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DAIRY, FOOD AND ENVIRONMENTAL

SANITATION

NOVEMBER 1993





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Announcement **Developing Scientist Awards Competitions** (Supported by Sustaining Members)

IAMFES is pleased to announce continued 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 will again offer 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 three 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: \$300 and a certificate of merit; Third 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: First Place: \$500 and an Award Plaque; Second Place: \$300 and a certificate of merit; Third 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*.

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, 1993. 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 or October issues 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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ABOUT THE COVER . . . Photo courtesy of Silliker Laboratories Group, Inc., Homewood, IL. A Silliker lab tech streaks the selective enrichment to the differential plating media to test for Salmonella.

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Thoughts From the President . . .



By
Harold Bengsch
IAMFES President

Health Care Reform and the Sanitarian

Hardly a day goes by that we do not read, hear or see a news article dealing with health care reform. It seems that everyone is clamoring for the health care "system" to be fixed.

To say what we have in the United States today is a health care system, vastly overstates the subject. In fact, it is quite arguably correct to take the position that the current "system" operating in the United States is an "illness care system," not a health care system.

When one examines the World Health Organization's description of primary health care, one finds a much broader definition to the word health than is currently operating in this country's traditional medical model. WHO's definition for primary health care states: "Primary health care is essential health care made universally accessible to individuals and families in the community by means acceptable to them, through their free participation and at a cost that the community and country can afford. It forms an integral part both of the country's health system, of which it is the nucleus, and of the overall social and economic development of the community."

Obviously this definition encompasses a much broader view of health than just that of making someone well, especially as viewed from the last sentence of the definition. To achieve this broader definition of health requires a major public health policy. Unfortunately, the United States does not have that policy and shares that "dubious honor" with less than a handful of industrialized nations.

As we look at the expanded definition of health, I strongly recommend those interested, read "The Belmont Vision for Health Care in America," from the Institute for Alternative Futures. In that document, you see a visioning process that promotes integration of various professional practices that collaborate in the development and practice of the much broader definition of health care. It is very interesting to note the number of times the word environment is used in that document.

This summer, I have been privileged to serve as vice-chairman of the Missouri Health Care Reform, Health Care Design Committee. During our many meetings, it has been interesting to note that when discussing preventive health and primary care services, how often the issues of environmental health and public health sanitation come into play as a matter of policy discussion. A consensus reached by our Committee clearly demonstrated both the necessity and value of a strong environmental health and sanitation presence in the collaborative practice process. This consensus was viewed as necessary to complete the circle of requirements in the preventive and primary practice model.

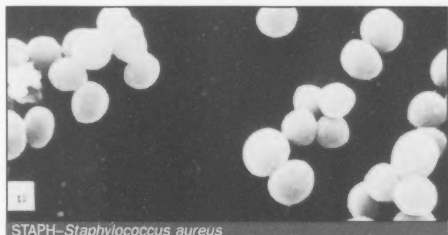
It is of no small significance that President Clinton's health care reform plan outlines certain functions traditional to the profession of the environmental sanitarian.

The "American Health Security Act of 1993," September 7, 1993, under Item 143 states: "Protect Americans against preventable, communicable diseases, exposure to toxic environmental pollutants, harmful products, and poor quality health care." Under Item 144, "Collection and analysis of information on key dimensions to insure timely awareness, decisions and interventions relating to epidemics and emerging patterns of disease . . ." And in Item 145, "Insure adequate training with special emphasis on public health professionals including sanitarians and laboratorians." One can quickly see, our field of professionalism is recognized in this document.

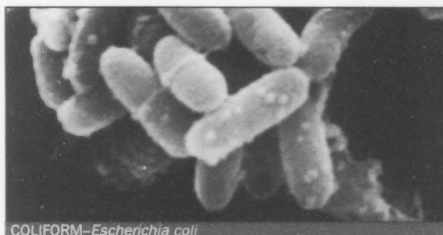
Probably no better illustration for the importance of the preceding paragraph occurred while writing this article. I have just received a call from a local primary care physician who has just diagnosed his patient with giardiasis. This patient has an occupation that could expose him to this organism as well as other potential avenues of exposure. His question to me is, "Do you have a sanitarian who can pick up on this case and help me out?" What better example for collaborative practice in action. Yes, health care reform has plenty of potential for the profession of the sanitarian. The real question is, are we as a profession ready and willing to assume responsibility of the potential which health care reform holds for us?

Until next month.

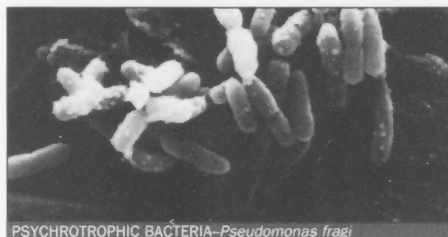
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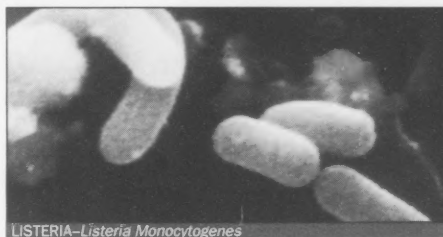
STAPH—*Staphylococcus aureus*



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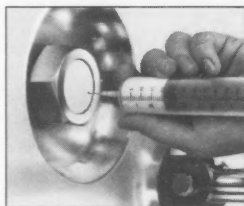


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On My Mind . . .



By
Steven K. Halstead, CAE
IAMFES
Executive Manager

is disaster planning....

In an earlier career, I was a Civil Defense Education consultant for the Iowa Department of Education. The job involved presenting adult education teacher training workshops on personal and family survival; working with schools to incorporate civil defense concepts into the curriculum; and helping schools prepare disaster plans. The funding for the job came from the Office of Civil Defense, which, after a couple of name changes is now call the Federal Emergency Management Agency (FEMA).

At the time, Iowa was on the cutting edge in terms of the materials we were using. Although the federal mandate was to concentrate on surviving a nuclear war, we felt that preparing for one disaster was much like preparing for any disaster--the scale and severity may differ, but the process was essentially the same. Thus, while it was pretty difficult to convince a school superintendent of the need to develop a school disaster plan just for a nuclear war, it wasn't at all difficult to convince him/her that they should be prepared for tornadoes, blizzards, chemical spills, gas leaks, bus accidents, and floods.

Convincing the school administrator of the need for disaster planning was one thing; getting him/her to commit that plan to paper was quite another thing. It ends up that I wrote disaster plans for a lot of Iowa schools. I look back now and shutter at the legal ramifications of what I did. What if a tornado had come along and the school had followed my plan and a child was hurt? Today there is no question but what there would have been a tremendous law

suit. In the '60s and '70s, we didn't even think about such things.

All this came back to me in mid-July as the flood waters swirled around us. As it ended up, our office was never in any real danger, we were simply inconvenienced rather greatly. But even then, I was looking at Plan "A" and thinking about plans "B" and "C" in my mind.

At the IAMFES Awards Banquet on August 4, it was announced that C. Dee Clingman had won one of the three awards given each year in recognition of the best articles published in *Dairy, Food and Environmental Sanitation*. Mr. Clingman's article "Preparing For a Disaster Before and After--An Action Plan for Food Operations" appeared in the October, 1992 issue. It begins on page 674--if you can't find it, give me a call and I'll be happy to send a reprint to you.

When I got home, I dug out Mr. Clingman's article and read it again. This time, because of the floods, his words took on special significance for me. Although the article was aimed at food service operators, the concepts are easily applied to nearly any situation. Believe me, there were a lot of food service establishments in Des Moines that could have used this information.

There are two General Mills Restaurants in Des Moines--a Red Lobster and an Olive Garden. The Olive Garden was unaffected by the floods and continued business as usual. The Red Lobster was one of the first restaurants approved to operate during the flood. Why? Because they had a plan.

If you don't, I strongly recommend you read Mr. Clingman's article and adapt it to your situation. You never know when you will need it.

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The Reliability of Pop-up Timers in Turkeys

Marilyn B. Lee, M.Sc., C.P.H.I.(C)
School of Environmental Health
Ryerson Polytechnic University 350 Victoria St.,
Toronto, Ont. M5B 2K3

This paper was presented as part of the technical session "Risk Assessment and Education" at the 80th IAMFES Annual Meeting in Atlanta, Georgia, August 1-4, 1993

Introduction

Raw turkey meat commonly harbors potentially pathogenic bacteria such as salmonellae. In a study where 320 raw turkey carcasses were sampled from federally inspected Canadian slaughterhouses, 69.1% were found positive for salmonellae. (1) If insufficiently cooked, the surviving organisms could pose a risk of foodborne disease to the consumer. Numerous cases/outbreaks have been documented where insufficiently cooked turkey was contributory to salmonellosis. (2,3,4,5,6) In Canada, Todd reported 4,588 cases of salmonellosis (1975-1984) from turkey, which represented 58% of all food vehicles. (7) Therefore, cooking turkey thoroughly is important in preventing foodborne disease, particularly salmonellosis.

One of the problems in cooking a massive product such as turkey, is in assessing doneness. Some food handlers use "rules of thumb", such as 20 minutes of cooking per pound (2) or movability of the drumstick. Sanitarians (public health inspectors) recommend more objective means such as the endpoint temperature measured by a probe thermometer.

The present study examines the usefulness of an alternative to the meat probe, namely the "pop-up" timer, in determining turkey doneness. This 2 piece plastic device, composed of a stick like shaft within a golf-tee like frame, 4.5 cm long. When a powder within the frame melts at about 82° C, a coiled spring is released and the shaft pops up. The now raised shaft indicates that the turkey is cooked.

Materials and Methods

Sixteen turkeys were purchased frozen from a local supermarket in Guelph, Ontario, and stored at -18° C (0° F) before use. Turkeys were selected, based on weight, to fall into 4 groups: 4.6 kg (10 lbs), 6.8 kg (15 lbs), 9 kg (20 lbs), and 11.3 kg (25 lbs). Before cooking, turkeys were defrosted to -1 to +3 °C (30-37° F). All turkeys were cooked individually in an uncovered turkey roasting pan in a gas-fired Hardwick oven set at 350° F. In each weight group, 2 turkeys were cooked stuffed, and the other 2 unstuffed. Stuffing for a 11 kg turkey consisted of 0.5 kg bread, 1 1/3 c water, and 1/4 cup oil. The amount was proportionally scaled down for smaller turkeys. Each turkey was cooked

with 2 pop-up timers (3M Company, Product No. 2210, for Whole Body Turkeys > 8 lbs) inserted according to manufacturer's instructions, 1 - 1/4" from the front tip of the keel bone in line with the wing socket. Sometimes an additional timer was placed slightly off position to ascertain if timer location was critical for assessing doneness. To monitor the temperature when the pop-up timers popped, a Kane-May Model KM1242 recording thermometer with 5 thermocouple probes was used. Probe tips were placed next to each pop-up timer end, in the geometric center of stuffed birds, and in the oven airspace. When a pop-up timer popped, the temperature was recorded and then immediately another probe was manually moved around to at least 7 other locations in meat (and/or stuffing) to find the lowest internal temperature. Thermocouple probes were periodically checked against boiling water. All were within 1.1° of 100.0° C.

To determine the consistency of the pop-up timers popping at similar temperatures, 6 were suspended over a hot water bath. All popped between 85.1-85.5° C.

Results and Discussion

There is some debate as to the "correct" temperature which indicates turkey doneness. The Food Safety Inspection Service of the U.S. Department of Agriculture recommends a minimum internal temperature of 82° C (180° F) (8,9) in meat while recommending 74° C (165° F) in stuffing. (10) Others have recommended a minimum of 71° C (160° F) for turkey rolls (11) or whole turkeys (12) or 74° C (165° C) for stuffing in whole turkeys (13), based on producing a microbiologically safe product. A study of survival of bacteria inoculated into turkey rolls and subsequently cooked, showed the survival of *Salmonella typhimurium*, *Staphylococcus aureus*, and *Streptococcus faecalis* at 65° C (149° F). (11) None of the organisms could be recovered when turkeys reached an endpoint of 71° C or higher. In a similar study with bacteria inoculated into stuffing of whole turkeys, salmonellae could be recovered at 60° C (140° F), but not at 71° C (165° F). (13) In addition, at least one outbreak has been documented where the endpoint internal temperature of turkey was less than 71° C (160° F). (14) Based on this evidence, in the present study an end point temperature < 71° C (160° F) was considered unsatisfactory.

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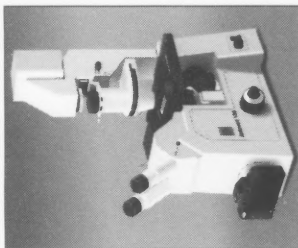
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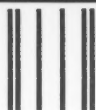
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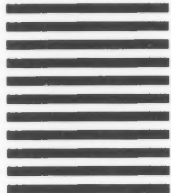
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Minimum internal temperatures of turkey when timers popped.

Each observation represents an average of 2 turkeys

OBSERVATION	WEIGHT	STUFFED	TIMER LOCATION FROM KEEL	No. of TIMERS	TEMPERATURE {°c}	MIN. INT. TEMPERATURE {°C}	COMMENTS	
1	11.3kg	y	1 1/4 "	3	86.5°	55.6°	Timers unsatisfactory	
			1 1/2 "	1	81.1°	62.8°		
2	11.7kg	n	1 "	1	83.8°	60.9°		
			1 1/4 "	2	85.0°	59.1°		
			1 1/2 "	1	80.6°	66.2°		
3	9.3kg	y	1 "	1	86.1°	75.9°		Timers unsatisfactory
			1 1/4 "	3	84.4°	59.6°		
4	8.9kg	n	1 "	2	83.7°	71.1°		
			1 1/4 "	2	84.9°	69.3°		
5	6.6kg	y	1 "	3	84.3°	61.3°	Timer satisfactory for unstuffed bird	
			1 1/4 "	1	85.8°	70.3		
6	6.4kg	n	1 "	2	84.8°	70.0°		
			1 1/4 "	2	85.7°	72.7°		
7	4.6kg	y	1 "	3	86.2°	77.7°	Timer good indicator for stuffed and unstuffed bird	
			1 1/4 "	1	85.5°	75.0°		
8	4.6kg	n	1 "	4	85.3°	76.0°		

The Table summarizes the results of the minimum internal temperature when timers popped. When large turkeys (11.3 kg, 25 lbs) were stuffed, the timers inserted according to the manufacturer's instructions popped at 86.5° C (188° F), yet the minimum internal temperatures were sometimes as low as 55.6° C (132° F). For unstuffed birds of about the same weight, correctly placed timers popped between 83.8-85° C (183-185° F), yet the minimum internal temperature was as low as 59.1° C (138° F). Pop-up timers were unsatisfactory for assessing doneness for both stuffed and unstuffed turkeys in the 11 kg (25 lbs) range.

For stuffed and unstuffed birds weighing 9 kg (20 lbs), timers popped from 83.7-86.1° C (183-187° F), while the minimum internal temperature was often less than 71° C (160° F). Again pop-up timers were unsatisfactory for stuffed and unstuffed birds of this weight.

For stuffed birds weighing 6.8 kg (15 lbs), timers popped at 84.3-85.8° C (184-187° F), while the minimum internal temperature was 61.3° C (142° F). For this weight of stuffed bird, the pop-up timer was again unsatisfactory. For unstuffed birds of 6.8 kg (15 lbs) weight, the minimum internal temperature that could be found was 70° C (158° F), close to acceptability.

For smaller turkeys, 4.6 kg (10 lbs), both stuffed and unstuffed, the minimum internal temperatures were a satisfactory 75.0° C (167° F) when timers went off. When the timers were inserted 1 1/2" away from the keel bone in the largest birds, instead of the 1 - 1 1/4" recommended distance, timers were only slightly better in indicating doneness. For example, with stuffed turkeys weighing 11.3 kg (25 lbs), the timer went off when the minimum internal temperature was 62.8° C (145° F), better than at 55.6° C (132° F), but still unacceptable.

Conclusion

The pop-up timers were very consistent, almost always going off between 83-86° C (181-187° F).

For turkeys 9 kg (20 lbs) and over, pop-up timers are an unsuitable tool for assessing turkey doneness. For smaller birds, 4.6 kg (10 lbs) and under, timers were suitable for both stuffed and unstuffed birds. For those birds in the 6.8 kg (15 lbs) range, timers would be suitable if birds were unstuffed.

Because of the variability of performance of the pop-up timers, the author would recommend that a meat probe thermometer be the best choice for indicating turkey doneness when birds are over 4.6 kg (10 lbs). The thermometer should be placed in the stuffing or thickest part of the breast. When the turkey has reached 74° C (a safety margin has been incorporated) verified by moving the meat probe to several locations, the turkey can safely be removed from the oven.

It is further recommended that stuffing be cooked separately from the interior of the bird since stuffing insulates the turkey meat from cooking quickly.

