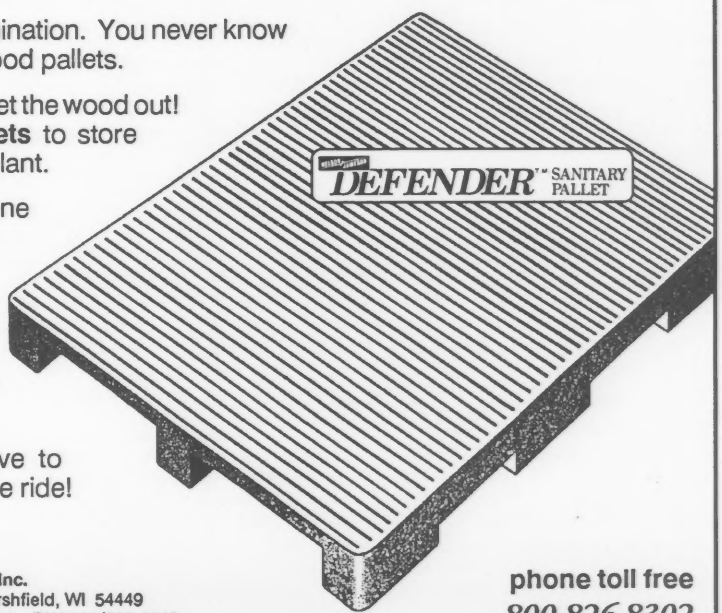

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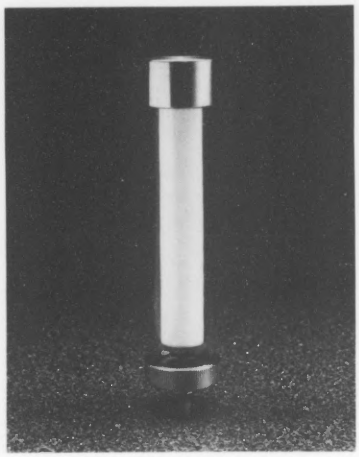

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These new filters are lower in cost than Balston's conventional stainless steel filter line. They are also more compact in design resulting in a smaller internal volume and faster sampling times.

The new improved design requires no tools to change the filters. Other design features include 1/2" NPT ports, maximum temperature of up to 400°F, and maximum pressure of up to 500 psig.

To satisfy the extremely wide range of requirements for analyzer sample filters, Balston also supplies complete lines of filter housings in teflon®, monel, and other corrosion resistant materials, plus a choice of high efficiency filter elements which are inert to virtually all liquids and gases.

All Balston products are supported by over 80 qualified sales and service engineers, and are backed by a full satisfaction guarantee. OEM pricing is available.

Balston, Inc. - Haverhill, MA

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Announcing a New Antimicrobial Test Disc for the Sensi-Disc® System: CEFMETAZOLE

Becton Dickinson Microbiology Systems announces the introduction of the CEFMETAZOLE 30 mcg susceptibility test disc to the **BBL® Sensi-Disc®** System. It joins recent Becton Dickinson Microbiology Systems additions of CEFIXIME and SPECTINOMYCIN discs, providing laboratories and physicians with the latest tools for determining antimicrobial susceptibility.

BBL® Sensi-Disc® susceptibility test discs, representing antimicrobial agents manufactured and marketed by leading pharmaceutical companies, are available in single cartridges of 50 discs and packages of ten cartridges. Each cartridge is blister-packed with a desiccant capsule to ensure optimal potency and performance in susceptibility testing. **The BBL® Sensi-Disc®** susceptibility test disc cartridges, when used in the **Sensi-Disc** 12-place self-tamping dispenser, can improve laboratory work flow by eliminating the need to individually tamp discs.

Becton Dickinson Microbiology Systems - Cockeysville, MD

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Clean-In-Place Systems from A & B

A clean-in-place (CIP) circulating system from A & B Process Systems Corp. provides automatic and thorough cleaning of vessels and pipelines. These custom-designed single or multiple tank systems reduce or eliminate the downtime associated with manual cleaning, and allow more efficient use of energy, cleaning chemicals and water. A & B can design and install CIP systems using your existing process controls, or can furnish complete, computerized, self-supporting control systems incorporating present 3-A Sanitary Standards and Accepted Practices.

A & B Process Systems Corp. - Stratford, WI

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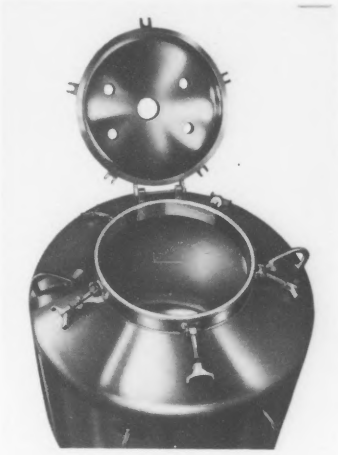

Walker Stainless Equipment Co., Inc. offers Electro-Polished Stainless Steel Tanks

To maintain ingredient or blended produet processing purity in the food, pharmaceutical, cosmetie, and healthcare industries, Walker Stainless Equipment Co., Inc. offers electro-polished stainless steel tanks.

Electro-polishing capabilities have been expanded by installation of a new 10,000 amp system, produeing a highly-polished interior tank surfaee. Suеh surfaces are contamination-free, provide improved eleanability, and corrosion resistanee.

Walker routinely electro-polishes interior stainless steel tank walls, head surfaces, fittings, and weld seams. Other related components whieh may also be electro-polished are agitators, aeeess eovers, downtubes, and C.I.P. assemblies, ete.

This Walker speeialized teehnology utilizes an aeid bath and eleetrodes, similar to electroplating. However, electro-polishing aets in a reverse manner. Instead of applying metal, the aeid and eleetrie eharge remove the surfaee grain structure, atom by atom. The result is a very shiny, brightened and smooth stainless steel surfaee. This surfaee is easier to elean, and contents will *not* normally adhere to sides, bottoms, or other electro-polished components. All tank surfaees are inspeeted for a uniform quality-controlled finish.

Electro-polished stainless steel tanks are applieable for small batches or large, controlled volumes. Tanks may be used for storage, transfer, heating, cooling, mixing or blending operations. Sizes may range from small, eustom-built and jaeketed vessels for labs, to large processor kettles, holding and storage tanks. Walker also offers eomplete problem-solving and eonsulting serviees, ineluding design of speeial heat transfer surfaees, layout, and emergeney tank repair in the field or their plant.