Acknowledgments

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Identification and Characterization of Heat-Resistant Psychrotrophic Bacteria in Oregon Grade A Raw Milk

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ABSTRACT

Heat-resistant psychrotrophic (sporeforming) bacteria were isolated from raw milk samples collected from 59 (9.4%) Oregon Grade A milk producers. Forty-nine (83%) milk samples contained sporeforming psychrotrophic bacteria. Isolates from 24 (40%) of the samples exhibited proteolytic properties. Heat-resistant psychrotrophic bacteria ranged from <10 to >10,000 CFU/ml for all samples. A total of 102 isolates were identified as bacilli. Twelve different *Bacillus* spp. were identified; *B. licheniformis* predominated (18% of the samples) and *B. laterosporus* was the least frequently isolated species (2%). Of the sporeformers isolated, 48% produced a bitter taste and a putrid-like odor, and 42% produced a fruity odor (off-flavor) when inoculated into sterile whole milk. Based on biochemical activity tests, 83% of the heat-resistant isolates hydrolysed casein, 56% of the isolates exhibited proteolysis in litmus milk, 57% demonstrated lipolytic activity and 31% produced acid in litmus milk. Isolates (48) that tested positive for proteolysis were evaluated quantitatively for proteinase activity in reconstituted nonfat dry milk stored for 14 d at 7.2°C; they showed a range from 0.93 to 1.93 units (expressed as mM of α -alanine). Isolates of *Bacillus cereus* var. *mycoides* demonstrated significantly higher ($p>0.05$) proteolytic activity than other *Bacillus* spp. isolate.

INTRODUCTION

Some evidence suggests that heat-resistant psychrotrophs (HRP) may simply be variants of mesophilic microorganisms that have somehow adapted to growth at lower temperatures (15). The presence of psychrotrophic (moderate growth at 7.2°C), sporeforming bacteria in raw and pasteurized milks was first reported in 1969 by Grosskopf and Harper (14) who attributed the loss of quality of pasteurized milk stored at 4°C for four weeks to the outgrowth of *Bacillus coagulans*, *B. brevis*, *B. cereus* and/or *B. licheniformis*. Since this first report, a number of

psychrotrophic *Bacillus* spp. have been isolated from raw and pasteurized milk, including: *B. brevis*, *B. cereus*, *B. cereus* var. *mycoides*, *B. circulans*, *B. coagulans*, *B. firmus*, *B. laterosporus*, *B. lentus*, *B. licheniformis*, *B. macerans*, *B. megaterium*, *B. polymyxa*, *B. pumilus* and *B. subtilis* (7, 13, 15, 18, 26, 27, 28, 34).

A range of incidence levels has been reported by various investigators for the occurrence of psychrotrophic, sporeforming bacteria in both raw and pasteurized milk and cream products. Bodyfelt (3, 22) suggested that approximately 20 to 25% of the total shelf-life problems associated with pasteurized milk and cream products conceivably could be linked to HRP bacteria. A 1986 study (4, 22) which examined Oregon Grade A raw milk for flavor quality and shelf-life potential reported HRP organisms at a level of ≥ 100 CFU/ml for 25% of the 555 samples. Martin et al. (20) found sporeforming bacteria in 99% of a set of 300 raw milk samples. In this study, of the 350 representative isolates, 94% were from the genus *Bacillus* and 6% from the genus *Clostridium*. Johnson and Bruce (18) reported thermophilic psychrotrophs in 27.2% of the raw milk samples collected from 1040 farmers in western Scotland. Of the microorganisms isolated 85% were identified as *Bacillus* spp. and 9% were assigned to the *Coryneform* group. More recently, Griffiths and Phillips (13) observed that spores of psychrotrophic bacilli (outgrowth at 7.2°C, 10d) could be isolated from 58% of farm bulk tank milks and 69% of pasteurized milk samples in Scotland.

The deteriorative effect of the thermophilic psychrotrophic bacteria on fluid milk and cream products is similar to that of other types of spoilage bacteria (e.g., bitter, putrid, unclean, stale, rancid, fruity, yeasty and/or sour off-flavors (3, 9, 10, 11, 13, 23, 34)). *Bacillus cereus* and *B. cereus* var. *mycoides* have been associated with additional defects such as "sweet curdling" in fluid milk and "bitty cream" in cream products (6, 9, 11, 18, 25, 29). The production of proteolytic and lipolytic/phospholipolytic (lecithinase) enzymes by these *Bacillus* spp. are generally assumed to be responsible for the aforementioned defects (3, 11, 13, 25). *Bacillus* spp. isolated by Johnson and Bruce (18)

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demonstrated biochemical activities pertinent to milk spoilage: 84% hydrolysed casein, 73% were proteolytic in litmus milk, 77% were lecithinase positive, 52% hydrolysed cream, and 8% fermented lactose.

The combination of thermotolerant (pasteurization survival) and psychrotrophic properties within the same microorganism represents great potential for causing spoilage in perishable milk products. Extended refrigerated storage of raw (occasionally to 72h) and pasteurized (3 to 4 weeks) milk and cream products coupled with higher pasteurization temperatures have increased the importance of heat-resistant psychrotrophs to potential shelf-life of perishable dairy products.

The objectives of this research were to identify and characterize the heat-resistant psychrotrophic bacteria isolated from Grade A raw milk samples of Oregon producers. This microbiological analysis of raw milk can often serve as an important index for projection of the shelf-life "potential" of fluid milk and cream products. Although there has been considerable effort to isolate and classify thermotolerant microorganisms in previous U.S. studies (4, 7, 10, 14, 15, 20, 27, 28, 29, 34), an examination of the extent and characteristics of heat-resistant sporeforming bacteria in a northwestern area of the U.S. had never been previously undertaken.

MATERIALS AND METHODS

Collection of (Approximately 9% of State) Raw Milk Samples

Fifty-nine milk samples were aseptically collected from the refrigerated bulk tank of milk producers located primarily in the Willamette Valley of Western Oregon. Samples were collected between November and March by state licensed milk samplers (haulers) and transported under refrigeration (4.1°C) in insulated ice chests to respective processing sites and then to our laboratory. Milk samples were stored at $\leq 2^\circ\text{C}$ prior to commencing analysis, which was conducted within 36 h of collection.

Microbiological Examination

Microbiological Analyses

Standard plate counts (SPC) and bacterial counts following laboratory pasteurization (LPC) were conducted on all raw samples per standard methods (27). A test modification was employed for conducting the Psychrotrophic Spore Forming Count (PSC) and the Proteolytic Psychrotrophic Sporeformer Count (PPSC) (27). Approximately 15 ml of raw milk were transferred aseptically to sterile 15 mm diam screw cap test tubes, heat-treated ("heat shocked") for 10 min at 80°C (excluding the heating "come-up" time) and cooled immediately in an ice water bath (10, 23). Treated samples were incubated at 7.2°C for 10 d. The heat treatment was applied in an 80°C water bath equipped with a shaker (New Brunswick Scientific Co.). The water bath temperature was monitored by use of a thermometer inserted into a control sample tube. Following the incubation period, plates of appropriately diluted samples were prepared and incubated for 72 h at 21°C. The colonies observed were recorded as the laboratory pasteurization count (LPC). All plating procedures were conducted with standard methods agar (Difco, Detroit, MI).

The heat-shocked samples were incubated for 10 d at 7.2°C. The casein agar method was used to determine PPSC (27). Standard methods agar (SMA) was used to enumerate psychrotrophic sporeforming bacteria (PSC). Plates were incubated at 21°C for 72 h and counted. Colonies surrounded by a white zone or halo of casein precipitate were considered proteolytic and recorded as the Proteolytic Psychrotrophic Sporeformer Count (PPSC).

Identification of Isolated Microorganisms

Statistical selection techniques recommended by Harrigan and McCance (16) were used to select bacterial colonies from the PSC and PPSC plates. Selected colonies were streaked onto SMA for isolation and subsequent genus and species identification. Cellular and colony morphology, and physiologic and selected biochemical tests (Table 1) were used to identify proteolytic and non-proteolytic sporeforming psychrotrophs (5, 13, 31). The diagnostic key of Skerman (31) and Gordon et al. (12) and the standard taxonomic procedures and descriptions from *Bergey's Manual of Determinative Bacteriology* (5) were also used for micro-identification.

Reference strains to confirm results of biochemical tests of isolates were obtained from the American Type Culture Collection, Rockville, MD. Strains obtained included *Bacillus cereus* ATCC 14579, *B. circulans* ATCC 4513, *B. subtilis* ATCC 6051, and *B. megaterium* ATCC 4513.

Preparation of Spore Suspensions

Colonies isolated from proteolytic and non-proteolytic plates were subsequently inoculated into nutrient broth

Table 1. Physiological and biochemical tests used to identify and characterize thermotolerant psychrotrophs.^{1,2}

Gram stain reaction	Growth at pH 5.7
Presence of spores	Growth at pH 9.6
Cell & colony morphology	Growth at 45° and 65°C
Anaerobic growth	Hydrolysis of starch
Catalase production	Hydrolysis of arginine
Voges-Proskauer test	Decomposition of casein
Final pH of V-P broth	Reaction in litmus milk
Growth in 0, 5, 7, & 10% NaCl	Production of indole
Acetyl methyl carbinol production	Reaction of nitrate to nitrite
Acid production from:	Deamination of phenylalanine
Arabinose	Utilization of propionate
Fructose	Utilization of citrate
Glucose	Lipolytic activity
Glycerol	Growth in milk plus 10% methyl, blue
Mannitol	Growth in broth plus 40% bile
Sorbitol	Liquefaction of gelatin
Trehalose	
Xylose	

¹American Soc. Microbiology 1981 (1).

²Gordon et al. 1973 (12)

(Difco), incubated for 48 h at 30°C, and then used to inoculate (0.5% v/v) sterile commercial whole milk (125 ml). The whole milk had been heat treated for 30 min at 63°C to germinate spores and then autoclaved (15 min at 82.7 Kg/m² (12 psi)). The number of cells contained in the inoculum was not determined.

Determination of Proteolytic Activity

Bacilli isolates that initially tested positive for proteolysis were examined for extent of proteolytic activity. Isolates that had been stored on SMA slants at 7.2°C were used to inoculate 5 ml of nutrient broth, which was then incubated for 48 h at 30°C to produce actively growing cells. Five ml of cell-containing broth were added aseptically to 20 ml of nutrient broth, which was incubated at 30°C for 48 h in a shaker water bath. Following incubation, the broth containing cells was centrifuged, the cells were washed, recentrifuged, and resuspended in dilute 0.1% peptone water (Difco). Cell numbers were standardized by prior optical density readings on a Bausch and Lomb Spectronic 20 at 600 nm and plate counts were conducted on the diluted cell suspension. Approximately 3.0 x 10⁵ CFU/ml were used to inoculate 50 ml of 11% (v/v) sterile nonfat dry milk (NDM). The inoculated samples were then stored for 14 d at 7.2°C. After inoculation, 5 ml portions were used to 3 determine proteolytic activity by the method of Church et al. (8). The statistical analysis system (SAS Institute, Inc., Cary, NC) was used to compare and evaluate the mean proteolytic activity measurements. The Duncan procedure (SAS) was used to execute the least significant difference test (p > 0.05).

Sensory Evaluation of Milk Samples

Three trained and experienced persons served as judges to conduct independent flavor evaluations of inoculated and incubated milk samples for presence or absence of off-odor, possible coagulation and taste, if deemed appropriate. Milk samples were tempered to 13°C and about 20 ml of milk poured into 75 ml plastic cups. Each judge noted the odor and taste characteristics of each coded sample and recorded observations in terms of appropriate sensory descriptors.

RESULTS AND DISCUSSION

Plate Counts for Raw Milk Samples

Standard plate count results for the 59 bulk tank raw milk samples are summarized in Table 2. The initial SPC's ranged from <100 to 96,000 CFU/ml; 86% of the raw milk samples exhibited counts < 20,000 CFU/ml. All the raw samples met the USPHS/FDA requirements for Grade A raw milk (i.e. < 100,000 CFU/ml). The SPC results for the raw milk samples after the pasteurization procedure (LPC) are summarized in Table 2. All LPC counts met the requirements for Grade A pasteurized milk (i.e. ≤ 20,000 CFU/ml).

The psychrotrophic sporeformer (HRP) counts and the proteolytic psychrotrophic sporeformer (PPSC) counts for the raw milk are also included in Table 2. These microbial counts reflect survivor growth during the post-heat shock incubation period (10 d at 7.2°C). Bacterial counts obtained immediately following the 80°C heat-shock treatment would have included any viable cells or spores able to survive and

Table 2. Plate counts of 59 raw and "heat shocked" milk samples obtained from Oregon milk producers.

Milk Type	Plating Procedure	Count (CFU/ml)	No. of Samples	Total %
Raw Milk	SPC	<5,000	27	46
		5,000-50,000	30	51
		>50,000	2	3
Pasteurized Milk	SPC (LPC)	<100	32	54
		100-1,000	20	34
		>1,000	7	12
	PSC ¹	<100	36	61
		100-500	7	12
		500-10,000	7	12
		>10,000	9	15
	PPSC ²	<100	45	76
		100-500	4	7
		500-10,000	4	7
		>10,000	6	10

¹Psychrotrophic Sporeformer Count (PSC). Samples heat-shocked at 80°C for 10 min and incubated at 7.2°C for 10 d, followed by plating on Standard Methods Agar for 48 to 72 h at 21°C.

²Proteolytic Psychrotrophic Sporeformer Count (PPSC). Same sample treatment as PSC, but plated on Casein-Agar for 48 to 72 h at 21°C.

recover from the heat treatment. Standard Methods for the Examination of Dairy Products (27) recommends plating samples immediately following heat treatment (80°C for 12 min), followed by incubation of plates at 7.2°C for 10 d. However, in our study aliquots of the heated milk samples were incubated at 7.2°C for 10 d and then plated for PSC. These investigators felt that by permitting the spores to germinate and the subsequent outgrowth of vegetative cells within the milk sample served to more closely simulate the environmental and nutrient conditions that occur in commercial handling and distribution of milk. Microbial counts obtained at day 0 would not have taken into account injured cells which generally require an extended lag growth phase prior to outgrowth on a supportive medium; this obviously would result in lower plate counts. The 80°C, 10 min heat-shock treatment, followed by an incubation period (10 d at 7.2°C) is perhaps more selective in that the majority of typical microbial survivors represent sporeforming bacteria that were psychrotrophic in nature. The longer lag phases and generation times characteristic of psychrotrophic bacteria were felt to justify use of the 10 day incubation period.

Sporeforming psychrotrophs were found in 49 of 59 samples (83%); counts ranged from < 10 to > 10,000 CFU/ml. Mikolajcik and Simon (23) determined the psychrotrophic sporeformer counts of 51 raw milk samples, following 7 days storage at 7°C and reported a range from <1 to >10,000 CFU/ml. These investigators found psychrotrophic counts >10 CFU/ml in 58% of their samples. Sharma et al. (28) reported that the psychrotrophic spore count of 51 raw milk samples ranged from < 1 to > 100 CFU/ml after incubation of heat-shocked samples at 7°C for 7 d. Sporeforming psychrotrophs were found in 92% of their samples.

The proteolytic psychrotrophic sporeformer counts (PPSC) for the raw milk samples in our study are shown in Table 2. The PPSC's on the raw milk, following heat

treatment and incubation (10 d at 7.2°C), ranged from < 10 to >10,000 CFU/ml. Standard Methods (27) suggests that plates containing proteolytic counts in excess of 80 CFU/plate are not generally considered readable. In this study, the plates that contained >100 CFU/plate were difficult to read; hence, estimated counts had to be reported in many instances. Proteolytic psychrotrophic sporeformers were found in 73% of all raw milk samples. Sharma et al. (28) reported a 78% incidence rate of proteolytic sporeformers in their set of 51 raw milk samples.

Identification of Microorganisms

The identity and frequency of occurrence of psychrotrophic sporeformer organisms isolated from both raw and commercially processed milk samples analyzed in this study are summarized in Table 3. Twelve different species of *Bacillus* were identified from 102 total bacilli isolates. *Bacillus licheniformis* was the most common species isolated (19% of the samples). Psychrotrophic spore forming bacteria isolated from raw milk by Chung and Cannon (7) were identified as *Bacillus firmus* (43.6%), *B. megaterium* (23%), *B. brevis* (15.7%) and the remainder as *B. coagulans*, *B. polymyxa*, *B. macerans*, *B. circulans*, and *B. cereus*. Johnson and Bruce (18) identified *Bacillus* spp. isolated from laboratory pasteurized raw milk as follows: *B. cereus* (65.7%), *B. licheniformis* (19.9%), *B. coagulans* (10.1%) and the remainder *B. megaterium*, *B. circulans*, *B. polymyxa*, *B. brevis*, and *B. macerans*.

Contrary to most other investigations of sporeforming psychrotrophs, no *Bacillus cereus* were isolated and identified from the Oregon raw milk samples examined in this study. Although some investigators have isolated *B. cereus* strains capable of growth at 7°C, Bergey's Manual (5) indicates a minimum growth temperature for *B. cereus* of 10°C for 86% of the strains examined, with no growth evident at 5°C.

The *Bacillus* spp. listed in Table 3 closely matched the respective morphological, microbiological, and biochemical characteristics for each *Bacillus* spp. discussed by Gordon et al. (12) and Bergey's Manual (5). Though our *Bacillus* spp. isolates did not match identically with all the specific characteristics listed in the two aforementioned references, the appropriate morphological and microbiological charac-

teristics (with the exception of lower growth temperatures) were consistent for each species. All *Bacillus* spp. observed in this study, with the exception of *B. brevis*, *B. coagulans*, *B. laterosporus*, and *B. licheniformis*, are capable of growth at 10°C, according to Bergey's Manual (5). It is perhaps notable that all of the bacilli isolates in this study were capable of growth at 7.2°C. Bergey's Manual (5) also states that only two of the *Bacillus* spp. isolated and identified in this study are capable of growth at 5°C, *B. polymyxa* and *B. megaterium*. Shehata and Collins (29) identified *B. subtilis*, *B. circulans*, and *B. coagulans* strains that were capable of outgrowth within two weeks storage at 0°C. These researchers also isolated strains of *B. brevis*, *B. cereus*, *B. laterosporus*, *B. circulans*, *B. macerans*, *B. megaterium*, *B. licheniformis*, *B. polymyxa*, *B. pumilus* and *B. subtilis* that exhibited minimum growth temperatures of 5 to 7°C. The observed differences in minimum growth temperatures for *Bacillus* spp. isolates in our study illustrates the relative importance of studying the various environmental factors and milk handling practices that apparently contribute to the ability of mesophilic *Bacillus* spp. to adapt to low temperature growth. Hence, recent changes in refrigeration and cold storage conditions for milk production, storage, and processing may have served to select for psychrotrophs in milk (3, 22).

The biochemical characteristics which were most variable across isolated *Bacillus* spp. included: (1) hydrolysis of starch; (2) decomposition of casein and tyrosine; (3) acetylmethyl carbinol production; and (4) production of acid.

Besides the bacilli isolates, 18 different thermophilic cocci were isolated in this study, and subsequently identified as *Micrococcus luteus*, *M. varians*, *Enterococcus faecalis*, and *Lactococcus lactis* ssp. *maltigenes*. These particular organisms have been isolated previously and reported in studies of raw and pasteurized milk samples (32, 34). These 18 cocci, along with selected bacilli isolates, were retested for their ability to survive both a simulated HTST pasteurization (68°C for 16 s) and "heat-shock" treatment (80°C for 10 min) and subsequent outgrowth at refrigeration temperatures (7.2°C). All the retested *Bacillus* spp. survived both heat treatments and exhibited growth at 7.2°C. All 18 of the thermophilic cocci survived the HTST pasteurization treatment and grew subsequently at 7.2°C, but only two of the cocci isolates survived the "heat-shock" treatment. Both isolates were identified as *Lactococcus lactis* ssp. *maltigenes*. The characteristics of these two isolates closely matched the description in Bergey's Manual (5) for *S. lactis*, except that they failed to grow in 40% bile. These two isolates were identified as *L. lactis* ssp. *maltigenes* based on their ability to produce a distinct malty off-flavor when inoculated into sterile whole milk (24). This characteristic was tested and demonstrated twice over a three month interval. The two *L. lactis* ssp. *maltigenes* cultures were isolated from separate raw milk samples, but within the same producer organization.

Effects and Activity of Psychrotrophic Sporeformers in Milk

Table 4 summarizes various flavor defects observed and associated with thermophilic isolates from raw milk samples

Table 3. Species identification of psychrotrophic, sporeforming bacilli isolated from raw milk samples.

Organism	No. of Samples	% Total Samples
<i>Bacillus licheniformis</i>	11	19
<i>B. pumilus</i>	9	15
<i>B. megaterium</i>	6	10
<i>B. brevis</i>	5	9
<i>B. circulans</i>	5	9
<i>B. polymyxa</i>	5	9
<i>B. sphaericus</i>	5	8
<i>B. cereus</i> var. <i>mycoides</i>	4	7
<i>B. macerans</i>	3	5
<i>B. firmus</i>	2	3
<i>B. coagulans</i>	1	2
<i>B. laterosporus</i>	1	2

in this study. The flavor defects produced in milk by bacilli proteinases were similar to the off-flavors noted by other investigators (9, 10, 23, 34). Of the bacilli isolates, 58% were judged to produce a bitter taste and/or putrid odor, which is indicative of proteolytic enzyme activity. The remainder of the bacilli isolates tended to produce either fruity, rancid or yeasty off-flavors, which is more indicative of lipolytic activity. The production of proteolytic and lipolytic enzymes is known to vary with bacilli (12, 30). In this study, *B. circulans* and *B. coagulans* were observed to produce both fruity and rancid off-flavors. However, our *B. laterosporus* isolate produced distinct bitter and unclean off-flavors. Washam et al. (34) also isolated a *B. laterosporus* that produced bitter and unclean off-flavors as well as "sweet curdle" (milk coagulation). The flavor defects produced by the thermophilic cocci are also listed in Table 4. *Micrococcus luteus* tended to produce a rancid off-flavor in sterilized whole milk (incubated at 7.2°C), while *L. lactis* ssp. *maltigenes* produced a malty off-flavor. Specific strains of *L. lactis* have been known to produce a malty off-flavor in certain dairy products by metabolizing leucine to 3-methyl butanal (5, 24).

Of the 102 bacilli isolates in our study, 48 were positive for proteolysis on casein agar plates. This group of isolates was further analyzed for proteolytic activity by the method of Church et al. (8). The relative proteolytic activities of *Bacillus* spp. isolated from milk samples (expressed as mM of alanine) are summarized in Table 5. *Bacillus cereus* var. *mycoides* (group A) demonstrated significantly higher proteolytic activity, while *B. pumilus* (group E) demonstrated significantly less proteolysis than the other *Bacillus* isolates. Four of the *Bacillus* species were placed in both groups B and C.

Sharma et al. (28) used a modification of the proteolytic assay of Keay and Wildi (19) and determined that the proteolytic activity of 50 psychrotrophic *Bacillus* isolates ranged from 20 to 480 units/ml, wherein one unit of enzyme activity was defined as the amount of enzyme required to release sufficient TCA-soluble fragments to produce a blue color equivalent to 1 mg of tyrosine/hr at 37°C. Chopra and Mathur (6) found that the proteolytic activity of 171 ther-

Table 5. Proteolytic activity of *Bacillus* spp. isolated from milk samples expressed as mM of alanine.¹

Organism	No. of Isolates	Proteolytic Activity Mean ± SD ² (mM of α-alanine) ³
<i>Bacillus brevis</i>	4	1.24 + 0.044 ^c
<i>B. cereus mycoides</i>	9	1.93 + 0.065 ^a
<i>B. circulans</i>	2	1.32 + 0.042 ^{b,c}
<i>B. coagulans</i>	2	1.10 + 0.035 ^d
<i>B. firmus</i>	3	1.08 + 0.081 ^d
<i>B. licheniformis</i>	5	1.33 + 0.073 ^b
<i>B. megaterium</i>	4	1.32 + 0.051 ^{b,c}
<i>B. polymyxa</i>	8	1.28 + 0.066 ^{b,c}
<i>B. pumilus</i>	9	0.93 + 0.057 ^e
<i>B. sphaericus</i>	3	1.25 + 0.053 ^{b,c}

¹Church et al. (8)

²Means with the same letter are not significantly different from each other at the p>0.05 level using the least significance difference test.

³Proteolytic activity based on mM of α-alanine (units) developed by cultures inoculated into sterile reconstituted NDM and stored for 14 d at 7.2°C.

moduric isolates ranged from 20-500 units/ml; all 50 isolates that exhibited >100 enzyme units/ml belonged to the genus *Bacillus*.

Our results indicate that under the given growth conditions, *Bacillus* spp. seemed to exhibit different levels of proteolytic activity. We did not attempt to determine whether this variation in activity was due to faster growth rates of some isolates (more cells produce more enzyme) or greater rates of enzyme production. Distinguishing between these possibilities could be a focus of a future study.

The assay conditions employed in this study involved the inoculation of washed cells (3.0 x 10⁵ organism/ml) into reconstituted sterile nonfat dry milk, followed by incubation at 7.2°C for 14 d. The inoculum was chosen to obtain cells presumed to be in the exponential growth phase, where enzyme production and cell growth should have been optimal. The selected incubation temperature and time period simulated typical storage conditions of milk products. The incubation time was also selected based on previous trials of 5, 7, and 10 d which resulted in activity levels too low to be measured accurately for many of the isolates.

The Church et al. (8) method to measure proteolytic activity was adequate but was not without limitations. The reagents in this method form an adduct with the α-amino groups of amino acids, peptides, and polypeptides; the end products of protein degradation. Most of the inoculated milks had developed strong off-tastes and odors (primarily bitter and putrid, respectively) before proteolytic activity could be detected by the Church et al. (8) method. The development of improved assays for isolation and quantitation of protease (as well as lipolytic and phospholipolytic enzymes) could expedite the assessment of proteolytic activity of potential spoilage microorganisms in milk and milk products.

Additional research is needed to improve quantitative assays of proteinase, lipase, and phospholipase activities of heat-resistant psychrotrophs in milk. A better understanding of the conditions under which this enzymatic activity occurs could prove most useful in considering alternative pasteurization or ultra-high pasteurization procedures which should

Table 4. Flavor and odor defects associated with isolates from raw and pasteurized milk samples inoculated into sterile whole milk and incubated at 7.2°C for 14 d.

Organism	Defect
<i>Bacillus brevis</i>	bitter, putrid, unclean
<i>B. cereus mycoides</i>	bitter, putrid
<i>B. circulans</i>	fruity, rancid, yeasty
<i>B. coagulans</i>	fruity, rancid, yeasty
<i>B. firmus</i>	fruity, yeasty
<i>B. laterosporus</i>	bitter, unclean
<i>B. licheniformis</i>	bitter, putrid
<i>B. macerans</i>	bitter, putrid
<i>B. megaterium</i>	bitter, putrid
<i>B. polymyxa</i>	fruity, rancid, yeasty
<i>B. pumilus</i>	bitter, unclean
<i>B. sphaericus</i>	sour, rancid, unclean
<i>Micrococcus luteus</i>	rancid
<i>M. varians</i>	bitter, putrid
<i>Enterococcus faecalis</i>	bitter, putrid
<i>Lactococcus lactis</i> ssp. <i>maltigenes</i>	malty

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help maximize the shelf-life potential of perishable milk products. Additionally, development of rapid and sensitive methods for measuring the presence of these enzymes in either raw or pasteurized milk conceivably could be used as a practical indicator of potential shelf-life. The optimum temperature for psychrotrophic microorganisms to produce enzymes (lipases, proteinases, and carbohydrases) is usually lower than the optimum temperature for cell outgrowth (33). Hence, there is sufficient opportunity for refrigerated milk stored for several days to develop off-flavors induced by microbial enzymes, even though the bacterial population may be below that commonly associated with microbial defects. With the increasing tendency or need to store milk and milk products for longer periods of time, the deleterious role of heat-resistant psychrotrophic bacteria is certain to have a greater impact on product quality.

This study confirmed that a considerable amount of the Grade A raw milk in Oregon contains heat-resistant sporeforming psychrotrophic bacteria, especially *Bacillus* spp., and was the first to examine their incidence, identity and characteristics. These observations may have implications for the rest of the U.S. fluid milk industry.

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Effect of Salt on the Production of Citric Acid from Whey as a Means for Pollution Control in Domiati Cheese Manufacture

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ABSTRACT

Two strains of *Aspergillus niger*, i.e. *A. niger* CAIM 111 and *A. niger* CAIM 167, were used to produce citric acid from salt whey as a means to prevent environmental pollution when salt whey from the manufacture of Domiati cheese, a national type of soft cheese in Egypt, is disposed of as a waste. The chemical oxygen demand (COD) and biological oxygen demand (BOD) of salt whey can be reduced up to 77.8 and 76.3%, respectively, via fermentation of salt whey to citric acid by *A. niger* strains, when the whey medium had 4% methanol and the pH was adjusted at 3.5. This study showed that using salt whey as a substrate for the production of citric acid by *A. niger* strains CAIM 111 and CAIM 167 can be considered a possible technique for utilizing this by-product for a beneficial purpose as well as a pollutant load reducer.

INTRODUCTION

Whey was defined by Jones (12) as the serum or watery part of milk separated from the more thick or coagulated part or curd, especially in the process of making cheese. When whole milk is used to produce rennet-coagulated cheeses such as Cheddar cheese, the resultant fluid by-product is called sweet whey with a pH range from 5.0 to 7.0. The manufacture of acid-coagulated cheeses such as Cottage cheese gives a fluid by-product called acid whey with a pH range from 4.0 to 5.0. Making of Domiati cheese, a native type of soft cheese in Egypt, from milk which has 6 to 12% salt added before renneting gives a salt whey as a by-product of such cheese, that contains as high as 10% salt (9).

The production of whey has increased worldwide. At the same time, the costs of environmental pollution control is going up. Therefore, efforts are warranted to find a satisfactory solution to solve the problem of surplus whey. Cheese whey has an important biological and nutritive value, in addition to its contents of lactose and whey proteins, it can be a good source of several vitamins and minerals. Therefore, whey is considered as an organic pollutant, and the biological oxygen demand (BOD₅) of untreated whey ranges from 30 - 60 g/L depending primarily on the specific cheesemaking process used (19,20).

Disposal of whey using any of the traditional methods can be a source for environmental pollution that increase the biological oxygen demand (BOD) as a result of the presence

of tremendous concentrations of organic substances (2,11,12,13). Also, because whey contains high levels of nitrogen, phosphorus and some other minerals, it must be managed carefully when used for land irrigation (19). Moreover, cheese whey can cause serious problems even when dumped directly into the municipal sewage system because of its high BOD₅ (11).

In Egypt, cheese production utilizes more than 70% of the milk being produced and the amount of salt whey being produced is ranged from 7.3 to 7.9 times more than that of recorded for sweet whey (10). It means that substantial amounts of salt whey are produced in the country. At the same time, salt whey cannot be used in food for human consumption because of its high content of sodium chloride (10%), therefore, salt whey is a product for which use would be important (9). Some trials have been done to utilize salt whey as fermentation medium for the production of single cell protein (6,9,17,21) or citric acid (7).

The objective of this paper was to investigate the effect of the presence of salt as sodium chloride in whey on the production of citric acid by selected strains of *Aspergillus niger* as a means for pollution control in the cheese industry.

MATERIALS AND METHODS

Microorganisms

Aspergillus niger strains CAIM 111 and CAIM 167 were obtained from the Microbiological Resource Center (Cairo MIRCEN), at the Faculty of Agriculture, Ain Shams University, Cairo, Egypt. These strains were negative for the production of aflatoxins B₁ and G₁, and exhibited a high ability to utilize lactose in cheese whey for producing citric acid (8). Stock cultures were maintained on potato dextrose agar slants at 4°C.

Preparation of spore suspension

Inocula for fermentation process were prepared by growing the strain under test on potato dextrose agar at 30°C for 5 days. Spore suspensions were prepared by adding 10 ml of sterile 0.05 Tween 80 solution to the slants and shaking gently for 1 min (18). The counts of the spores in the spore suspensions of the investigated strains were measured using the method outlined in the APHA (1).

Preparation of fermentation medium

Fresh Ras cheese whey (sweet whey) was obtained from Cairo Dairy Plant, Misr Milk and Food Co., Cairo, Egypt. Whey was boiled for 30 min to denature and precipitate most of the whey proteins (4). The precipitated whey protein was separated, and the supernatant was filtered through cheese cloth to remove the balance of any minute amounts of protein. The pH of deproteinized whey was adjusted to 3.5 using lactic acid, and methanol was added at level of 4%, v/v (8). Aliquots of 100 ml of deproteinized whey were dispensed into 500-ml Erlenmeyer flasks and sterilized at 121°C for 15 min.

Composition of fermentation medium

The gross composition of fresh and deproteinized sweet whey used as a fermentation medium is shown in Table 1. They were analyzed for total solids, fat and titratable acidity (14), protein and ash (4), lactose (5), chemical oxygen demand (COD) and biological oxygen demand (BOD₅) (16) and pH (using a pH-meter with a glass electrode, Model CG 822, Germany).

Effect of salt during the fermentation process

Prewheighed amounts (2, 4, 6, 8, 10 or 12%) of sterilized salt were added to individual flasks containing 100 ml of sterilized deproteinized whey (pH 3.5, methanol concentration 4%, v/v). A flask of unsalt sterilized fermentation medium was served as a control. The flasks were inoculated with 1 ml of the spore suspension (approximately 30 x 10⁶ to 45 x 10⁶ spores), and incubated at 30°C in a Kottermann shaking water bath with an operating speed of 150 rpm. Samples of broth were aseptically removed at 0, 3, 6, 9, 12, and 15 day intervals and immediately analyzed for citric acid concentration (15), COD and BOD₅ (16). COD reduction and BOD₅ reduction were estimated as indicators for the reduction of pollution created from salt whey.