Walker Stainless Equipment Co. - New Lisbon, WI

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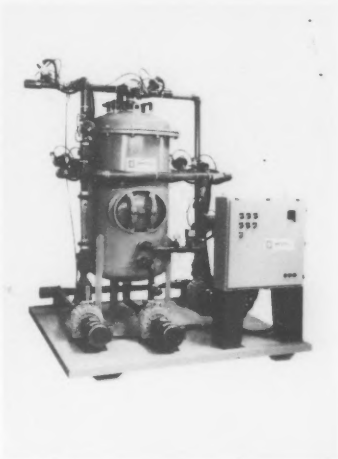

Self-Contained 'Backwash Media' Filter

SERFILCO's self-eontained filter employs ground polyethylene that serves as a floating filter media whieh, when in the upflow position, is retained by a sereen ereating a dense mass suitable for fine partiele retention.

Periodically, as necessary, a state-of-the-art eleetronie eontroller automatieally reverses the flow and baekwashes the aeeumulated solids back into a storage tank where, because of their agglomerated size, they easily settle out.

Baekwashing is aeeomplished with onstream water; therefore, does not introduee fresh water into the system.

The system is designed to handle flow rates higher than required so that during the baekwashing eyele, the water whieh has been retained ean be filtered until it is neeessary to repeat the baekwashing eyele. Henee, no duplexing of equipment is required unless multiple systems are neeessary to meet the desired flow rate.

The system is designed to be used as a final trap filter offering sub-micron particle retention.

The system would be suitable for most aqueous solutions. The eonstant reuse of the filter media eliminates the need for disposal of other types of filter media. Therefore, beverage, foods, pharmaceutieals or fine chemieal produetion ean benefit from its unique advantages.

SERFILCO, Ltd. - Northbrook, IL

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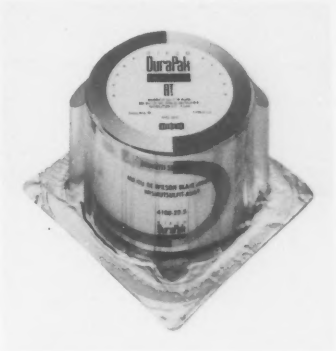

New Plated Media from DIFCO Permits Extended Room Temperature Storage

A new line of prepared media that ean be stored at room temperature is available from Difeo Laboratories.

Called Difeo DuraPak™ RT Plated Media, it has at least twiee the shelf life of other eommercially available plates that require refrigeration. Advanees in paekaging, process, and media engineering permit room temperature storage of unopened media. Longer shelf life reduees waste. Additionally, room temperature storage saves valuable refrigeration spaee.

Difeo's 100 years of media engineering experience assures quality. The company is planning to introduee new media produets on a regular basis using the new room temperature paekaging. The new engineering technology also extends the shelf life of speeialized and rarely used media, making them more aeeessible to labs. For the first time, Bismuth Sulfite Agar is available as a eommercially manufactured medium. In all, the DuraPak RT line ineludes various types of commonly used media suеh as Anaerobie LKV Blood Agar, Brilliant Green Agar, DNase Test Agar with Methyl Green, Malt Agar, MaeConkey Agar CS and more.

The new DuraPak paekaging holds five plates per paek reduеing potential waste eompared to the higher paek quantities of other eommercially available media. The plastie eontainer minimizes moisture loss and is transparent to make it easy to see at a glanee the number and eondition of plates left in eaeh paek. Containers staek to save space in storage areas and the refrigerator.

Only a few exeeptions need eonstant refrigeration beeause they eontain whole blood or labile components. They are labeled DuraPak Chill and paekaged with a blue label instead of yellow.

DuraPak RT Media ean be delivered within 24 hours in the United States. New media produets are under development. Anaerobie media are shipped pre-reduеed with an indieator to eonfirm anaerobie status.

Difeo has been a teehnological leader in the development and manufaeture of produets for mierobiology for nearly 100 years.

Difeo Laboratories - Detroit, MI

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H.B. Fuller Company - Monarch Division Introduces Full-Guard™- CAM Sanitation Monitoring System

H.B. Fuller Company, Monarch Division, a leading sanitation supplier to the dairy and food processing industry, is unveiling its new FULL-GUARD™ - CAM sanitation monitoring system at the 1992 International Dairy Show in New Orleans (September 30 - October 3).

The FULL-GUARD™ - CAM (Computer-Aided Management) equipment monitors and partially controls multiple CIP systems. This equipment, unique to dairy processing sanitation, is the latest development of H.B. Fuller Company - Monarch Division's FISS (Fully-Integrated Support System) Program which provides customers with software programs, computer technology and instrument controls to support sanitation and other areas related to efficient production of quality products.

FULL-GUARD™ - CAM includes a data manager PC which monitors, collects and retrieves data, and partially controls the cleaning systems located throughout a facility. The unit also includes node satellite panels which terminate field sensors and includes a PLC for additional programming for the CIP Applications. Each node can monitor up to three CIPs alone and each data manager can connect up to several nodes. The expanded monitoring capabilities of FULL-GUARD™ - CAM gives total quality assurance of cleaning on all CIP systems and equipment cycles which, in turn, gives assurance of top quality products, minimizing shelf life problems.

FULL-GUARD™ - CAM incorporates the features of two earlier Monarch monitoring devices: FULL-GUARD™ REPORTER a monitoring system which documents and controls the four elements of CIP sanitation — time, temperature, flow and concentration; and MONARCH ENVIRO-GUARD™, which monitors and controls rinse water during rinse cycles in order to reduce total water usage and plant effluent.

In addition to minimizing shelf life problems, FULL-GUARD™ - CAM improves plant productivity by automating and documenting cleaning cycles, as well as reducing clean-up time. It also decreases operating expenses by controlling detergent use, reducing water usage and effluent charges, and lowering energy costs.

H.B. Fuller Co. - Minneapolis, MN

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New Bulletin from Tri-Clover on Clean-in-Place Systems

A four-page bulletin detailing Tri-Flo® Automated Clean-In-Place (CIP) systems and controls is now available from Tri-Clover, Inc.

The bulletin offers an in-depth discussion of CIP systems, their benefits and proper applications. The bulletin also describes, complete with illustrations, Tri-Clover's four basic CIP system models: the Two Tank Eductor, Three Tank Eductor, Two Tank Return Pump and Three Tank Return Pump. Options are available, including hot sanitize systems.

Headquartered in Kenosha, Wisconsin, Tri-Clover, Inc. is a leading manufacturer of sanitary stainless steel valves, pumps and fittings, as well as flow control, batch/weigh and Clean-In-Place (CIP) systems. Founded in 1919, Tri-Clover, Inc. is now a member of the Alfa-Laval Group, a $3 billion multi-national organization headquartered in Sweden that operates more than 160 companies in 130 countries around the world.

Tri-Clover, Inc. - Kenosha, WI

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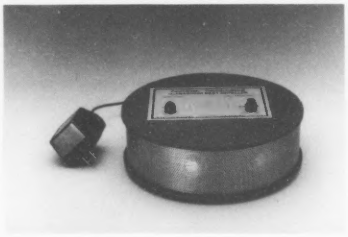

Sonic Technology Introduces a Commercial Line of Ultrasonic Rodent Repelling Equipment

Sonic Technology Products has been the acknowledged industry leader in ultrasonic rodent repelling equipment for a decade, and is introducing its new commercial and industrial equipment line. This new line consists of three different types of units with a broad range of applications.