Three replicates were carried out and analyzed for each treatment.

RESULTS AND DISCUSSION

The effect of salt concentration in deproteinized whey on the efficiency of *A. niger* CAIM 111 to produce citric acid is presented in Table 1. It is obvious that the highest amount of citric acid was produced after 9 days of fermentation period at all levels of salt concentration. The maximum citric acid concentration (1.30 g/L) was achieved in unsalt whey, while the lowest amount of citric acid was produced in the

Table 1. Gross composition of whey used as a fermentation medium.

Item	Fresh whey	Deproteinized whey
pH	5.40	5.40
Titratable acidity (%)	0.36	0.36
Lactose (%)	4.90	4.10
Protein (%)	0.70	0.30
Fat (%)	0.20	0.00
Ash (%)	0.70	0.56
Total solids (%)	6.50	4.96
COD (g/L)	45.00	27.00
BOD ₅ (g/L)	45.00	26.00

whey contained 2% salt. *A. niger* CAIM 111 proved the ability to grow in the presence of 8, 10, and 12% salt and produced 0.95, 1.00 and 0.94 g/L citric acid, respectively.

As regard to the effect of salt concentration in cheese whey on the activity of *A. niger* CAIM 167, the maximum amount (3.10 g/L) of citric acid was recorded when the fermentation medium had 10% salt followed by 12, 8, 6, 4, and 2%, in this decreasing order. The minimum quantity (1.00 g/L) of citric acid was produced from whey without salt (Table 2). Regardless the salt concentration, the highest amount of citric acid was produced after 9 days of the fermentation period. These results are in agreement with those reported by Somkuti and Bencivengo (18), who found that the maximum concentration of citric acid was usually achieved after 8-12 days of fermentation.

Fermentation of salt deproteinized whey using *A. niger* CAIM 111 to produce citric acid reduced the chemical

Table 2. Effect of salt concentration on the activity of *A. niger* CAIM 111 during the fermentation of whey^a to citric acid.

Salt conc. (%)	Fermentation period (days)	Citric acid conc. (g/L)	COD (g/L)	COD Reduction (%)	BOD ₅ (g/L)	BOD ₅ Reduction (%)
0	3	0.10	19.0	29.6	17.0	34.6
	6	0.34	18.0	33.3	15.0	42.3
	9	1.30	15.0	44.4	13.0	50.0
	12	0.81	13.0	51.9	12.2	53.1
	15	0.14	11.0	59.3	10.0	61.3
2	3	0.10	26.0	3.7	25.0	3.8
	6	0.27	22.0	18.5	21.5	16.2
	9	0.52	17.0	37.0	15.0	42.3
	12	0.33	11.0	59.3	9.5	63.5
	15	0.09	10.0	63.0	9.0	65.4
4	3	0.14	24.0	11.1	22.8	12.3
	6	0.20	20.0	25.9	18.0	30.8
	9	0.60	17.0	37.0	15.2	41.5
	12	0.34	13.0	51.9	12.3	52.7
	15	0.24	11.0	59.3	9.5	63.5
6	3	0.16	23.8	11.9	22.3	6.4
	6	0.23	21.0	22.2	19.0	26.9
	9	0.64	15.1	44.0	14.3	45.0
	12	0.35	10.5	61.1	10.0	61.5
	15	0.18	10.0	63.0	9.3	64.2
8	3	0.19	24.8	8.1	23.0	11.5
	6	0.33	23.0	14.8	21.0	19.2
	9	0.95	19.0	29.6	16.8	35.4
	12	0.76	11.0	59.3	9.5	63.5
	15	0.34	10.0	63.0	9.3	6
10	3	0.44	24.0	11.1	22.8	12.3
	6	0.76	21.0	22.2	19.3	25.8
	9	1.00	17.0	37.0	15.0	40.7
	12	0.88	11.0	59.3	10.0	61.5
	15	0.59	10.2	62.2	9.3	64.2
12	3	0.37	25.3	6.3	24.0	7.7
	6	0.86	23.4	13.3	22.8	12.3
	9	0.94	17.8	34.1	15.3	41.2
	12	0.70	10.5	61.1	9.8	62.3
	15	0.44	10.0	63.0	9.0	65.4

^aInitial lactose concentration: 41.0 g/L, Initial pH: 3.5, Initial methanol concentration: 4%.

oxygen demand (COD) and the biological oxygen demand (BOD₅) of such medium (Table 2). In regard to the unsalt whey, the COD reduction ranged from 29.6% after 3 days, to 59.3% after 15 days, while the BOD₅ reduction varied between 34.6% after 3 days, and 61.3% after 15 days. At all levels of the added salt, the COD and BOD₅ reduction was little until the ninth day of the fermentation period compared to that noticed for unsalt medium (Table 2).

At the end of the fermentation period, the COD reduction ranged from 59.3% at a level of 4% salt to 63% at the levels of 2, 6, 8, and 12% salt, while the BOD₅ reduction ranged from 63.5% when the medium had 4% salt to 65.4% when the concentration of salt was 2 or 12% (Table 2).

Table 3 shows the effect of different salt concentration on the reduction occurred in the COD and BOD₅ of deproteinized whey during the production of citric acid by *A. niger* CAIM 167. The COD and BOD₅ reduction exhib-

Table 3. Effect of salt concentration on the activity of *A. niger* CAIM 167 during the fermentation of whey^a to citric acid.

Salt conc. (%)	Fermentation period (days)	Citric acid conc. (g/L)	COD (g/L)	COD Reduction (%)	BOD ₅ (g/L)	BOD ₅ Reduction (%)
0	3	0.08	23.0	14.8	22.0	15.4
	6	0.32	22.0	18.5	20.0	23.1
	9	1.00	19.0	29.6	17.0	34.6
	12	0.60	17.0	37.0	15.0	42.3
	15	0.19	13.0	51.9	12.2	51.1
2	3	0.70	26.0	3.7	25.0	3.8
	6	1.10	20.5	24.1	18.0	30.8
	9	1.30	17.0	37.0	15.3	41.2
	12	0.30	15.0	44.4	12.9	50.4
	15	0.13	11.0	59.3	9.5	63.5
4	3	0.74	25.5	5.6	24.0	8.0
	6	1.16	23.0	14.8	22.0	15.4
	9	1.54	16.5	38.9	14.5	44.2
	12	0.22	13.0	51.9	12.2	53.1
	15	0.11	10.5	61.1	10.0	61.5
6	3	1.42	25.2	6.7	24.5	5.8
	6	1.71	20.5	24.1	18.0	30.8
	9	2.02	16.0	40.7	14.0	46.2
	12	0.82	14.0	48.1	13.0	50.0
	15	0.20	11.0	59.3	10.0	61.5
8	3	1.18	26.0	3.7	25.0	3.8
	6	1.54	20.0	25.9	19.0	26.9
	9	2.05	16.0	40.7	14.0	46.2
	12	0.70	13.0	51.9	12.0	53.8
	15	0.29	10.5	61.1	9.8	62.3
10	3	1.54	25.0	7.7	24.0	7.7
	6	2.40	23.0	14.8	22.0	15.4
	9	3.10	16.0	40.7	14.3	45.0
	12	0.94	13.0	51.9	12.0	53.8
	15	0.48	10.5	61.1	9.6	63.1
12	3	1.31	25.4	5.9	24.2	6.9
	6	1.56	20.0	25.9	18.0	30.8
	9	2.70	16.5	38.9	14.5	44.2
	12	0.64	11.0	59.3	9.5	63.5
	15	0.39	10.0	62.9	9.0	65.4

^aInitial lactose concentration: 41.0 g/L,
Initial pH: 3.5,
Initial methanol concentration: 4%

ited a similar trend to that of observed for *A. niger* CAIM 111. Also, the COD and BOD₅ reduction was more in unsalt whey than in salt whey, at all levels of salt, during the first three days of fermentation, then the reduction tended to be more in the salt whey until the end of the fermentation period. At the end of the fermentation period, the COD reduction ranged from 59.3, at 2 or 6% salt, to 62.9% at a level of 12% salt. While the BOD₅ reduction varied from 61.5%, at a level of 4% salt, to 65.4% at a level of 12% salt (Table 3).

Mention should be made that the COD and BOD₅ reduction had been occurred during the fermentation of the unsalt or salt deproteinized whey resulted from the activity of *A. niger* CAIM 111 or *A. niger* CAIM 167 to produce citric acid did not represent all the COD and BOD₅ reduction during the entire process. Also, some of the COD and BOD₅ reduction happened during the preparation of whey as a fermentation medium, i. e. deproteinization of whey, should be considered. The chemical oxygen demand (COD) and biological oxygen demand (BOD₅) of the fresh whey were 45 and 38 g/L, respectively, while the deproteinized whey which used as a fermentation medium for the production of citric acid by *A. niger* strains, had less COD and BOD₅, i.e. 27 and 26 g/L, respectively. The treated whey always has lower COD and BOD₅ than the untreated whey. It means that the deproteinization process of whey during the preparation of whey as a fermentation medium caused 40 and 31.6% reduction of the COD and BOD₅, respectively.

The overall COD and BOD₅ reduction should be calculate on the basis of the original COD and BOD₅ of whey before the preparation. Table 4 indicates the overall COD and BOD₅ reduction at the end of the fermentation period of whey to produce citric acid by *A. niger* CAIM 111 and *A. niger* CAIM 167. The overall reduction of COD and BOD₅ caused by *A. niger* CAIM 111 ranged from 75.6 to 77.8%, and from 73.7 to 76.3%, respectively. While, the overall reduction of COD and BOD₅ caused by *A. niger* CAIM 167 varied from 71.1 to 77.8% and from 67.9 to 76.3, respectively. This range includes all concentration of salt from zero to 12%.

Table 4. The overall reduction of COD and BOD₅ at the end of the fermentation period^a of salt deproteinized whey^b by *A. niger* strains.

Salt conc. (%)	<i>A. niger</i> CAIM 111		<i>A. niger</i> CAIM 167	
	COD-reduction	BOD ₅ -reduction	COD-reduction	BOD ₅ -reduction
0	75.6	73.7	71.1	67.9
2	77.8	76.3	75.6	75.0
4	75.6	75.0	77.8	73.7
6	75.6	75.5	75.6	73.7
8	75.6	75.5	76.7	74.2
10	77.3	75.5	76.7	74.7
12	75.6	76.3	77.8	76.3

^aCalculated after the 15th day of fermentation.

^bInitial lactose concentration: 41.0 g/L,
Initial pH: 3.5,
Initial methanol: 4%.

CONCLUSION

In conclusion, the chemical oxygen demand (COD) and biological oxygen demand (BOD₅) of salt whey can be markedly reduced up to 77.8 and 76.3%, respectively via bioconversion of whey into citric acid by *A. niger* CAIM 111 and CAIM 167 when the pH is adjusted to 3.5 and methanol is added at a level of 4%. Also, deproteinization of whey prior to fermentation is important to maximize the reduction of pollutant load of this by-product. This study showed that using salt whey, the by-product of the manufacture of Domiati cheese, as a substrate for the production of citric acid by *A. niger* CAIM 111 and *A. niger* CAIM 167 can be considered as a possible technique for utilizing whey for a beneficial purpose as well as a pollutant load reducer.

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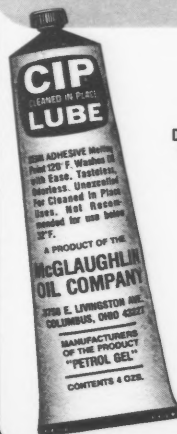
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Foodborne Illness (Part 1)

Staphylococcal ("Staph") Food Poisoning

George H. Reed, Services Manager,
University of Massachusetts/Amherst,
Environmental Health & Safety (EH&S),
Environmental Health Services,
N 414 Morrill Science,
Amherst, MA 01003

This type of foodborne illness is caused by ingestion of a food containing a toxin produced by *Staphylococcus aureus* bacteria. The organism is facultative (can grow under either aerobic or anaerobic conditions) but reproduces more profusely under aerobic conditions.

Some strains are very tolerant of salt and moderately tolerant of sugar. These bacteria can grow over a wide range of pH, 4.5 to 7, and a wide range of temperature, 44 to 122 F (6.5 to 50 C), but toxin production is best in the range of 70 to 98.7 F (21 to 37 C); they also survive freezing.

The toxin is an enterotoxin, that is it attacks the gastroenteric tract and can cause severe vomiting, nausea, abdominal cramps, and prostration, with some diarrhea possible. Symptoms can appear from 1/2 to 7 hours after ingestion of food containing the toxin, but average 2 to 4 hours; the duration of the illness is from 1 to 2 days. The toxin is heat-stable; normal heat processing of a food does not deactivate it.

The source is almost always a human, with the respiratory tract, especially the nose, harboring these bacteria; infected wounds and skin lesions can be involved. Foodhandlers who cough and sneeze on the job, who have careless hand habits, and who do not wash their hands frequently can transmit "staph" bacteria in the kitchen area. Foods frequently involved in "staph" poisoning:

- Protein foods, meats, poultry, eggs, dairy products, and seafood, are frequently involved; "staph" like protein food as a growth medium and these foods frequently have a high pH (low in acidity) and have a high water activity (a above 0.85), which contribute to the bacteria's growth.
- Foods that are handled extensively, as in slicing, deboning, grinding, shaping. This handling allows the bacteria an opportunity to contaminate food either directly from the foodhandler or indirectly from soiled food-contact surfaces, utensils and equipment, clothing, etc.
- Food that remains in the temperature "danger zone" (45 to 140 F; 7.2 to 60 C) longer than for normal preparation time allows bacterial growth to occur. This can happen

when food stands at room temperature after preparation, when left in the kitchen overnight, when it is allowed to cool slowly, and when it is held for service in equipment that cannot (does not) keep it hot or cold as necessary.

REMEMBER: Food items contaminated with "staph" usually look normal, with no abnormal smell and/or taste.

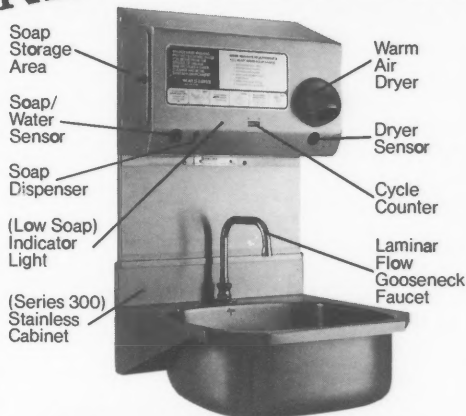
Principles of Control

1. Foodhandlers with acute respiratory illness, especially with frequent sneezing and coughing, or infected wounds, skin eruptions, and abrasions are a potential hazard for food contamination. Managers and supervisors need to check foodhandlers and prohibit those with these conditions from handling food.
2. Employees should practice personal cleanliness and have sanitary working habits. They should wash their hands frequently and effectively and control bad hand habits, especially the touching of body parts.
3. Handling of food shall be minimized; utensils rather than hands should be used. Plastic gloves can be used effectively to reduce direct handling; they become contaminated just like hands and shall be replaced as necessary.
4. Food-contact surfaces, equipment, and utensils need to be maintained in a sanitary condition.
5. Foods should not be held at lukewarm temperatures. Formation of toxin must be prevented by keeping foods either hot or cold. Once formed, toxin can not be deactivated by heating foods.
6. Leftover foods shall be cooled quickly, stored in shallow pans (small quantities), maintained below 45 F (7.2 C), and should be reheated only once, and then discarded. It is desirable that all leftovers be used within 24-36 hours (or frozen) or discarded.

Part two of the Foodborne Illness Series will be published in the December, 1993 issue of Dairy, Food and Environmental Sanitation.

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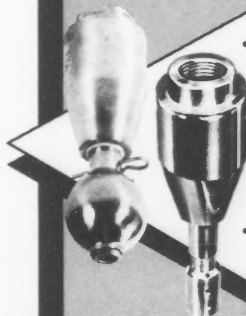
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From now until January 10, 1994, IAMFES will be accepting advertising orders for its 1994-95 Annual Membership Directory.

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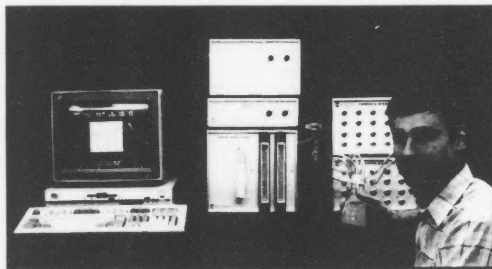
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Conference for Food Protection Plans Food Manager Certification Conference

The Conference for Food Protection is sponsoring a Food Manager Certification Conference-Workshop, December 14-16, 1993 in Chicago, Illinois. CFP's Food Protection Management Certification Committee is extending an invitation to the retail food industry, local, state and federal regulators, educators and trainers, national testing organizations and other interested individuals to learn more about the issues and assist in the development of a model program.

A good number of agencies and companies have already committed themselves to food manager certification and daily, the list grows longer. The complex mix of increasing technology, high industry turnover, a seemingly limitless number of foodborne pathogens and a litigious society sets the stage for manager training and certification.