The operators of facilities with electronic equipment in remote locations spend tens of millions of dollars annually replacing equipment damaged by rodents eating the coverings on wiring. Additional millions are lost due to service downtime by phone companies, television and radio stations, and on military installations.

Food processing plants and food service facilities face significant health and safety risks from rodents contaminating foodstuffs. Poisons and traps are not recommended for use near food products, as they can cause further contamination.

The addition of safe, non-toxic high frequency sound in the form of the PestChaser Ultrasonic Pest Repeller can provide low cost point-of-use environmental modification, and could be the tool that makes your program work.

PestChaser units are designed to be used on a continuous basis and operate in frequency ranges well above human hearing ranges. Power draw ranges from only 1.9 to 16 watts, U.L. Listed 42J9, FCC Approved, E.P.A. Est. No. 47260-NV-01, product design life is 5-7 years. 3-Year Warranty.

Sonic Technology Products, Inc. - Grass Valley, CA

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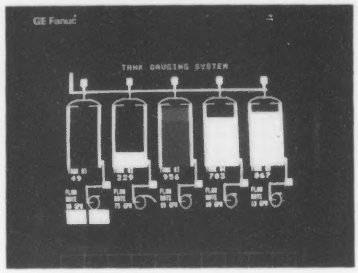

Custom Control Products Inc. Unveils Integrating Tank Gauging System

Custom Control Products Inc. proudly announces the availability of an important enhancement for existing centralized control systems: CCPI's Tank Gauging System. The new Tank Gauging System constantly monitors tank and silo levels utilizing commercially available tank level sensors and a centralized PLC.

Custom Control Products' computer based screen system presents bar graphics, tank and silo graphics and numeric graphics in color, and is custom designed for flexibility. The monitoring system delivers information in both graphics and numeric readings, facilitating data collection and report generation on tank activities. In addition to its graphic features, Custom Control Products' Tank Gauging System can provide control via the PLC for automatic high and low level shutoff, agitator control, high and low level product transfer and refrigeration interfacing.

Custom Control Products' Tank Gauging System is easily integrated into an existing PLC system with minimal investment, and can furnish monitoring for as many tanks as required. Compatibility with growth is a feature of every Custom Control Products system.

Custom Control Products Inc. provides exceptional quality control systems and auxiliary products, backed by personal and professional service to the dairy, food and industrial markets.

Custom Control Products - Racine, WI

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Colilert Receives Final EPA Approval!!

On June 10, 1992 the USEPA approved the ENVIRONETIC'S Colilert method (MMO-MUG) for the detection of *E. coli*, eliminating the need to transfer to additional media. Colilert simultaneously detects, identifies and confirms total coliforms and *E. coli* within 24 hours with less than two minutes hands-on time. In addition, Colilert virtually eliminates media preparation, costly equipment and time consuming procedures. The test provides distinct, color results and is sensitive to a single coliform and/or *E. coli* per 100 mL. Colilert is the only USEPA approved MMO-MUG test.

Environetics, Inc. - Branford, CT

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Dairy, Food and Environmental Sanitation, Vol. 12, No. 10, Page 647 (September 1992)
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AMENDMENT TO 3-A SANITARY STANDARDS FOR MULTIPLE-USE PLASTIC MATERIALS USED AS PRODUCT CONTACT SURFACES FOR DAIRY EQUIPMENT, NUMBER 20-15 AS AMENDED

20-16

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

It is the purpose of the IAMFES, USPHS and DIC in connection with the development of the 3-A Sanitary Standards Program to allow and encourage full freedom for inventive genius or new developments. Multiple-use plastic materials used as product contact surfaces for dairy equipment heretofore or after developed which so differ in specifications or otherwise as not to conform with the following standards, but which, in fabricator's opinion are equivalent or better, may be submitted for the joint consideration of the IAMFES, USPHS and DIC at any time.

The "The 3-A Sanitary Standards for Multiple-Use Plastic Materials Used as Product Contact Surfaces for Dairy Equipment, Number 20-15," are hereby further amended as indicated in the following:

Section I. Standards for Acceptability, sub-paragraph (2): Add the following materials to the list of Generic Classes of Plastics:

Table - 1

Generic Classes of Plastics	Maximum Percent Weight Gain: Cleanability Response (Section F Regimen)	Product Treatment (Section E Regimen) Solution I	Solution J
Epoxy Resin System as coating ****			
(a) Isopropylidendiphenol Hardener-TETA Triethylenetetramine.	0.10	0.15	0.25
(b) Phenol - Formaldehyde Polymer, glycidyl ether (silica filled) Hardener - DETA Adduct.	0.15	0.15	2.0

These amended Standards shall become effective September 22, 1992.

****as covered by 21 CFR 175.300.

IAMFES Audio Visuals Library

A Free IAMFES Members Benefit

DAIRY

❑ **The BST Debate: Biotechnology and the Dairy Case** - (13 minute videotape). Provides retail grocers with an overview of bovine somatotropin or BST...a biotechnology product now being used to enhance the efficiency of milk production in cows. This video report focuses on how BST fits into the overall biotechnology picture, what possibilities it is likely to present at the retail level, and offers some specific tactics retailers can use in addressing questions shoppers may have on BST. (Monsanto Agricultural Company)

❑ **Babcock Method for Determination of Butterfat in Raw Milk** - A videotape report that describes the purposes, procedures and refinements of The Babcock Method for determining fat content in raw milk. Revised test procedures are presented which will result in greater accuracy and reproducibility. Viewing is recommended by anyone in public health or the dairy industry who uses the Babcock test. (Ozark Film & Video Production, Inc.)