The CFP Committee has been charged with developing a model national food manager certification program that promotes the reciprocal acceptance of manager certification and allows alternate means for managers to acquire, demonstrate and document that they possess this food safety knowledge.

Highlights of the Conference will include:

On the first day, expert speakers who will present pertinent information about various components of a food manager certification program.

- industry perspective of a food manager certification program
- traditional and alternate methods for managers to acquire, demonstrate and document that they possess food safety knowledge
- test development based on good psychometric practices and test administration in a secure manner
- third party evaluation of test development and certification program
- regulatory perspective of an existing food manager certification program
- FDA's perspective on use of the CFP Model Food Manager Certification Program

On the second day, four separate breakout sessions where facilitators and participants will be asked to address a specific component of a food manager certification program (draft document provided beforehand):

- Test development and administration
- Traditional and alternate methods of training
- Regulatory administration and certification
- Third party evaluation

Interim reports back to the Conference on the third and final afternoon by each work group.

A final copy of the CFP Food Protection Manage-

ment Certification Committee's Report will be mailed to each participant.

For more information, contact:

Shirley B. Bohm, Chair

Food Protection Management Certification Committee

Conference for Food Protection

Telephone: (217)785-2439

Fax: (217)524-0802

Leon Townsend

Executive Secretary

Conference for Food Protection

Telephone: (502)695-0253

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GIA, MATIC and SIEL in Paris, France to be grouped under one umbrella event: "IPA 94 - International Food Manufacturing Week"

For the first time, three major European trade exhibitions taking place in Paris, France — GIA (Machinery for the Food and Beverage Industry), MATIC (Equipment and Technology for the Meat Industry and Trade) and SIEL (Dairy Equipment) — will take on a new name to signify one umbrella event in 1994: "IPA 94, International Food Manufacturing Week" scheduled for October 24-28, 1994 in Paris, France.

In 1992, GIA, MATIC and SIEL were already held simultaneously and attendance results confirmed the need to develop a comprehensive showcase of equipment and processes for all food sectors under one roof. The combined event drew a more international, affluent and quality audience than the three shows had ever known ... of the 63,000 visitors, 25% were foreign, 48% were senior level decision-makers and 75% expressed the intention to make a purchase.

IPA 94 will fully develop the multi-sector approach by offering four main exhibit sectors: 1) IPA/SIEL to cover processing of dairy products, beverages and liquids, 2) IPA/GIA to cover solid food products equipment, 3) IPA/MATIC to cover machinery for the meat, poultry and fish industry and 4) IPA all-sectors for exhibitors of technologies suited for different food sectors.

IPA 94 will be scheduled the same week in Paris as SIAL 94, the International Food Products Exhibition, allowing visitors to see the entire food processing chain, from processing equipment to finished food products.

IPA 94 has been granted official Trade Fair Certification by the U.S. Department of Commerce which recognizes its high potential for U.S. exporters. Both the European Economic Community and France are world

leaders in terms of buying, supplying and trading agricultural and processed food products. French imports of food processing and packaging machinery, valued at \$1.5 billion in 1991, represent over 85% of total French consumption. The American Embassy in Paris rates food processing machinery as a best prospect for U.S. exporters.

The American Embassy in Paris will participate in the USA Pavilion at IPA 94 organized by IMEX Management, IPA representative in North America. The USA Pavilion is designed for U.S. exhibitors who want to benefit from the prominent booth location, publicity, logistic and marketing services as well as the ease of registration of the U.S. collective participation.

The U. S. food industry's main associations will all participate in IPA 94 including the American Meat Institute (AMI), the Dairy & Food Industry Supplies Association (DFISA) and the Food Processing Machinery & Supplies Association (FPM&SA).

IPA organizers expect the North American participation to take a healthy increase in 1994. In 1992, the combined GIA/MATIC/SIEL exhibitions welcomed 800 visitors from the U.S. and Canada, and 86 exhibitors from the U.S. who exhibited in the USA Pavilion, independently or through their European offices.

For further information, contact Julie Halas, IMEX Management at (301)460-9751.

Diversey Corporation Announces New Partnership

Diversey Corp. announced today it has formed a partnership with an exciting new company called Service 145 Corp. to develop and grow Diversey's North American institutional and national accounts businesses.

Owners of Service 145 Corp., which is named for the accumulated experience of its principals, include: Derrill Brown, Jack Ford, Robert Graham, Ronald Heagle, John Lachenmayer, and Gary Lockhart. The owners formerly were senior members of Ecolab's institutional division before leaving to create the new company.

Dr. Derek Cornthwaite, President and CEO of Diversey Corporation of Mississauga, Canada, commented, "This is great news for Diversey. We are committed to being the leading supplier of institutional sanitation, surface and water treatment products and services — including North America. We look forward to a long term partnership."

Diversey Corporation is part of The Molson Companies, Ltd. of Toronto, Canada and is a leading global supplier of cleaning and sanitation products, surface treatment and water treatment products and systems. In business for more than 70 years, Diversey Corporation has operations in more than 40 countries and services customers in 100 countries around the world.

For more information, please contact Lili Donaldson, Diversey Corp., 12025 Tech Center Drive, Livonia, MI 48150-2193, (313)458-2855.

Borden's Harold Steinke Receives NCI's Prestigious Laureate Award

Longtime cheese industry executive Harold Steinke was honored recently as the 1993 recipient of the National Cheese Institute's (NCI) annual Laureate Award. Steinke, whose distinguished career at Borden, Inc. stretched 42 years, was presented the award by outgoing NCI President David L. Rufenacht during the International Dairy Foods Association's (IDFA) 1993 Dairy Foods Industry Convention in Chicago, IL.

Established in 1989, the NCI Laureate Award was created to honor an individual who has made a major contribution to the growth and development of the cheese industry over a period of many years.

"Harold has always had the cheese industry at heart," said Rufenacht, quoting former NCI Executive Director Bob Anderson.

Steinke Has Played Comprehensive Role in Leading Industry

During his tenure at Borden, Inc., Steinke served as Quality Control Director; Director of Research; Production Manager; Vice President, Cheese Division; President, Refrigerated Products; Vice President, Economic and Industrial Relations; and Vice President, Purchasing and Industrial Affairs. After his retirement in 1988, he remains a consultant to the company.

Steinke has represented the cheese industry in numerous capacities, both in the United States and abroad.

- He chaired the dairy group as a representative of the U.S. in the European Community Conference of Agriculture.
- He was an active member of the board of directors of the New York State Cheese Manufacturers Association for 16 years.
- He was president of the Cheese Importers Association and has served on its board of directors for over 20 years.
- He was elected to the board of directors of the National Cheese Exchange in 1985 and serves through this year.
- He has helped to lead the National Cheese Institute: as a board member from 1970-1987; chairman of the research committee; and NCI President from 1978-1980.

This year's Laureate Award presentation was made during the gala Four-in-One Banquet at the Palmer House Hilton, Chicago, IL. The event took place during the annual meetings of the Milk Industry Foundation (MIF), National Cheese Institute (NCI), International Ice Cream Association (IICA) and American Butter Institute (ABI).

For more information contact Jane Morris at (202)296-4250.

Food and Environmental Hazards to Health

Unintentional Carbon Monoxide Poisoning Following a Winter Storm—Washington, January 1993

Carbon monoxide (CO) poisoning was a major health consequence of a severe storm that struck the Puget Sound region of western Washington state the morning of January 20, 1993. Wind gusts up to 94 miles per hour interrupted electrical power for an estimated 776,000 residents, and during the 4 nights following the storm, temperatures fell to near freezing. Because of the use of alternative sources of energy for indoor cooking and home heating, the risk of exposure to CO increased for many persons. This report summarizes cases of storm-related CO poisoning among persons who were initially evaluated at Seattle's Harborview Medical Center (HMC) or who were referred to the Virginia Mason Medical Center (VMMC) for hyperbaric oxygen therapy.

All patient data were extracted from medical records. A case of CO poisoning was defined as an arterial carboxyhemoglobin (HbCO) level of >2% (for nonsmokers) or >9% (for smokers) in a person who sought medical care during January 20-25 and had not been involved in a fire or intentional CO exposure.

The 44 patients who met the case definition and were evaluated or treated at HMC or VMMC represented 17 separate incidents of CO exposure (median: two patients per incident; range: one-nine patients). Eight hospitals referred 35 of the patients to VMMC for hyperbaric oxygen therapy; these 35 included five of 14 patients initially evaluated at HMC. Nine (20%) patients had lost consciousness. The median arterial HbCO level on initial evaluation was 17% (range: 5%-46%).

The median age of patients was 29 years (range: 2-87 years); 26 (59%) were female. Eighteen (41%) patients were Asian, 14 (32%) were non-Hispanic white, nine (20%) were Hispanic, two (5%) were of Middle Eastern ancestry and unknown ethnicity, and one (2%) was black. Fifty percent of the patients did not speak English, including 11 (61%) who were Asian and all nine who were Hispanic.

Within 9 hours of the onset of the storm, case-patients began seeking care in emergency rooms; 38 (86%) patients sought care between 6 p.m. and 6 a.m. on one of the three nights following the storm. The source of CO was burning charcoal briquettes in 11 (65%) incidents (all involving racial/ethnic minorities), gasoline powered generators in four (24%), a generator and a propane-powered space heater in one, and an automobile in one.

During the night of January 21, radio stations first broadcast reports of CO poisoning and the danger of using charcoal briquettes, gasoline-powered generators, and propane-powered heaters in poorly ventilated areas; newspaper and television reports appeared during January 22-23. On January 22, the fire department distributed more than 2,000 written warnings door-to-door. All reports and warnings were in English only.

Editorial Note: The findings in this report differ from previous descriptions of CO poisoning following winter storms in the northern United States because of the large number of cases involved, especially among non-English-speaking persons. Because VMMC is the only hyperbaric referral facility in the region, and the indications for hyperbaric therapy (e.g., arterial HbCO level >25%, any neurologic impairment regardless of HbCO level on initial evaluation, or ischemic changes on electrocardiogram) have been publicized among emergency physicians in the area, the 35 patients referred for hyperbaric oxygen therapy probably represent most of the cases of severe poisoning resulting from this storm. Efforts to identify additional, less severe cases are in progress.

In Washington, burning charcoal briquettes were a common source of CO, especially for persons who were members of racial/ethnic minorities. Nonstorm-related CO poisoning resulting from indoor cooking with charcoal briquettes has been reported as a problem in Korea and for non-English-speaking residents of the United States. A previous health advisory about the danger of CO poisoning was targeted at Asian immigrants because of their traditional use of briquettes for cooking. The impact of media reports and other warnings to prevent CO poisoning following the storm in Washington cannot be determined. On January 23—when most reports had been publicized—more than 160,000 persons remained without electrical power, but no cases occurred after 4 a.m. that day. However, the non-English-speaking members of the population would probably not have understood these warnings, even if they had had the electrical power to receive them. The relation of culture and language to the risk of CO poisoning following this storm is under investigation. However, when such storms occur, public health and safety agencies and other organizations should attempt to provide public health warnings that are prepared in both English and the languages of groups that might be at increased risk because of cultural or linguistic factors.

Morbidity and Mortality Weekly Report 2/19/93

Toddler Deaths Resulting from Ingestion of Iron Supplements — Los Angeles, 1992-1993

During June 1992-January 1993, five children aged 11-18 months in the Los Angeles area died after ingesting iron supplement tablets. The first death was reported by the Consumer Product Safety Commission (CPSC) to the Los Angeles County Department of Health Services (LADHS) in November 1992 and then reviewed by the Los Angeles County Child Death Review Committee. On January 6, the Los Angeles County coroner's office reported three additional deaths associated with ingestion of iron to the Child Death Review Committee and the health department. A fifth

death resulting from iron poisoning was reported January 29. This report summarizes preliminary information from an investigation of these cases.

Case 1. A 16-month-old boy died in June 1992 after ingesting 30-35 prenatal iron tablets that had been in a loosely capped container on a table. Prenatal 325 mg ferrous sulfate tablets, with an elemental iron content of 60 mg per tablet, were identified as the toxic agent. Medical treatment was delayed because clinical manifestations were not present initially.

Case 2. An 18-month-old boy died in September 1992 after consuming an estimated 30-40 prenatal iron tablets. Prenatal 325 mg ferrous sulfate tablets, with an elemental iron content of 60 mg per tablet, were identified as the toxic agent. The tablets were in an uncapped bottle on a table.

Case 3. A 12-month-old boy died in November 1992 after consuming an estimated 300 iron tablets. No container was available for confirmation of the strength of the dosage.

Case 4. An 11-month-old girl died in December 1992. A 2-year-old sibling had fed the younger child 30-35 prenatal iron tablets. Prenatal 325 mg ferrous sulfate tablets, with an elemental iron content of 60 mg per tablet, were identified as the toxic agent. The iron tablets were in a box on the floor.

Case 5. A 13-month-old girl died in January 1993 after consuming an unknown number of prenatal iron tablets prescribed for an older sister. Prenatal 325 mg ferrous sulfate tablets, with an elemental iron content of 60 mg per tablet, were identified as the toxic agent. The tablets were spilled on the floor for an unspecified period of time before the child was observed to have them in her mouth.

The prenatal iron supplements ingested in these five cases were red or green diskshaped tablets with a glossy sugar coating; they are commonly used as an iron supplement for prenatal patients. All of the recovered containers had child-resistant safety caps and a warning that specified the need to keep all medications away from children.

On January 20, the LADHS issued a warning through the local media to parents and medical practitioners regarding the potential dangers of iron overdose.

Editorial Note: Iron is the most common cause of pediatric poisoning deaths reported to poison control centers in the United States. During 1991, 5144 ingestions of iron supplements were reported to poison control centers in the United States; 11 were fatal. Children aged <6 years accounted for 3578 (69.6%) ingestions of iron and nine of the deaths. In addition, 18,457 ingestions of iron in the form of multivitamin or combination preparations were reported; 16,021 (87%) occurred among children aged <6 years. During 1991, consumption of multivitamin preparations in the form of prenatal vitamins with iron caused two additional deaths among children aged 17 and 18 months.

Although a toxic dose of elemental iron is 30 mg/kg, and a fatal dose is typically more than 250 mg/kg, ingestion

of doses as low as 60 mg/kg have resulted in death. More than 120 different iron-containing preparations are available by prescription and over-the-counter purchase. The children in this report each consumed approximately 30 tablets of iron supplements; the number of tablets associated with a toxic dose varies, depending on the form and amount of iron used. Although in three cases the iron supplement was a prescription item, the 60 mg per tablet dosage is also available in over-the-counter preparations. Ingestion of as few as five or six tablets of a high-potency preparation could be fatal for a 10-kg (22-lb) child.

Iron poisoning is characterized by four clinical stages. The first stage—with a duration of up to 6 hours after ingestion—is characterized by acute onset of gastrointestinal symptoms (i.e., vomiting and diarrhea) that may progress to shock, coma, seizures, and death. During stage two—from 6 to 24 hours after ingestion—patients may be asymptomatic; however, evaluation and treatment for iron poisoning should not be delayed. During stage three—from 12 to 48 hours after ingestion—there may be hepatic and renal failure and cardiovascular collapse. Stage four—from 3 to 4 weeks after ingestion—may include gastrointestinal obstruction and hepatic cirrhosis.

From 1982 through 1992, three children died from iron toxicity in Los Angeles County: one each in 1986, 1988, and 1990. Thus, the five deaths in 7 months reported here represent a substantial increase in iron-related deaths. Measures to prevent toxic ingestions (e.g., child-resistant packages and warning labels) were present in at least four cases described in this report. However, iron supplements may be sold over the counter, and public perception of the potential danger of a vitamin or mineral supplement product may be low. County and state health officials are investigating the morbidity and mortality associated with these supplements; CPSC is also assisting the LADHS in the investigation of this problem.

The following measures may help prevent iron toxicity-associated deaths: 1) iron supplements should be prescribed in limited amounts and dosages and when medically indicated; 2) health-care providers and others who prescribe or dispense iron supplements should emphasize to parents the hazards of unintentional iron consumption by children; and 3) adults should be instructed in the proper use of child-resistant packages when they receive them. Other considerations include the need to re-evaluate the effectiveness of child-resistant packaging and warning labels; for example, because ingestion of a small number of iron tablets may cause toxicity, tablets packaged in child-resistant individual blister packs may limit the number of tablets a child can access. Iron tablets should be made less appealing to children by eliminating use of sugar coating or attractive colors. Finally, educational efforts should be aimed at persons who use iron supplements and who have young children at home.

MMWR 2/19/93

HAZCON-Based Total Quality Management

Retail Food Operation Food Hazard Control Checklist

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 Hospitality Institute of Technology and Management,
 830 Transfer Road, Suite 35,
 St. Paul, MN 55114

The following is the first installment of the Retail Food Operation Food Hazard Control Checklist mentioned in the October 1993 column. This checklist will be continued over the next several months to cover its entirety.