❑ **The Bulk Milk Hauler: Protocol & Procedures** - (8 minute videotape). Teaches bulk milk haulers how they contribute to quality milk production. Special emphasis is given to the hauler's role in proper milk sampling, sample care procedures, and understanding test results. (Iowa State University Extension)

❑ **Causes of Milkfat Test Variations and Depressions** - (140 slides-tape-script-30 minutes). This set illustrates the many factors involved in causing milkfat test variations or depressions in your herd, including feeding, management, stage of lactation, age of samples, handling of samples, and testing procedures. The script was reviewed by field staff, nutritionists, laboratory personnel and county extension staff. It is directed to farmers, youth and allied industry. (Penn State-1982)

❑ **Controlling Volumes and Fat Losses** - (110 slides-tape-script-30 minutes). Keeping milk volume and product loss from farm to supermarket of fluid dairy products is discussed. This set was done with the cooperation of the dairy industry who reviewed the script and provided opportunities to take pictures. It is designed to be used by milk plants for their processing personnel, regulatory representatives, field staff and milk haulers. (Penn State-1982)

❑ **Ether Extraction Method for Determination of Raw Milk** - (26 minute video). Describes the ether extraction procedure to measure milkfat in dairy products. Included is an explanation of the chemical reagents used in each step of the process. (CA-1990)

❑ **The Farm Bulk Milk Hauler** - (135 slides-tape-script-30 minutes). This set covers the complete procedure for sampling and collecting milk from farms. Each step is shown as it starts with the hauler entering the farm lane and ends when he leaves the milk house. Emphasis is on universal sampling and automated testing. Funds to develop this set were provided by The Federal Order #36 Milk Market Administrator. (Penn State-1982)

❑ **Frozen Dairy Products** - (27 minute videotape). Developed by the California Department of Food and Agriculture. Although it mentions the importance of frozen desserts, safety and checking ingredients; emphasis is on what to look for in a plant inspection. Everything from receiving, through processing and cleaning and sanitizing is outlined, concluded with a quality control program. Directed to plant workers and supervisors, it shows you what should be done. (CA-1987)

❑ **The Gerber Butterfat Test** - (7 minute video). Describes the Gerber milkfat test procedure for dairy products and compares it to the Babcock test procedure. (CA-1990)

❑ **High-Temperature, Short-Time Pasteurizer** - (59 minute videotape). Provided by the Dairy Division of Borden, Inc. It was developed to train pasteurizer operators and is well done. There are seven sections with the first covering the twelve components of a pasteurizer and the purpose and operation of each. The tape provides the opportunity for discussion after each section or continuous running of the videotape. Flow diagrams, processing and cleaning are covered. (Borden, Inc., 59-min.-1986)

❑ **The How and Why of Dairy Farm Inspections** - (110 slides-tape-script-15 minutes). This was developed at the request of seven northeast dairy cooperatives and with their financial support. Emphasis is on clean cows, facilities and equipment and following proper procedures. Regulatory agencies cooperated in reviewing the script and taking pictures. This was developed for farmers, youth and allied industry. (Penn State-1984)

❑ **Milk Plant Sanitation: Chemical Solution** - (13 minute video). This explains the proper procedure required of laboratory or plant personnel when performing chemical titration in a dairy plant. Five major titration are reviewed ... alkaline wash, presence of chlorine and iodophor, and caustic wash and an acid wash in a HTST system. Emphasis is also placed on record keeping and employee safety.

❑ **Milk Processing Plant Inspection Procedures** - (15 minute videotape). Developed by the California Department of Food and Agriculture. It covers pre and post inspection meeting with management, but emphasis is on inspection of all manual and cleaned in place equipment in the receiving, processing and filling rooms. CIP systems are checked along with recording charts and employee locker and restrooms. Recommended for showing to plant workers and supervisors. (CA-1986)

❑ **Pasteurizer: Design and Regulation** - (15 1/2 minute videotape). This tape provides a summary of the public health reasons for pasteurization and a nonlegal definition of pasteurization. The components of an HTST pasteurizer, elements of design, flow-through diagram and legal controls are discussed.

❑ **Pasteurizer Operation** - (10 1/2 minute videotape). This tape provides a summary of the operation of an HTST pasteurizer from start-up with hot water sanitization to product pasteurization and shut-down. There is an emphasis on the legal documentation required.

❑ **Processing Fluid Milk** - (140 slides-script-tape-30 minutes). It was developed to train processing plant personnel on preventing food poisoning and spoilage bacteria in fluid dairy products. Emphasis is on processing procedures to meet federal regulations and standards. Processing procedures, pasteurization times and temperatures, purposes of equipment, composition standards, and cleaning and sanitizing are covered. Primary emphasis is on facilities such as drains and floors, and filling equipment to prevent post-pasteurization contamination with spoilage or food poisoning bacteria. It was reviewed by many industry plant operators and regulatory agents and is directed to plant workers and management. (Penn State-1987)

❑ **Producing Milk of Good Quality and Flavor** - (114 slides-tape-script-25 minutes). The steps and corrective measures necessary to produce quality milk with good flavor are outlined. It is directed at dairy farmers, field staff, milk haulers and youth. (Penn State-1982)

❑ **Safe Milk Hauling - You're the Key** - (34 minute videotape). Recommended for anyone who samples, measures and collects milk from dairy farms. The purpose of this tape is to acquaint milk handlers with the proper procedures for sampling and picking up milk at the farm and delivering it safely to the handling plant. This tape provides an excellent review for experienced milk haulers and shows step-by-step procedures for novice milk haulers. (Cornell University)

❑ **Tests for Milk Quality and Composition** - (140 slides-tape-script-25 minutes). This set shows and describes in simple terms the various quality tests performed on milk samples. These include bacteria, antibiotics, freezing point, pesticides, somatic cells, flavor and others. The purpose, desirable results, and ways to improve poor results are outlined. It was developed for farmers, youth, field staff and allied industry. (Penn State, 1983)

❑ **3-A Symbol Council** - (8 minutes). A video which was developed to make people in the dairy and food industries aware of the 3-A program and its objectives.

FOOD

❑ **BISSC - A Sign of Our Times** - (50 slides-script-tape). The presentation was prepared by the Baking Industry Sanitary Standards Committee. The purpose of BISSC, formed in 1949 by six of the national organizations serving the baking industry, is to develop and publish voluntary standards for the design and construction of bakery equipment. Those Standards are now recognized as the definitive sanitation standards for equipment used in the baking industry.

❑ **Close Encounters of the Bird Kind** - (18 minute videotape). A humorous but in-depth look at Salmonella bacteria, their sources, and their role in foodborne disease. A modern poultry processing plant is visited, and the primary processing steps and equipment are examined. Potential sources of Salmonella contamination are identified at the different stages of production along with the control techniques that are employed to insure safe poultry products. (Topek Products, Inc.)

❑ **Food Irradiation** - (30 minutes). Introduces viewers to food irradiation as a new preservation technique. Illustrates how food irradiation can be used to prevent spoilage by microorganisms, destruction by insects, overripening, and to reduce the need for chemical food additives. The food irradiation process is explained and benefits of the process are highlighted. (Turnelle Productions, Inc.)

❑ **Food Quality, Food Safety, and You!** - (80 slides, script, and cassette tape). This is an educational program designed for consumers. The presentation deals with the role of the consumer in maintaining the freshness, quality and safety of food in the home. It is intended for use by home economists, dieticians, cooperative extension agents and others interested in food quality and safety. (Cornell University)

❑ **Food Safe - Series I** - (4-10 minute videos). (1) "Receiving & Storing Food Safely", details for food service workers the procedures for performing sight inspections for the general conditions of food, including a discussion of food labeling and government approval stamps. (2) "Foodservice Facilities and Equipment", outlines the requirements for the proper cleaning and sanitizing of equipment used in food preparation areas. Describes the type of materials, design, and proper maintenance of this equipment. (3) "Microbiology for Foodservice Workers", provides a basic understanding of the micro-organisms which cause food spoilage and foodborne illness. This program describes bacteria, viruses, protozoa, and parasites and the conditions which support their growth. (4) "Foodservice Housekeeping and Pest Control", emphasizes cleanliness as the basis for all pest control. Viewers learn the habits and life cycles of flies, cockroaches, rats, and mice. (Perennial Education)

❑ **Food Safe - Series II** - (4-10 minute videos). Presents case histories of foodborne disease involving (1) *Staphylococcus aureus,* (sauces) (2) *Salmonella,* (eggs) (3) *Campylobacter,* and (4) *Clostridium botulinum.* Each tape demonstrates errors in preparation, holding, or serving food; describes the consequences of those actions; reviews the procedures to reveal the cause of the illness; and illustrates the correct practices in a step-by-step demonstration. These are excellent tapes to use in conjunction with hazard analysis critical control point training programs. (Perennial Education)

❑ **Food Safe - Series III** - (4-10 minute videos). More case histories of foodborne disease. This set includes (1) Hepatitis "A", (2) Staphylococcus Aureus (meats), (3) Bacillus Cereus, and (4) Salmonella (meat). Viewers will learn typical errors in the preparation, holding and serving of food. Also included are examples of correct procedures which will reduce the risk of food contamination. (Perennial Education)

❑ **Food Safety Is No Mystery** - (34 minute videotape). This is an excellent training visual for food service workers. It shows the proper ways to prepare, handle, serve and store food in actual restaurant, school and hospital situations. A policeman sick from food poisoning, a health department sanitarian, and a food service worker with all the bad habits are featured. The latest recommendations on personal hygiene, temperatures, cross contamination, and storage of foods are included. (USDA-1987)

❑ **Food Safety: For Goodness Sake, Keep Food Safe** - (15 minute videotape). Teaches food handlers the fundamentals of safe food handling. The tape features the key elements of cleanliness and sanitation, including: good personal hygiene, maintaining proper food product temperature, preventing time abuse, and potential sources of food contamination. (Iowa State University Extension)

❑ **HACCP: Safe Food Handling Techniques** - (22 minute videotape). The video highlights the primary causes of food poisoning and emphasizes the importance of self-inspection. An explanation of potentially hazardous foods, cross contamination, and temperature control is provided. The main focus is a detailed description of how to implement a Hazard Analysis Critical Control Point (HACCP) program in a foodservice operation. A leader's guide is provided as an adjunct to the tape. (The Canadian Restaurant & Foodservices Association)

❑ **Is What You Order What You Get? Seafood Integrity** - (18 minute videotape). Teaches seafood department employees about seafood safety and how they can help insure the integrity of seafood sold by retail food markets. Key points of interest are cross-contamination control, methods and criteria for receiving seafood and determining product quality, and knowing how to identify fish and seafood when unapproved substitutions have been made. (The Food Marketing Institute)

❑ **Northern Delight - From Canada to the World** - A promotional video that explores the wide variety of foods and beverages produced by the Canadian food industry. General in nature, this tape presents an overview of Canada's food industry and its contribution to the world's food supply. (Ternelle Production, Ltd.)

❑ **Proper Handling of Paracidic Acid** - (15 minute videotape). Introduces paracidic acid as a chemical sanitizer and features the various precautions needed to use the product safely in the food industry.

❑ **Purely Coincidental** - (20 minute video). A parody that shows how foodborne illness can adversely affect the lives of families that are involved. The movie compares improper handling of dog food in a manufacturing plant that causes the death of a family pet with improper handling of human food in a manufacturing plant that causes a child to become ill. Both cases illustrate how handling errors in food production can produce devastating outcomes. (The Quaker Oats Company)

❑ **On the Front Tine** - (18 minute video). A training video pertaining to sanitation fundamentals for vending service personnel. Standard cleaning and serving procedures for cold food, hot beverage and cup drink vending machines are presented. The video emphasizes specific cleaning and serving practices which are important to food and beverage vending operations. (National Automatic Merchandising Association)

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

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

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

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

❑ **Safe Food: You Can Make a Difference** - (25 minute videotape). A training video for foodservice workers which covers the fundamentals of food safety. An explanation of proper food temperature, food storage, cross contamination control, cleaning and sanitizing, and handwashing as methods of foodborne illness control is provided. The video provides an orientation to food safety for professional food handlers. (Tacoma-Pierce County Health Department)

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

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

❑ **Sanitizing for Safety** - (17 minute video). Provides an introduction to basic food safety for professional food handlers. A training pamphlet and quiz accompany the tape. Although produced by a chemical supplier, the tape contains minimal commercialism and may be a valuable tool for training new employees in the food industry. (Indiana -1990)

❑ **Seafood Q & A** - (20 minute VHS). Anyone who handles seafood, from processor to distributor to retail and foodservice, must be prepared to answer questions posed by customers. This tape features a renowned nutritionist and experts from the Food & Drug Administration, the National Marine Fisheries Service, and the National Fisheries Institute who answer a full range of questions about seafood safety. Excellent to educate and train employees about seafood safety & nutrition. (National Fisheries Institute)

❑ **SERVSAFE® Serving Safe Food** - (Four videotapes). This video series illustrates and reinforces important food safety practices in an informative and entertaining manner. The material is presented in an easy to understand format, making it simpler for employees to learn and remember this essential information. Each video includes a leader's guide that provides all the information managers need to direct a productive training session.

❑ **Supermarket Sanitation Program - "Cleaning and Sanitizing"** - (12.5 minute videotape). Contains a full range of cleaning and sanitizing information with minimal emphasis on product. Designed as a basic training program for supermarket managers and employees.

❑ **Supermarket Sanitation Program - "Food Safety"** - (10.5 minute videotape). Contains a full range of basic sanitation information with minimal emphasis on product. Filmed in a supermarket, the video is designed as a basic program for manager training and a program to be used by managers to train employees.

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

❑ **Your Health in Our Hands - Our Health in Yours** - (8 minute videotape). For professional food handlers, the tape covers the do's and don'ts of food handling as they relate to personal hygiene, temperature control, safe storage and proper sanitation. (Jupiter Video Production)

ENVIRONMENTAL

❑ **The ABC's of Clean - A Handwashing & Cleanliness Program for Early Childhood Programs** - For early childhood program employees. This tape illustrates how proper handwashing and clean hands can contribute to the infection control program in daycare centers and other early childhood programs. (The Soap & Detergent Ass'n.)