RETAIL FOOD OPERATION FOOD HAZARD CONTROL CHECKLIST [40°F - 150°F (4.4°C - 65.6°C)]¹

FOOD SAFETY CONTROL REQUIREMENTS	PERFORMANCE EVALUATION	NEEDED TO ASSURE SAFETY
MANAGEMENT		
SENIOR MANAGEMENT COMMITMENT AND INVOLVEMENT FOR FOOD SAFETY		
<p>Management: (Haz)</p> <ul style="list-style-type: none"> Has prepared a food safety commitment statement. (SEE FOOD SAFETY POLICY.) Demonstrates commitment through food safety promotion actions (e.g., safety committees, incentives, awards, etc.) (SEE QUALITY MANAGEMENT TEAM.) Provides an example of professionalism and high quality standards for employees by scrupulously following all food safety policies, procedures and standards. For example: use hair restraints, proper hand sanitation methods, and good personal hygiene habits at all times. Sets challenging, measurable, and attainable safety improvement goals; set the safety example in all activities; interview employees during walk-around to hear and respond to their suggestions for process improvement. (SEE WEEKLY ACTION SCHEDULE AND YEARLY ACTION SCHEDULE.) Establishes accountability measurers for meeting food safety responsibilities. (SEE FOOD SAFETY-ASSURED POLICIES, PROCEDURES, AND STANDARDS FOR ALL PERSONNEL.) 		
<p>Organization chart (Haz)</p> <p>Manager(s) prepare and maintain an organization chart which identifies each employee's name and job responsibilities. (SEE ORGANIZATION FOR ASSURED FOOD SAFETY.) It is used to ensure that each employee knows who is his/her supervisor and who is responsible for making him/her capable of zero defects and exactly what they are expected to do. It is also used to:</p> <ul style="list-style-type: none"> Prevent the occurrence of job performance non-conformity with standards. Identify and record any product safety problems. Initiate, recommend, or provide solutions to problems. Control future organization action to prevent recurrence. 		
<p>Food Safety Program Managers (FSPMs) (Haz)</p> <p>There are at least two management level personnel trained in the prevention of foodborne illness and injury at all times.</p> <ul style="list-style-type: none"> A food safety program manager is available on all work shifts to answer technical questions and provide coaching as needed for employee improved performance. If one of these trained individuals leaves, a trained replacement is hired within one month, or an employee is trained to assume the food safety management position, so that he/she is proficient in HACCP-based food safety within one month. FSPMs continue to update their knowledge monthly. Under the direction of the owner/manager FSPMs write, implement, and improve the food safety action plan with zero-defect-based food safety procedures and standards that clearly describes how food safety assurance (pre-control), safety control, and safety improvement goals will be met. 		
<p>Allocation of resources (Haz)</p> <ul style="list-style-type: none"> Sufficient funds are allocated to ensure employees are adequately trained and capable of foodborne illness prevention. A system is used to measure the cost saving from doing the job tasks correctly the first time. 		

Abbreviations: (Haz) = Hazard; (Reg) = Regulatory; (Qual) = Quality; (OSHA) = Occupational Safety and Health Agency

¹Temperatures, unless otherwise stated, are food temperatures. They are measured both 1/16-inch below the surface as well as at the center of food in order to determine the degree of control and stability of hot and cold systems.

FOOD SAFETY CONTROL REQUIREMENTS	PERFORMANCE EVALUATION	NEEDED TO ASSURE SAFETY
Smoking areas (Reg) <ul style="list-style-type: none"> • A sign is posted in the entry ways stating that SMOKING IS PROHIBITED EXCEPT IN DESIGNATED AREAS. • Customers are asked for their smoking preference and assign seats accordingly. • SMOKING PERMITTED and NO SMOKING signs are posted in the designated areas. 		
License (Reg) <ul style="list-style-type: none"> • The establishment license is posted. 		
Ethical truth in menu practices (Reg) <ul style="list-style-type: none"> • Menus contain no incorrect or deceptive, merchandising terms relating to the method of preparation, characteristics, or geographic points of origin of a food product that cannot be verified by the supplier. • Products that have been frozen, canned, or preserved to extend shelf-life are not labeled as "fresh". • The representation of weight, price, brand, number, quality, standard, or grade of products on menus is accurate and consistent with the menu or advertised claims. • Customers are notified whenever food is substituted. 		
HAZARD ANALYSIS AND CONTROL		
Management: (Haz) <ul style="list-style-type: none"> • Maintains a system input-process-output process diagram that identifies all of the products, services and other components of this operation. (SEE INPUT-PROCESS-OUTPUT DESCRIPTION.) • Specifies the immune status of the consumer, as well as likely product abuse by the customer. (SEE INPUT-PROCESS-OUTPUT DESCRIPTION.) • Maintains an awareness of the new cases of foodborne illness reported in the literature so they can have a better understanding of hazards, likely process failures, and best controls. • Continually analyzes the operations process to find food hazards through food safety audits, environmental monitoring, and self inspections to identify jobs and processes that have hazards which could lead to foodborne illness. There are four degrees of hazard certainty: <ul style="list-style-type: none"> HAZARD: has been continually identified by food safety experts from foodborne illness investigations as agents and causes responsible for foodborne illness outbreaks. LIKELY HAZARD: has been shown by food safety experts in reproducible laboratory studies to be likely hazards and causes of foodborne illness outbreaks, or has a strong theoretical rationale based on scientific data. PROPOSED HAZARD: has been proposed in refereed professional journals by some investigators as a hazard or cause of foodborne illness. NOT A HAZARD: has never been identified as a cause of any known foodborne illness cases and has no laboratory-demonstrated basis or strong theoretical rationale for being a potential hazard or cause of foodborne illness. • The following criteria are applied to identification of a food hazard. <ol style="list-style-type: none"> 1. The evidence of hazards to health. 2. The microbiological, toxin, chemical, and hard foreign object status of the material being used. 3. The likelihood of illness and consequence to the consumer of the ultimate hazard in the food or beverage. 4. The effect of processing on the level of hazard contamination, recontamination, or multiplication during subsequent handling, storage, service, and use of leftovers. 5. The knowledge and sensitivity of the consumer at risk and likelihood of food abuse. 6. The cost/benefit ratio associated with the application of hazard control criteria. 7. Capability of the management to exercise pre-control and operational control. • Management examines each process hazard and is able to describe the following: <ol style="list-style-type: none"> 1. Sequence of process steps identifying ingredients, time, temperature, and equipment essential to hazard control. 2. How hazards can lead to illness. 3. Pre-control and operational control procedures and standards that are used in the following areas to eliminate the hazards. <ul style="list-style-type: none"> - Management controls. - Environmental controls. - Facility controls. - Equipment controls. - Personnel controls. - Supply controls. - Product and service controls. - Consumer controls. 		
WRITTEN PROGRAM		
Management: (Haz) <ul style="list-style-type: none"> • Maintains safety-assured policies, procedures, and standards. Uses results of hazard analysis to write and keep up-to-date safety-assured policies, procedures and standards that describe how each employee will do his/her tasks so that safety is assured. All policies, procedures, and standards are evaluated before implementation to assure that they are capable of zero defects. • Has a written food hazard control checklist that is used to train, coach, and check the performance of employees and the processes. (SEE RETAIL FOOD OPERATION FOOD HAZARD CONTROL CHECKLIST.) 		

FOOD SAFETY CONTROL REQUIREMENTS	PERFORMANCE EVALUATION	NEEDED TO ASSURE SAFETY
<ul style="list-style-type: none"> • Conducts regular workplace prevention inspection of facilities and equipment (e.g., refrigeration, cooking, and hot holding devices pot and dish washing and sanitizing, insect and rodent control). The Food Hazard Control Checklist is used to collect performance information and identify improvement opportunities. • Uses the Food Hazard Control Checklist as the input to the Weekly and Yearly Action Schedules in order to correct problems and to prevent similar problems. For example: <ol style="list-style-type: none"> 1. Modification of equipment or renovation of environmental facilities. 2. Modification of customer service procedures. 3. Modification of work methods. 4. Modification of supplier standards modified or changing suppliers. 5. Employee retraining or special needs accommodated. New employees training. • Posts an up-to-date cleaning and sanitation schedule for all areas and equipment with specified employee assignments. The written schedule with specific assignments is available to all employees. (SEE MAINTENANCE SCHEDULE AND INSTRUCTIONS and CLEANING AND SANITIZING SCHEDULE AND INSTRUCTIONS.) • Uses an appropriate pest control program to assure the control of rodents, insects, and birds. (SEE PEST CONTROL SCHEDULE AND INSTRUCTIONS.) • Provides a list of the ingredients in foods sold to customers so that employees can correctly answer customer questions concerning ingredients used to prepare menu items. Ingredient substitution is also disclosed. 		
<p style="text-align: center;">MANAGER COMMUNICATION AND EMPLOYEE TRAINING</p> <p>Management: (Haz)</p> <ul style="list-style-type: none"> • Evaluates personnel training needs to determine specialized training and retraining. Asks supervisors and employees for feedback as to how to improve training. • Trains supervisors in pertinent food safety matters, food safety leadership, coaching, and employee empowerment to take action at any time to prevent a problem. • Communicates the food safety program to all employees in monthly training sessions of at least 30 minutes. • Provides training prior to all new job assignments, including training on specific hazard controls and in self-inspection, testing and monitoring of the processes which they are doing to accomplish food safety goals. • Maintains records of training: date, topic, content, attendance. (SEE NEW EMPLOYEE TRAINING RECORD and CONTINUING EDUCATION TRAINING RECORD). • Updates training at least annually, or as work processes and ingredients change. 		
<p>Training meetings use a variety of educational approaches which include: handouts, demonstrations of proper procedures, lectures using slides or overheads, showing filmstrips, and having guest speakers.</p>		
<p>Testing. Employees are tested on the material and coached in the use of proper procedures for safe food handling.</p>		
<p>Employee performance certification. Before any employee is given a new task to do, FSPMs train all employees to know the hazards as well as hazard control procedures and standards for the jobs he/she is assigned to perform. When employees have demonstrated a zero defect capability, he/she receives performance certification from the FSPMs.</p>		
<p style="text-align: center;">PROCESS CONTROL PROBLEM INVESTIGATION AND CORRECTIVE ACTION</p> <p>Management: (Haz)</p> <ul style="list-style-type: none"> • Maintains procedures for process problem reporting, problem investigation, corrective action, and follow-up. • Evaluates what works and what does not work so that the prevention process can be continually improved. • Allows for employee input in bringing hazardous food operating conditions to the manager's attention. • Allows employees to make suggestions for improvement of production methods. (SEE QUALITY ASSURANCE HAZARD-PROBLEM ACTION LOG.) 		
<p>Coaching and skill development (Qual) FSPMs and supervisors:</p> <ul style="list-style-type: none"> • Continually observe activities and food handling procedures at every station. • Explain reasons for doing specific tasks. • Unsafe practices and procedures are not allowed to continue. • Correct employee task performance is rewarded. • Positive reinforcement is given to employees whenever possible. 		
<p>Quality Management Team (QMT) (Qual) Employees are:</p> <ul style="list-style-type: none"> • Involved as an integral part of the quality management program. • Asked to review problems and to suggest more effective operating policies and procedures. • Continually encouraged to identify food safety hazards and make suggestions for improving the program. (SEE QUALITY MANAGEMENT TEAM; PROBLEM-OPPORTUNITY IDENTIFICATION WORKSHEET; CAUSE-EFFECT ANALYSIS AND DIAGRAM; PROBLEM OPPORTUNITY ACTION PLAN AND PROGRAM; GROUP ACTION LOG; INDIVIDUAL ACTION LOG.) 		

This Retail Food Operation Food Hazard Control Checklist will continue in subsequent issues of Dairy, Food and Environmental Sanitation. The December installment will cover: Handling Emergencies; Program Enforcement, Recognition and Renewal; Personnel; Environment; and Facilities.

Federal Register

Department of Agriculture

Food Safety and Inspection Service

Centralization and Automation of the Export Certification Process

Agency: Food Safety and Inspection Service, USDA.

Action: Proposed rule.

Summary: The Food Safety and Inspection Service (FSIS) is proposing to amend the Federal meat and poultry products inspection regulations governing the certification of domestic meat and poultry products intended for export to foreign countries. FSIS is proposing to centralize and automate the export certification process, to replace the official export stamp with an unofficial stamp under the control of each official establishment intending to export product, and to rescind the requirement that each individual container of product be stamped with the number of the export certificate that covers the product. FSIS is also proposing to establish a performance-based compliance review program for those establishments exporting product, to establish penalties for failure to comply with these proposed regulations, and to establish a standard fee for preparation of export certificates which reflect the performance of inspection procedures beyond routine United States inspection procedures. The proposed rule would also make the exporter responsible for knowing the requirements of the country to which product is being exported and for ensuring that any additional requirements above and beyond United States requirements have been met. FSIS is proposing to revise the definition of "inspector" is both the Federal meat inspection and poultry products inspection regulations to include an inspector of the Program or any individual designated by the Administrator, FSIS. FSIS is also proposing to amend the Federal meat and poultry products inspection regulations to add a definition of "responsibly connected person." FSIS would continue to conduct all inspection activities necessary to assure the production of sound, wholesome, unadulterated and properly labeled products that meet the requirements of the United States. The proposed changes are designed to improve compliance with foreign country facility, equipment, animal health and procedural requirements, improve the accuracy and security of export certificates, provide ready access and uniform interpretation of foreign country requirements, expedite transmission of documents and focus compliance resources on areas most in need of attention.

Dates: Comments must be received on or before: December 17, 1993.

Addresses: Written comments to: Policy Office, Attn: Linda Carey, FSIS Hearing Clerk, room 3171, South Agriculture Building, Food Safety and Inspection Service, U.S. Department of Agriculture, Washington, DC 20250. Oral comments, as provided by the Poultry Products Inspection Act, should be directed to Dr. Robert Fetzner, (202)720-9051.

For Further Information Contact: Dr. Robert Fetzner, Director, Export Coordination Division, International Programs, Food Safety and Inspection Service, U.S. Department of Agriculture, Washington, DC 20250, (202)720-9051.

Federal Register/Vol. 58, No. 200/Tuesday, October 19, 1993/Proposed Rules

Food and Drug Administration

Food Techniques, Inc.; Withdrawal of Food Additive Petition

Agency: Food and Drug Administration, HHS.

Action: Notice.

Summary: The Food and Drug Administration (FDA) is announcing the withdrawal, without prejudice to a future filing, of a food additive petition (FAP OA 4207) proposing that the food additive regulations be amended to provide for the safe use of ozone as an antimicrobial agent in poultry meat during processing.

For Further Information Contact: Gerald J. Buonopane, Center for Food Safety and Applied Nutrition (HFS-217), Food and Drug Administration, 200 C St. SW, Washington, DC 20204, 202-254-9519.

Supplementary Information: In a notice published in the Federal Register of June 25, 1990 (55 FR 25887), FDA announced that a food additive petition (FAP OA4207) had been filed by Food Techniques, Inc., 267 Hayes Mill Road, Atco, NJ 08004. The petition proposed that the food additive regulations be amended to provide for the safe use of ozone as an antimicrobial agent in poultry meat during processing. Food Techniques, Inc., has now withdrawn the petition without prejudice to a future filing (21 CFR 171.7).

Dated: October 5, 1993.

Fred R. Shank,

Director, Center for Food Safety and Applied Nutrition.

Federal Register/Vol. 58, No. 196/Wednesday, October 13, 1993/Notices

80th IAMFES Annual Meeting Highlights

The 80th Annual Meeting of the International Association of Milk, Food and Environmental Sanitarians was held August 1-3, 1993 in Atlanta, Georgia. The theme of this year's meeting was "The Challenge: Application of Science for Consumers, Academia, Industry and Regulatory."

Co-hosting the meeting was the Georgia Association of Food and Environmental Sanitarians (GAFES). Under the direction of Local Arrangements Co-Chairs Joe Frank and Bob Brackett, GAFES helped plan and conduct an efficient, educational and enjoyable Annual Meeting. Mr. Frank and Mr. Brackett, as well as the numerous local volunteers and donors, are to be commended for their hard work. Their efforts made for an outstanding and memorable event.

IAMFES was honored to have the International Life Sciences Institute participate in this year's Annual Meeting. The Institute's sponsorship of a symposium on Foodborne Microbial Pathogens greatly enhanced the educational program. Comprised of six sessions, this symposium featured over 30 internationally renowned food safety experts.

The 80th Annual Meeting's program was the Association's most ambitious to date. Over 150 food safety professionals gave 175 presentations during the three day meeting. These, combined with two pre-meeting workshops, 20 professional development group and committee meetings, and over 60 technical supplier displays, provided meeting attendees a wealth of information. The following is a brief look at the 1993 Annual Meeting Program.

Pre-Meeting Workshops

To accompany the outstanding scientific presentations on food and dairy microbiology, IAMFES sponsored two pre-meeting workshops. Both day and a half workshops were filled to capacity.

Participants in the Quality Assurance in Microbiology Workshop, conducted by Michael H. Brodsky of the Ontario Ministry of Health, were presented a working definition for laboratory quality assurance, shown how to identify potential sources of error in methods and materials, and taught effective audit procedures. They also had the opportunity to share their experiences with colleagues and develop their own QA programs.