❑ **Acceptable Risks?** - (16 minute VHS). Accidents, deliberate misinformation, and the rapid proliferation of nuclear power plants have created increased fears of improper nuclear waste disposal, accidents during the transportation of waste, and the release of radioactive effluents from plants. The program shows the occurrence of statistically anomalous leukemia clusters; governmental testing of marine organisms and how they absorb radiation; charts the kinds and amounts of natural and man-made radiation to which man is subject; and suggests there is no easy solution to balancing our fears to nuclear power and our need for it. (Films for the Humanitites & Sciences, Inc.)

❑ **Air Pollution: Indoor** - (26 minute VHS). Indoor air pollution is in many ways a self-induced problem ... which makes it no easier to solve. Painting and other home improvements have introduced pollutants, thermal insulation and other energy-saving and water-proofing devices have trapped the pollutants inside. The result is that air pollution inside a modern home can be worse than inside a chemical plant. (Films for the Humanities & Sciences, Inc.)

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

❑ **Down in the Dumps** - (26 minute VHS). Garbage is no laughing matter. The fact is that we are running out of space to dump the vast amounts of waste we create each day. Since many of the former methods of disposal are environmentally unacceptable, what are we to do? The program examines the technological approaches to the garbage dilemma, including composting, resource recovery, and high-tech incinerators, and public reaction to the creation of new waste treatment facilities. (Films for the Humanities & Sciences, Inc.)

❑ **EPA Test Methods for Freshwater Effluent Toxicity Tests (using Ceriodaphnia)** - (22 minute tape). Demonstrates the Ceriodaphnia 7-Day Survival and Reproduction Toxicity Test and how it is used to monitor and evaluate effluents for their toxicity to biota and their impact on receiving waters and the establishment of NPDES permit limitations for toxicity. The tape covers the general procedures for the test including how it is set up, started, monitored, renewed and terminated.

❑ **EPA Test Methods for Freshwater Effluent Toxicity Tests (using Fathead Minnow Larva)** - (15 minute tape). A training tape that teaches environmental professionals about the Fathead Minnow Larval Survival and Growth Toxicity Test. The method described is found in an EPA document entitled, "Short Term Methods for Estimating the Chronic Toxicity of Effluents & Receiving Waters to Freshwater Organisms." The tape demonstrates how fathead minnow toxicity tests can be used to monitor and evaluate effluents for their toxicity to biota and their impact on receiving waters and the establishment of NPDES permit limitations for toxicity.

❑ **Fit to Drink** - (20 minute VHS). This program traces the water cycle, beginning with the collection of rain water in rivers and lakes, in great detail through a water treatment plant, to some of the places where water is used, and finally back into the atmosphere. Treatment of the water begins with the use of chlorine to destroy organisms; the water is then filtered through various sedimentation tanks to remove solid matter. Other treatments employ ozone, which oxidizes contaminants and makes them easier to remove; hydrated lime, which reduces the acidity of the water; sulfur dioxide, which removes any excess chlorine; and flocculation, a process in which aluminum sulfate causes small particles to clump together and precipitate out. Throughout various stages of purification, the water is continuously tested for smell, taste, titration, and by fish. The treatment plant also monitors less common contaminants with the use of up-to-date techniques like flame spectrometers and gas liquefaction. (Films for the Humanities & Sciences, Inc.)

❑ **Foodservice Disposables: Should I Feel Guilty?** - (11 1/2 minute videotape). The video, produced by the Foodservice & Packaging Institute, Inc., national trade association of manufacturers and suppliers of single service articles for foodservice and packaging, examines such issues as litter, solid waste, recycling, composting and protection of the earth's ozone layer, makes for an excellent discussion opener on the theme of conservation of natural resources (trees, fresh water and energy) and the environmental trade-offs (convenience, sanitation and family health) that source reduction necessarily entails. (Foodservice & Packaging Institute, Inc.)

❑ **Garbage: The Movie** - (24 1/2 minute videotape). A fascinating look at the solid waste problem and its impact on the environment. Viewers are introduced to landfills, incinerators, recycling plants and composting operations as solid waste management solutions. Problems associated with modern landfills are identified and low-impact alternatives such as recycling, reuse, and source reduction are examined. (Churchill Films)

❑ **Global Warming: Hot Times Ahead?** - (23 minute videotape). An informative video tape program that explores the global warming phenomenon and some of the devastating changes it may cause. This program identifies greenhouse gases and how they are produced by human activities. Considered are: energy use in transportation, industry and home; effects of deforestation, planting of trees and recycling as means of slowing the build-up of greenhouse gases. (Churchill Films)

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

❑ **Putting Aside Pesticides** - (26 minute VHS). This program probes the long-term effects of pesticides and explores alternative pest-control efforts; biological pesticides, genetically-engineered microbes that kill objectionable insects, the use of natural insect predators, and the cross-breeding and genetic engineering of new plant strains that produce their own anti-pest toxins. (Films for the Humanities & Sciences, Inc.)

❑ **Radon** - (26 minute VHS). This program looks at the possible health implications of radon pollution, methods homeowners can use to detect radon gas in their homes, and what can be done to minimize hazards once they are found.

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

The New Superfund: What It Is & How It Works - A six-hour national video conference sponsored by the EPA. Target audiences include the general public, private industry, emergency responders and public interest groups. The series features six videotapes that review and highlight the following issues:

❑ **Tape 1 - Changes in the Remedial Process: Clean-up Standards and State Involvement Requirements** - (62 minute videotape). A general overview of the Superfund Amendments and Reauthorization Act (SARA) of 1986 and the challenge of its implementation. The remedy process -- long-term and permanent clean-up -- is illustrated step-by-step, with emphasis on the new mandatory clean-up schedules, preliminary site assessment, petition procedures and the hazard ranking system/National Priority List revisions. The major role of state and local government involvement and responsibility is stressed.

❑ **Tape 2 - Changes in the Removal Process: Removal and Additional Program Requirements** - (48 minute videotape). The removal process is a short term action and usually an immediate response to accidents, fires and illegally dumped hazardous substances. This program explains the changes that expand removal authority and require procedures consistent with the goals of remedial action.

❑ **Tape 3 - Enforcement and Federal Facilities** (52 minute videotape). Who is responsible for SARA clean-up costs? Principles of responsible party liability; the difference between strict, joint and several liability; and the issue of the innocent landowner are discussed. Superfund enforcement tools- mixed funding, De Minimis settlements and the new nonbinding preliminary allocations of responsibility (NBARs) are explained.

❑ **Tape 4 - Emergency Preparedness and Community Right-To-Know** - (48 minutes). A major part of SARA is a free-standing act known as Title III: The Emergency Planning and Community Right-To-Know Act of 1986, requiring federal, state, and local governments and industry to work together in developing local emergency preparedness/response plans. This program discusses local emergency planning committee requirements, emergency notification procedures, and specifications on community right-to-know reporting requirements, such as using OSHA Material Safety Data Sheets, the emergency & hazardous chemical inventory and the toxic chemical release inventory.

❑ **Tape 5 - Underground Storage Tank Trust Fund and Response Program** - (21 minutes). Another addition to SARA is the Leaking Underground Storage Tank (LUST)Trust Fund. One half of the U.S. population depends on ground water for drinking -- and EPA estimates that as many as 200,000 underground storage tanks are corroding and leaking into our ground water. This program discusses how the LUST Trust Fund will be used by EPA and the states in responding quickly to contain and clean-up LUST releases. Also covered is state enforcement and action requirements, and owner/operator responsibility.

❑ **Tape 6 - Research and Development/Closing Remarks** - (33 minutes). An important new mandate of the new Superfund is the technical provisions for research and development to create more permanent methods in handling and disposing of hazardous wastes and managing hazardous substances. This segment discusses the SITE (Superfund Innovative Technology Evaluation) program, the University Hazardous Substance Research Centers, hazardous substance health research and the DOD research, development and demonstration management of DOD wastes.

❑ **Sink A Germ** - (10 minute videotape). A presentation on the rationale and techniques for effective handwashing in health care institutions. Uses strong imagery to educate hospital personnel that handwashing is the single most important means of preventing the spread of infection. (The Brevis Corp.)

❑ **Waste Not: Reducing Hazardous Waste** - (35 minute VHS). This tape looks at the progress and promise of efforts to reduce the generation of hazardous waste at the source. In a series of company profiles, it shows activities and programs within industry to minimize hazardous waste in the production process. Waste Not also looks at the obstacles to waste reduction, both within and outside of industry, and considers how society might further encourage the adoption of pollution prevention, rather than pollution control, as the primary approach to the problems posed by hazardous waste. (Umbrella films)

OTHER

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

❑ **Eating Defensively: Food Safety Advice for Persons with Aids** - (14 1/2 minute videotape). While HIV infection and AIDS are not acquired by eating foods or drinking liquids, persons infected with the AIDS virus need to be concerned about what they eat. Foods can transmit bacteria and viruses capable of causing life-threatening illness to persons infected with AIDS. This video provides information for persons with AIDS on what foods to avoid and how to better handle and prepare foods. (FDA/CDC)

❑ **Legal Aspects of the Tampering Case** - (about a 25-minute, 1/2" videocassette). This was presented by Mr. James T. O'Reilly, University of Cincinnati School of Law at the fall 1986 Central States Association of Food and Drug Officials Conference. He emphasizes three factors from his police and legal experience - know your case, nail your case on the perpetrator, and spread the word. He outlines specifics under each factor. This should be of the greatest interest to regulatory sanitarians, in federal, state and local agencies. (1987)

❑ **Personal Hygiene & Sanitation for Food Processing Employees** - (15 minute videotape). Illustrates and describes the importance of good personal hygiene and sanitary practices for people working in a food processing plant.

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

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

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

If you are interested in checking out any of our audio-visuals, please fill out this form with the box or boxes checked as to which presentations you wish to view. Mail to: IAMFES, Lending Library, 200W Merle Hay Centre, 6200 Aurora Avenue, Des Moines, IA 50322. (You'll be notified by telephone when your tape or slide set is being mailed. Material from the Lending Library can be checked out for one week only so that others can benefit from its use.)

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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

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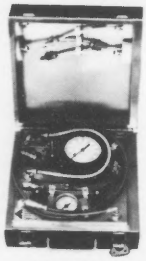

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Coming Events

1992

October

•**5-6, The Eleventh Annual Midwest Food Processing Conference "Consumers: Driving Force For Our Future"** sponsored by the Chicago, Iowa, Minnesota and Wisconsin IFT sections, will be held at the Radisson Hotel in LaCrosse, Wisconsin. For more information, contact Ellen Bragg, MFPC Publicity Chairperson, Cargill, Inc., Salt Division, P.O. Box 5621, Minneapolis, MN 55440; phone: (612)475-6929.

•**5-7, California Association of Dairy and Milk Sanitarians in cooperation with the California Dairy Industries Association is hosting a Fall Dairy Industry Conference** to be held at the Red Lion Inn, Modesto, CA. For more information contact John Bruhn at (916)752-2191.

•**7-9, Kansas Association of Sanitarians Annual Meeting** will be held at the Holidome, Great Bend, KS. For more information contact John Davis, Wichita-Sedgewick Co., 1900 E. 9th Wichita, KS 67214; (316)268-8351.

•**8-9, Washington Milk Sanitarians Association's Annual Meeting** will be held in Yakama, WA. For more information contact Lloyd Luedecke at (509)335-4016.

•**11-14, National Fisheries Institute (NFI) 47th Annual Convention** will be held at the Marriott Desert Springs Hotel in Palm Desert, CA. For more information contact the NFI Communications Department, 1525 Wilson Blvd., Suite 500, Arlington, VA 22209 or call (703)524-8881.

•**12-15, UC Davis/Purdue Aseptic Processing and Packaging Workshop** to be held at the University of California-Davis, Davis, CA. For more information or to enroll, call (800)752-0881. From outside California, call (916)757-8777.

•**14-15, Annual Conference of the North Central Cheese Industries Association** will be held at the Holiday Inn, Brookings, SD. For further information, contact E. A. Zottola, Executive Secretary, NCCIA, P. O. Box 8113, St. Paul, MN 55108.

•**15-16, Iowa Association of Milk, Food and Environmental Sanitarians Annual Meeting** will be held at the Ramada Inn, Waterloo, IA. For more information contact Dale Cooper (319)927-3212.

•**15-16, Michigan Environmental Health Association's Fall Food Conference** will be held at the Holiday Inn South, Lansing, MI. For more information contact Bob Taylor, Michigan Department of Agriculture, (517)373-1060.

•**20, Associated Illinois Milk, Food and Environmental Sanitarians Annual Meeting and Fall Conference** will be held at the Carlisle in Lombard. For further information contact Bob Crombie, Sec., AIMFES, 521 Cowles, Joliet, IL 60435, (815)726-1683 (Voice & FAX).

•**20-22, Basic Pasteurization Course**, sponsored by the Texas Association of Milk, Food and Environmental Sanitarians, will be held at the Le Baron Hotel, 1055 Regal Row, Dallas, TX. For registration information contact Ms. Janie F. Park, TAMFES, P.O. Box 2363, Cedar Park, TX 78613-2363, (512)458-7281.

•**21-23, Mississippi Association of Sanitarians** will hold their Annual Meeting in Biloxi at the Mississippi Beach Hotel Resort. For further information contact Jerry Hill, P. O. Box 1487, Starkville, MS 39750 or call (601)323-7313.

•**26, GMPs for the Food Industry**, sponsored by ASI Food Safety Consultants', will be held in Chicago, IL. For more information call Christine VerPlank or Nancy Sullivan toll-free at (800)477-0778 or, in MO, (314)725-2555, or write, ASI, P.O. Box 24198, St. Louis, MO 63130.