Drs. Daniel Y.C. Fung of Kansas State University and Jim Dickson of Iowa State University conducted the Rapid Microbiological Methods Workshop aimed at microbiologists, food scientists and laboratory personnel. Participants received an overview of and gained hands-on experience with a number of rapid methods. Among the methods and equipment featured were: ELISA kits, Vitek, Bactometer, BioMérieux, MicroID, BioControl, GeneTrak, Petrifilm, Redigel, Isogrid, Spiral Biotech and VICAM.

Annual Meeting Social Events

The Local Arrangements Committee put together a fine array of spouse tours highlighting the attractions and ambiance of the Atlanta area.

Stone Mountain — Over 350 people were able to view the images of Jefferson Davis, Robert E. Lee, and Stonewall Jackson on the world's largest granite monolith, see an impressive laser light

show and tour a completely restored antebellum plantation.

Annual Awards Banquet — Over 350 people attended the Annual Awards Banquet to enjoy a fine meal and recognize the accomplishments of the award winners. A write-up of the Annual Awards and their winners begins on page 674.

Annual Meeting Program: A Review

Meetings of Task Forces, Committees and Professional Development Groups

On Sunday, August 1st, meetings were held by two IAMFES task forces, six committees and 12 professional development groups. Holding their first meetings were new professional development groups for Poultry Safety and Quality; Seafood Safety and Quality; Meat Safety and Quality; and Food Safety Networks. Annual reports from these groups begin on page 662.

Opening Session / Ivan Parkin Lecture

The opening session of the 80th IAMFES Annual Meeting was presided over by President Dr. Michael Doyle. The keynote speaker, presenting the Ivan Parkin Memorial Lecture, was introduced by President-Elect Harold Bengsch.

Dr. Morris Potter, Assistant Director for Bacterial and Mycotic Diseases at the Centers for Disease Control, National Center for Infectious Disease in Atlanta, presented the Ivan Parkin Lecture entitled "The Challenges of epidemiology in Food Protection."

Dr. Potter received a \$1000 honorarium and commemorative plaque honoring his presentation of the Ivan Parkin Lecture. The Lectureship is sponsored by the IAMFES Foundation Fund through contributions of IAMFES Sustaining Members.

A wine and cheese reception in the Exhibit Area followed the Opening Session. Attendees were able to view displays of technical equipment, products and services while renewing acquaintances and contacts. A complete review of the 1993 IAMFES Annual Meeting Exhibitors can be found on pages 680-684.

Scientific Program

The three day educational program consisted of five technical sessions of submitted presentations, 16 symposia of invited presentations, a general session and a scientific poster session.

Technical Sessions

There were five technical sessions at this year's Annual Meeting. Consisting of more than 35 submitted presentations, these sessions covered:

Analytical Methods, convened by R. Nickelson, Silliker Laboratories of Texas, Inc. and N. Stern, USDA;

General Food Microbiology, convened by J. Cerveny, Oscar

Mayer Foods Corp. and K. Glass, Food Research Institute, University of Wisconsin;

Antimicrobials, convened by J. Scott, National Food Processors Assn. and H. Gourama, Penn State University;

Dairy, convened by D. Marshall, Louisiana State University and R. Schmidt, University of Florida; and

Risk Assessment and Education, convened by R. Carawan, REC and Associates and E. Berry, North Carolina State University.

Symposia

The bulk of the presentations at the 1993 Annual Meeting were found in the scientific symposia. Nearly 100 symposia presentations were given during the course of the three day meeting. Speakers from Australia, Belgium, Canada, France, Germany, Korea, Switzerland, the United Kingdom, the United States and Venezuela presented the latest research in food microbiology, international perspectives on foodborne pathogens, biotechnology and the food safety concerns of industry and regulatory agencies. These symposia brought together many of the most internationally recognized authorities on food safety.

International Life Sciences Institute sponsored Symposium on Foodborne Microbial Pathogens

Six of these symposia made up the larger Symposium on Foodborne Microbial Pathogens, sponsored by the International Life Sciences Institute, ILSI North America Technical Committee on Food Microbiology and ILSI Europe Scientific Committee on Microbiology.

The first session, **Listeria monocytogenes: Current Issues and Concerns**, convened by G. Evancho, Campbell Soup Co., addressed the scientific issues from the perspective of U.S. food industry and government and the international scientific community. Among the areas covered were the state of the science, zero tolerance and minimum infective dose, industry and regulatory control programs and the status of current monitoring efforts.

Campylobacter Update, convened by L. Post, M&M/Mars, had speakers who discussed the clinical and epidemiological aspects of *Campylobacter jejuni* and the U.S. and European perspectives on the bacteria as a foodborne pathogen.

The recent illness outbreak in the Western United States was the hot topic of the **International Perspectives on Escherichia coli O157:H7** session. Convened by P. Hall, Kraft General Foods, this session contained presentations from members of the U.S. Dept. of Agriculture, U.S. Food and Drug Administration, the Canadian Laboratory Centre for Disease Control, and the British Public Health Laboratory Service.

The fourth session dealt with a variety of international food safety issues. The presenters discussed microbial concerns from the European perspective, that of North and South American countries and the Pacific Rim countries. The **International Concerns of the International Community** symposium, convened by A. Baird-Parker, Unilever Research, addressed the role of HACCP and ISO 9000 in achieving scientific consensus as a method of resolving free trade issues of a microbial nature.

ILSI-Sponsored Research Update included the research findings of studies funded by the ILSI North America Technical Committee on Food Microbiology. Convened by D. Zink, Nestlé USA, Inc., *E. coli* and *Listeria monocytogenes* were the main research topics.

The final session, convened by R. Anderson, West Virginia University, was **Late Breaking Reports: Hazards of Protozoa in Food and Water — The Case of Cryptosporidium**. It focused attention on the Milwaukee outbreak and other foodborne and waterborne protozoa of public health significance.

More Symposia

The remaining symposia covered a variety of food safety issues of importance to IAMFES members. These included:

Water Reuse in Animal Processing Plants, convened by R. Carawan and K. Rajkowski, USDA;

Fumonisins, convened by L. Bullerman, University of Nebraska and A. Draughon, University of Tennessee;

New Horizons in Dairy Food Safety and Quality, convened by T. Klaenhammer, North Carolina State University and C. White, Mississippi State University;

Baking Equipment Standards and General Sanitation in Baking Operations, convened by M. Ronge, Martin Ronge and Associates;

Control of Bacteria and Public Health Significance in Foods of Animal Origin, convened by I. Wesley, USDA and J. Dickson;

Viral Foodborne Diseases, convened by J. Guzewich, New York State Dept. of Health, and K. Mountjoy, Health and Welfare Canada; **FDA Computer Data Base and Reporting Systems**, convened by J. Smucker, FDA;

Economics of Foodborne Disease, convened by E. Todd, Health and Welfare Canada and T. Roberts, USDA; and

Food Safety Research Networks, convened by R. Clarke, Agriculture Canada.

Poster Session

A technical poster session, convened by B. Langlois, University of Kentucky, provided over 40 presenters the opportunity to display their research findings. A period of time was set aside for the authors to be in attendance to answer questions.

Video Theatre

Selections from the IAMFES Audio-Visual Lending Library were presented over the course of the meeting in a Video Theatre. Over twenty-five video tapes were presented during the two and a half days the theatre was open.

General Session

On Tuesday afternoon, August 3rd, the General Session, **Communicating Food Safety in the News**, was held. This was the lone session scheduled during this time to encourage all meeting goers to attend. The increasing importance of food safety communication and the news media was analyzed and discussed. Representatives from television and print media, industry and education were on hand to discuss the issues involved with food safety news stories.

Annual Business Meeting

Following the General Session, IAMFES held its Annual Business Meeting. During this session, three resolutions were passed, thanking the Georgia Association of Food and Environmental Sanitarians, the Stouffer Waverly Hotel and the International Life Sciences Institute for their contributions to the great success of the 80th Annual Meeting. More details of the Annual Business Meeting can be found on page 660.

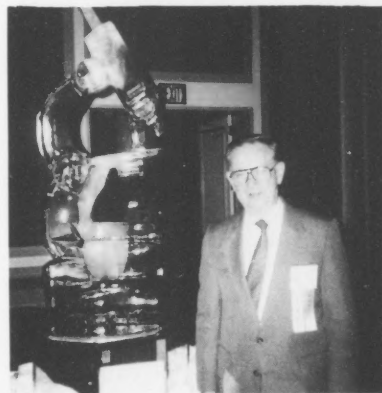
80th Annual Meeting Photos

*An Educational and Enjoyable Time was had by all!
(See page 658 for more scenes from Atlanta)*



Participants in the 80th Annual Meeting could choose to attend any of the 175 presentations during the three days of sessions and symposia.

Below, a standing room only crowd attends the first session of the Foodborne Microbial Pathogens symposium, sponsored by the International Life Sciences Institute.



This ice sculpture microscope was donated for the Awards Banquet by the Packaged Ice Institute, represented by Charlie Felix



IAMFES President-Elect Harold Bengsch (left) and Wilbur Feagan unveil the Black Pearl Award. Sponsored by the F & H Food Equipment Company, this award will be presented for the first time at the 1994 Annual Meeting in San Antonio. The Black Pearl Award will recognize a company for its outstanding achievement in corporate excellence in food safety and quality.



Dave and Iris Fry enjoy the reception prior to the Annual Awards Banquet.



At right, John Bruhn presents Henry Atherton (left) with a special Award of Appreciation for his many years of service as the Technical Editor of Dairy, Food and Environmental Sanitation. Dr. Atherton has retired from that post.

A view of the Annual Meeting Exhibits.

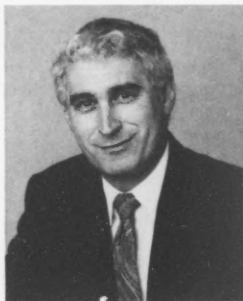


Dave Hamilton (below, left) and Joe Huseman survey the complimentary dairy products in the exhibit area.

Meeting attendees' children shoot some "hoops" (below) in the Children's "Get-Away" Room, sponsored by General Mills Restaurant, Inc.



1993 Presidential Address



Michael Doyle, IAMFES President

Presented at the
80th IAMFES Annual Meeting, Atlanta, Georgia
August 1, 1993

FY 92-93 — It Was a Very Good Year!

As IAMFES becomes an international forum for food safety, the organization has introduced several nuances to meet members' professional needs and strengthen its position as a leading professional society addressing food safety issues. Included were: acquisition of new headquarters offices in Des Moines, restructuring committees, reorganization of editorial management of the *Journal of Food Protection*, initiating strategic, long-range planning, and involving the International Life Sciences Institute in the association's annual meeting.

The IAMFES office in Ames, Iowa served the association well for many years. However, as our need for a larger staff to provide better membership services and enhance our publication capabilities increased, we outgrew the facilities. The new home of IAMFES in Des Moines not only better provides our space and office needs, but also is readily accessible to an airport. Members are invited to visit their association offices when in the Des Moines area.

Committees within IAMFES had evolved to include a variety of working groups with very different goals and functions. Some were short-term and had very specific goals that once accomplished resulted in dissolution of the committee. Some others, like the Affiliate Council and Foundation Fund, were inappropriately identified as committees because they did not function as such. There clearly was a need to better structure our committees. Thanks to the efforts of Harold Bengsch and Dee Clingman, a new organizational structure for our working groups was developed and implemented. Our new organizational structure includes: Committees which are identified in the IAMFES By-Laws and are led by a Chairman, Professional Development Groups which are established to address ongoing projects that promote members' professional development or further the association's goals and are led by a Group Director, and Task Forces which are established to address single task projects which normally can be accomplished in 2 years and are led by a Task Leader. The IAMFES Foundation Fund and Affiliate Council will be separate organizational units functioning within IAMFES under established By-Laws. Leaders of each of these new organizational units will have designated terms of appointment. It is anticipated that these changes will lead to greater involvement of the membership in IAMFES activities and affairs.

One of the major strengths of IAMFES has been its highly regarded *Journal of Food Protection* that rates among the best of publications on the microbiological safety of foods. The success of this journal is largely attributable to Elmer Marth and Lloyd Bullerman who as editors have set the direction and scientific standards for its publication. The importance of the journal to IAMFES members is reflected in a recent membership survey which identified their subscription to JFP as one of the principal reasons many members belong to IAMFES.

To reduce the administrative distractions of handling and publishing manuscripts of the JFP editor, a new approach to handling papers will be introduced in January 1994. Details will be provided elsewhere but this new system will allow JFP editors to focus their talents on evaluating the scientific merits of manuscripts rather than having to manage all aspects form secretarial responsibilities of posting papers to received to copy editing. In addition, a second editor will be added to the journal's scientific staff to reduce the manuscript load for a single editor and allow editors the opportunity to commit to set-term appointments rather than indefinite terms.

Membership in IAMFES peaked in 1989, with 3152 members and has decreased to 3000 in 1993. Considering the many benefits and services IAMFES provides to meet the food safety professional's needs and the emphasis being placed by consumers, regulatory agencies, and the industry on the safety of foods, membership in IAMFES should be growing at an unprecedented rate. In July 1992, a Strategic Planning Task Force was established to address this and other issues affecting the long-term viability of IAMFES. The Task Force met at the 1992 Annual Meeting with a representative of Lawrence-Leiter and Company that specializes in strategic planning for professional societies and not-for-profit associations. Ideas were provided that formed the basis for questionnaires to be used in a telephone survey of the membership.

The survey involved interviewing 300 individuals that include: 100 members of both IAMFES and an Affiliate, 100 members of IAMFES only (not an Affiliate), and 100 members of an Affiliate only (not IAMFES). Some very revealing and informative results were obtained. Highlights of this study included:

IAMFES and Affiliate Members

- 58% joined IAMFES to receive one of its journals. 86% retain their membership to receive on or both journals.
- 73% subscribe to the *Journal of Food Protection*
- The overall value of membership was highly rated (3.3/5.0) for the dues dollar; many said IAMFES membership is a bargain.
- 42% identify IAMFES as their primary professional society
- 52% have never attended an annual meeting

IAMFES Members Only

- 56% joined IAMFES to receive one of its journals; 77% retain their membership to receive one or both journals
- 84% subscribe to the *Journal of Food Protection*
- The overall value of membership is highly rated (3.8/5.0) for the dues dollar; Lawrence-Leiter indicated that rarely have they received so many comments about the good value for the price
- 22% identify IAMFES as their primary professional society
- 76% have never attended an annual meeting
- There were many indications that barriers (very narrow scope; milk only) discourage Affiliate membership

Affiliate Members Only

- 83% are familiar with IAMFES; 56% have been asked to join IAMFES
- 57% work for a government/regulatory agency
- 51% are not members of a national professional organization
- Many indicate their interests are different, i.e., either narrower or only tangentially related to IAMFES
- Some respondents did not know their Affiliate is associated with IAMFES; they thought it was associated with the National Environmental Health Association

Some of the general observations and recommendations of the Lawrence-Leiter report included:

1. Pay attention to the journals; the number one concern of IAMFES is the quality of its journals
2. Pay attention to the needs of the international members
3. Develop white papers on food safety issues (4.2/5.0)
4. Publish symposia, organize special interest sections, hold regional educational programs (3.8-3.9/5.0)
5. The Affiliates attract a somewhat different member than IAMFES, making it unreasonable to assume that all Affiliate members will join IAMFES.

The Strategic Planning Task Force will now use the results of this study to provide recommendations on what should be done to increase membership and provide the best in professional services and benefits.

A major contribution to the 1993 Annual Meeting was the participation of the International Life Sciences Institute (ILSI) that sponsored several timely symposia of international significance. ILSI is a highly respected, internationally-recognized organization that sponsors food safety-related research. The involvement of ILSI in our Annual Meeting was mutually beneficial, providing a forum for presentation of ILSI-sponsored research and an opportunity for IAMFES to involve internationally-recognized food safety scientists in its program.

Financially, IAMFES has made tremendous strides during the past five years in balancing its budget. Profit or losses from 1988-1992 were as follows:

1988	-\$ 53,766
1989	-\$ 49,459
1990	\$ 8,324
1991	\$ 14,341
1992	\$108,783

In 1992 the fiscal year was changed to July 1 - August 31 in order to include the income and expenses of the most recent Annual Meeting in the fiscal year annual financial statement. Hence, FY92 has two additional months and the income and expenses for two Annual Meetings instead of one. Much of the credit for this financial turn around goes to Steve Halstead who as astutely increased the profitability of our Annual Meetings. The Executive Board and Steve have worked diligently to keep expenses in check and erase the association's debt. Although expenses continue to increase, the Executive Board has chosen not to increase dues for FY 94. The estimated profit for FY 94 is less than \$10,000; a dues increase for FY 95 may be needed unless IAMFES experiences a major increase in members and greater attendance at its Annual Meeting.

All in all, FY 92-93 was a very good year for IAMFES. Let's work together to make FY 93-94 even better.