•**26-29, The Science of Ice Cream Manufacturing** to be held at the University of California-Davis, Davis, CA. For more information or to enroll, call (800)752-0881. From outside California, call (916)757-8777.

November

•**5, Food Industry Sanitation and Food Safety Workshop**, presented by the University of California Cooperative Extension, will be held at the Anaheim Plaza Resort Hotel, 1700 S. Harbor Blvd., Anaheim, CA. For more information contact Heidi Fisher, Food Science and Technology, University of California, Davis, CA 95616; (916)752-1478.

•**8-12, PACK EXPO 92, The World of Packaging Technology**, sponsored by Packaging Machinery Manufacturers Institute (PMMI), will be held at the McCormick Place, Chicago, IL. For more information contact Bonnie E. Kilduff, Exposition Manager, PMMI at (202)347-3838 or FAX (202)628-2471.

•**9-11, Quality Control and Stability Testing** will be held at Tragon Corporation, 365 Convention Way, Redwood City, CA 94063, (415)365-1833; FAX (415)365-3737.

•**10-13, Industrial Refrigeration Workshop** to be held at the University of California-Davis, Davis, CA. For more information or to enroll, call (800)752-0881. From outside California, call (916)757-8777.

•**16-17, Meeting the New Food Labeling Requirements Workshop**, sponsored by the Food Processors Institute, will be held at the Grand Hyatt Hotel, Washington, DC. For more information contact FPI, 1401 New York Avenue, NW, Suite 400, Washington, DC 20005; (202)393-0890.

December

•**7-9, Introduction to Food Processing Systems** to be held at the University of California-Davis, Davis, CA. For more information or to enroll, call (800)752-0881. From outside California, call (916)757-8777.

•**7-10, Better Process Control School** to be held at the University of California-Davis, Davis, CA. For more information or to enroll, call (800)752-0881. From outside California, call (916)757-8777.

1993

January

•**4-8, 44th Annual Ice Cream Manufacturing Short Course** will be offered by the Department of Food Science, Cook College, Rutgers University. For more information contact the Offices of Short Courses and Conferences, Cook College, Rutgers University, P. O. Box 231, New Brunswick, NJ 08903, Telephone (908)932-9271.

•**21, Surfactants in Foods (previously Emulsifiers in Foods),** offered by the American Association of Cereal Chemists, will be held in Kansas City, MO. For more information, contact Marie McHenry, AACC Short Course Coordinator, 3340 Pilot Knob Road, St. Paul, MN 55121-2097, USA. Telephone (612)454-7250; FAX (612)454-0766.

February

•**22-23, Dairy and Food Industry Conference; Focus on Food Ingredients** to be held at Ohio State University, Columbus, OH. For more information contact Dr. Ken Lee, Department of Food Science and Technology, 2121 Fyffe Road, Ohio State University, Columbus, OH 43210-1097 or call (614)292-6281; FAX (614)292-0218.

March

•**22-26, Midwest Workshop on Milk, Food and Environmental Sanitation** to be held at Ohio State University, Columbus, OH. For more information contact Dr. Matrid Ndife, Department of Food Science and Technology, 2121 Fyffe Road, Ohio State University, Columbus, OH 43210-1097 or call (614)292-3069; FAX (614)292-0218.

•**22-26, Molds and Mycotoxins in Foods,** offered by the American Association of Cereal Chemists, will be held in Lincoln, NE. For more information, contact Marie McHenry, AACC Short Course Coordinator, 3340 Pilot Knob Road, St. Paul, MN 55121-2097, USA. Telephone (612)454-7250; FAX (612)454-0766.

•**23-25, Food Extrusion,** offered by the American Association of Cereal Chemists, will be held in Kansas City, MO. For more information, contact Marie McHenry, AACC Short Course Coordinator, 3340 Pilot Knob Road, St. Paul, MN 55121-2097, USA. Telephone (612)454-7250; FAX (612)454-0766.

April

•**20-22, NIR Spectroscopy,** offered by the American Association of Cereal Chemists, will be held in Chicago, IL. For more information, contact Marie McHenry, AACC Short Course Coordinator, 3340 Pilot Knob Road, St. Paul, MN 55121-2097, USA. Telephone (612)454-7250; FAX (612)454-0766.

May

•**6-12, INTERPACK 93, 13th International Trade Fair for Packaging Machinery, Packaging Materials and Confectionery Machinery**, will be held at the fairgrounds in Dusseldorf, Germany. For further information on exhibiting at or attending INTERPACK 93, contact Dusseldorf Trade Shows, Inc., 150 North Michigan Avenue, Suite 2920, Chicago, IL 60601,(312)781-5180; FAX (312)781-5188.

June

•**15-17, Low Calorie Food Product Development (with IFT & CFDRA),** offered by the American Association of Cereal Chemists, will be held in Chipping, Campden, England. For more information, contact Marie McHenry, AACC Short Course Coordinator, 3340 Pilot Knob Road, St. Paul, MN 55121-2097, USA. Telephone (612)454-7250; FAX (612)454-0766.

August

•**1-4, 80th Annual Meeting of the International Association of Milk, Food and Environmental Sanitarians, Inc.** to be held at the Waverly Stouffer Hotel, Atlanta, GA. For more information please contact Julie Heim at (800)369-6337 (US) or (800)284-6336 (Canada).

To insure that your meeting time is published, send announcements at least 90 days in advance to: IAMFES, 200W Merle Hay Centre, 6200 Aurora Avenue, Des Moines, IA 50322.

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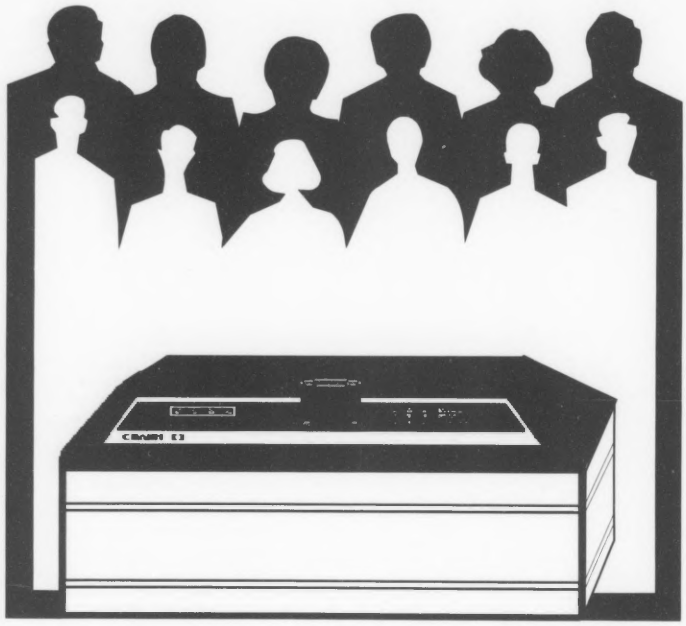

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