More Scenes from Atlanta



A number of IAMFES Past Presidents and their spouses were on hand for the Past Presidents' Dinner, Tuesday Night. Enjoying the evening were: (seated, left to right) Sarah Case, Eileen Gravani, Iris Fry, Grace Sanders, Elsie Townsend, Pat Arledge, and Shirley Marshall; (second row) Bob Gravani, Helen Haverland, Dave Fry, Bob Sanders, Leon Townsend, Phyllis Atherton, Sally Wright, and Bob Marshall; (third row) Ron Case, Harry Haverland, Dick Brazis, Rosemary Brazis, Archie Holliday, Evalyn Holliday, Henry Atherton, Earl Wright, and Bill Arledge.



A portion of the Head Table at the Annual Awards Banquet, (from left) Bob Brackett, Debi Brackett, Joe Frank, Ava Brodsky and incoming Secretary Michael Brodsky.

Dave Hamilton, Cheng-An Hwang and IAMFES Secretary Ann Draughon during the Poster Session.



Some of the GAFES members serving on the Local Arrangements Committee were: (from left) Al Fain, Co-chair Joe Frank, Mark Harrison, Jim Camp, Co-chair Bob Brackett and Dave Fry.



At left, Past President Dick B. Whitehead proudly displays his IAMFES ribbons.

Outgoing IAMFES President, Mike Doyle and his wife Annette.



At right, Executive Manager Steve Halstead, and wife Mary talk to Joe Zindulis (left) during the Wine and Cheese Reception.



Members of the 3-A Symbol Council during their meeting: clockwise from front left) Warren Clark, Bill LaGrange, Bob Sanders, Earl Wright, Bill Arledge and Dave Fry.



Highlights of the Executive Board Meeting

The IAMFES Executive Board met four different times over the course of the Annual Meeting. They met all day on July 31; for two hours with the chairpersons of the various IAMFES committees on August 2nd; for two hours in a public meeting on August 3rd, and; for another two and a half hours on August 5th, preceding the Long Range Planning Task Force meeting. The following represents an unofficial summary of the highlights:

1. The Board reported that the use of selection criteria for the awards this year had been very successful, but that some fine tuning is needed. Ruth Fuqua, chairperson of the Awards Task Force of 1994, indicated that the criteria will be published and used for the 1994 awards.
2. President-Elect Harold Bengsch reported on the Black Pearl Award, which is being sponsored by Wilbur Feagan. The Board adopted criteria which will be used in selecting the winner of this prestigious award. A panel of jurors will be named at the November Board meeting.
3. The Board directed the central office to act as a clearing house for individuals interested in volunteering their services in flood clean-up.
4. The Board received a report from P.C. Vasavada outlining a program for recognizing undergraduate students. The Board decided to wait until its November meeting to take final action on this.
5. The Dairy, Food & Environmental Sanitation Management Committee reported that they are in the process of replacing Henry Atherton as the technical editor of the DFES. They are looking at the possibility of using three individuals in place of Henry.
6. The past Presidents Advisory Committee asked that the Board seek "practical" information for inclusion in the journals and the Annual Meeting Educational Programming in the future.
7. The Foundation Fund recommended their operating guidelines, which had been put together by the IAMFES Legal Counsel, be adopted. The Board did this.
8. Program Advisory Committee Chairperson Norm Stern reported that the committee will be meeting January 7th and 8th in San Antonio and that they have a large number of proposed symposia that they will be looking at.
9. Meat Quality and Safety Professional Development Group Chairperson, John Cerveny, asked that written protocol outlining procedures to be taken in establishing an IAMFES position on a given topic be established so that all committees and professional development groups could use it in developing position papers.
10. Dairy, Quality and Food Safety Plant Section Chairperson, Gaylord Smith reported that the two problems that had been submitted by the group to the National Conference on Interstate Milk Shippers had been adopted and that implementation dates would be set soon. (These dealt with the addition of vitamins to milk and the method by which the amount of vitamins added to the milk are to be measured.)
11. Charlie Felix, chairperson of the Food Sanitation Professional Development Group, said the group is working on a number of projects including some which will be aimed at lay people.
12. The Food Safety Network Professional Development Group's Chairperson, Bob Clark, reported that efforts are being made to make people aware of existing networks and to the possibility of establishing other networks that might be needed in the area of food safety.
13. Secretary Ann Draughon indicated that she is in the process of identifying what is available for elementary and secondary students in food safety materials and will be looking at developing a curriculum involving food safety.
14. The Developing Scientist and Poster Competitions Awards were changed so that for 1994 there will be three awards; first, second, and third place for each competition. The monetary awards will be \$500.00; \$300.00; and \$100.00, respectively.
15. President Mike Doyle reported that IAMFES is working on a new logo for use on stationery and other printed materials and that there will be a final version to look at the November meeting.
16. The Board voted to charter the Metropolitan Association of Dairy, Food & Environmental Specialists as an Affiliate. (This group is based primarily in New Jersey with some overlap into the New York City metropolitan area.) Don Hammer will be the group's first president.
17. The Board received an anonymous gift of \$250.00 to be used to ship dated journals to the FAO in Rome for distribution to third world countries.
18. The Board discussed the staffing needs for the central office, looking at possible reorganization of the headquarters.
19. The Board acted upon the recommendation of the Journal of Food Protection Management Committee to have two scientific co-editors with staggered four year terms and then went on to name Lloyd Bullerman for a two year term and Larry Buechat to a four year term.
20. Mr. Halstead reported that IAMFES had received a \$1,000.00 grant from DFISA as a part of their "Partners in Education" Program. This money will be placed in the Foundation to be used for educational programming.

Minutes of the IAMFES 80th Annual Business Meeting

3:15 p.m. August 3, 1993 Atlanta, Georgia

Welcome and Introduction: President Elect Harold Bengsch welcomed those assembled and introduced IAMFES President Michael P. Doyle.

Presidential Address: Mr. Doyle proceeded to deliver the 1993 Presidential Address.

Business Meeting:

I. Call to Order: Following his address, President Doyle called the 80th Annual Meeting of the International Association of Milk, Food, and Environmental Sanitarians, Inc. to order at 3:54 PM on Tuesday, August 3, 1993 at the Stouffer Waverly Hotel located in Atlanta, Georgia. A quorum, as defined by the IAMFES Constitution, was declared to be present.

II. Moment of Silence: Mr. Doyle asked the audience to rise and to observe a moment of silence in memory of departed colleagues.

III. Minutes of the Last Meeting: Secretary F. Ann Draughon reminded the meeting that the Minutes of the 79th Annual Meeting had been printed in the November, 1992 issue of *Dairy, Food, and Environmental Sanitation*.

MOTION To dispense with the reading of the Minutes
Brodsky of the 79th Annual Meeting and to approve
Brazis them as printed in the November, 1992 *Dairy*,
PASSED *Food, and Environmental Sanitation*.

IV. Reports:

The meeting then received the following reports:

- A. Executive Manager: Steven Halstead
- B. Affiliate Council: Ruth Fuqua
- C. *Dairy, Food, and Environmental Sanitation* Management Committee: John Bruhn. Mr. Bruhn made special note of the fact that Henry Atherton was retiring from the position of Scientific Editor of *Dairy, Food and Environmental Sanitation*, a position he has held since the publication was founded.
- D. *Journal of Food Protection* Management Committee: Joseph Frank.

Mr. Doyle thanked all who had served on the various Committees, Professional Development Groups and Task Forces and called attention to the fact that reports of the meetings held on August 1 were posted outside the lecture rooms. Appreciation was expressed to Ruth Fuqua for her outstanding leadership of the Affiliate Council and her service on the Executive Board.

V. Old Business: Norman Stern, chairman of the Nominating Committee reported that Randy Daggs and Michael Brodsky had been nominated to the office of IAMFES Secretary and that in the ensuing election, Mr. Brodsky had been elected to the post. The President thanked Mr. Stern and his committee for their work and directed Mr. Stern to destroy the ballots.

There was no other Old Business to come before the Association.

VI. New Business: President Doyle named Lawrence Roth as Chairman of the Nominating Committee for the 1994 election of the IAMFES Secretary.

Mr. Doyle welcomed the newly elected Secretary, Mike Brodsky and the new affiliate council chairperson, Charles Price to the IAMFES Board.

Appreciation was expressed for the outstanding contributions of the past-president, Mr. Gabis; his efforts in helping the organization to become fiscally sound during his tenure on the Executive Board were recognized.

There was no other New Business to come before the Association.

VII. Resolutions: Immediate Past President Damien Gabis presented three resolutions to the meeting for its consideration:

Resolution #1: Relating to the meeting's gratitude to the Georgia Affiliate for their outstanding performance as hosts of the 80th Annual Meeting.

MOTION To adopt Resolution #1.
Gabis
Sanders
PASSED

Resolution #2: Relating to the meeting's gratitude to the Stouffer Waverly Hotel for its outstanding performance in serving the 80th Annual Meeting.

MOTION To adopt Resolution #2.
Gabis
Darrah
PASSED

Resolution #3: Relating to the meeting's gratitude to the Institute of Life Sciences for its outstanding contributions to the educational programming of the 80th Annual Meeting.

MOTION To adopt Resolution #3.
Gabis
Brazis
PASSED

President Doyle directed that the resolutions be attached to these Minutes as Addenda and that they be printed in an upcoming issue of *Dairy, Food, and Environmental Sanitation*.

VIII. Adjournment: There being no further business to come before the meeting, President Doyle called for a motion to adjourn.

MOTION To adjourn.
Brodsky
Fry
PASSED

President Doyle declared the meeting adjourned at 4:49 p.m.

Respectfully submitted,
F. Ann Draughon, PhD.
Secretary

Resolutions Adopted by IAMFES

RESOLUTION #1

WHEREAS: The Georgia Association of Food and Environmental Sanitarians and the Local Arrangements Committee have labored long, hard and with joy to plan, coordinate and host the 80th Annual Meeting of the International Association of Milk, Food and Environmental Sanitarians in Atlanta, Georgia and,

WHEREAS: The entire Annual Meeting was conducted and planned with style, grace and excellence by the Affiliate and the Local Arrangements Committee, and,

WHEREAS: The gracious hosts coordinated the efforts of industry, educational and governmental members towards the great success of this Annual Meeting, and

WHEREAS: The 1993 Meeting was truly an outstanding event and contributed to the goals of our Association.

THEREFORE, BE IT RESOLVED: That the International Association of Milk, Food and Environmental Sanitarians, Inc. adopt this resolution of appreciation and gratitude to the Georgia Association of Food and Environmental Sanitarians and the Local Arrangements Committee and further that a copy of this resolution be sent to the Georgia Association of Food and Environmental Sanitarians and be published in *Dairy, Food and Environmental Sanitation*.

RESOLUTION #2

WHEREAS: The personnel of the Stouffer Waverly Hotel, Atlanta, Georgia were very accommodating to the needs and desires of the members and guests of the International Association of Milk, Food and Environmental Sanitarians, Inc., and,

WHEREAS: The facilities for the entire program including the technical sessions and social activities were outstanding.

THEREFORE, BE IT RESOLVED: That an appropriate expression of our gratitude be sent to the management and staff of the Stouffer Waverly Hotel.

RESOLUTION #3

WHEREAS: The International Life Sciences Institute through their Program Committee and Administrative Staff volunteered to sponsor five symposia at the 80th Annual Meeting of IAMFES.

WHEREAS: Through the invitations extended by the International Life Sciences Institute, internationally distinguished scientists were participants in and contributed to the success of the 80th Annual Meeting.

WHEREAS: The Administrative Staff of the International Life Sciences Institute, namely Catherine Nnoka and Beth Brueggemeyer met and exceeded all expectations in making the arrangements and conducting the administrative work necessary for the success of this cooperative effort between the International Life Sciences Institute and IAMFES.

THEREFORE, BE IT RESOLVED: That IAMFES recognizes, deeply appreciates and commends the International Life Sciences Institute for their unparalleled contributions to the success of this the 80th Annual Meeting of IAMFES.

Committee, Professional Development Group and Task Force Reports

Dairy, Food and Environmental Sanitation Management Committee

Members Present: Ex-Officio: Robert Marshall, Joe Frank, Steve Halstead, Margaret L. Marble, Harold Bengsch, Mike Doyle and Henry Atherton

Committee Members: Bill La Grange, P. C. Vasavada, Bob Gravani, Bob Sanders and Tom Gilmore

Committee Members Absent: Floyd Bodyfelt and Bill Coleman

Others Present: Nelson Cox, Chris Newcomer, Earl Wright and others from time to time.

Presiding: John C. Bruhn, Committee Chairman

Summary of Actions and Activities:

1. The committee affirmed its recommendations of an earlier telephone conference call to make the Journal's style elements including author and reference citations, abbreviations, table style and size and abstracts (summary) consistent with each issue and to the extent possible in accord with the *Journal of Food Protection*. These changes will be reflected in the "Instructions to Authors".
2. With the retirement of Dr. Henry Atherton as technical editor, the committee agreed that three technical editors reflecting interests in food, dairy and environmental sanitation should be appointed to work with Ms. Marble.
3. Results of the "best paper award" were announced by Ms. Marble. The winners will be recognized at the IAMFES Banquet. The process by which the committee selects the winners was reviewed. Chairman Bruhn and Ms. Marble will offer a revised scheme for the committee to review by mail.
4. The committee agreed to have journal articles "defined" by a header, including "Research Article," "Review Article," and "Perspective on the Issues," or a similar header title to reflect an article of a broader nature and reflecting an author's experience in "the field."
5. Ms. Marble and Bruhn will develop a publication "flow diagram," for committee review, showing the involvement of the newly appointed technical editors and that of a technical copy editor to be hired by IAMFES by January 1994.
6. Bruhn and Halstead reviewed the membership survey regarding the value, quality, and appropriateness of the Association's two journals. These should be in the mail to the membership by Fall 1993.

Recommendations to the Board:

1. That F. W. Bodyfelt and R. Sanders be re-appointed to a three year term effective following the 1994 Annual Meeting in San Antonio, Texas.
2. That funds be allocated to support two telephone conference calls for the committee in the Fall of 1993 and before the 1994 Annual Meeting.
3. That three technical editors be appointed with one representing each of our Association's interest areas: milk, food and environmental sanitation.

Journal of Food Protection Committee Report

Members Present: Doores, Bruhn, Cousin, Todd, Hall, Bullerman

Presiding: Joe Frank

Summary of Activities and Action Taken:

Dr. Maribeth Cousin was appointed secretary. Committee actions taken during the past year included proposing a change in the editorial activities of the Journal to include two scientific co-editors and a technical/copy editor. The technical/copy editor will be located in the Des Moines office. The scientific co-editors will serve staggered four year terms. Dr. Larry Beuchat and Dr. Lloyd Bullerman have agreed to serve as scientific co-editors. A new manuscript process flow chart has been developed in cooperation with the Des Moines office. The committee discussed the current "Instructions for authors" and agreed that the scientific editors have the authority to return manuscripts to authors if they do not conform to the "Instructions". In addition, the committee asked the scientific editors to revise the "Scope of the Journal" statement to place greater emphasis on food protection. In addition, consumer aspects of food protection will be added to the "Scope of the Journal" statement. The committee discussed the issue of author anonymity, and agreed that the names and affiliations of manuscript authors should be removed from the manuscript before it is sent to reviewers.

Nominating Committee

Members Present: Ron Case, Joe Frank, Kathleen Glass, Randy Hanson, Paul Nierman

Presiding: Lawrence Roth

The responsibility of the Nominating Committee is to present two candidates to the Executive Board, for the position of Secretary of IAMFES for the 1994-95 year. For this

term, the candidates will represent the industry sector of our membership.

A call from the membership for recommendations of suitable candidates is being launched through this report and an announcement in upcoming issues of *Dairy, Food and Environmental Sanitation*. The committee will select two finalists from the preliminary list of candidates and present these to the Board. The successful candidates will be elected by the IAMFES membership via a mail ballot early in 1994.

Program Advisory Committee

Twenty to twenty-five individuals were in attendance. The appointed Program Advisory Committee (PAC) shall meet on Wednesday (8/4/93) to refine suggestions and begin to shape the 1994 IAMFES Annual Meeting programs. PAC shall provide Dee Clingman with a status report. The PAC shall meet to finalize the program during the weekend of January 7-8, 1994.

Continued input from the membership, as well as their direct involvement, is especially required from those want "Applications" type of symposia. The substantial input to the '93 meeting program from ILSI was noted with appreciation and is solicited for next year's meeting.

The following is a list of suggested topics for symposia and workshops. The list is not yet prioritized, nor is in its final format.

Workshops:

1. Pasteurization - hands on provided by Texas Affiliate
2. Quality Assurance
3. Rapid Methods
4. Information retrieval

Symposia:

1. Dairy Topics
2. Water Quality influenced by Sewage/Sludge Application on Farm Lands
3. Water and Foodborne Disease associated with Floods
4. Disaster Preparedness
5. Mycotoxins in Feeds/Foods
6. Verotoxigenic *E. coli*
7. Dairy Food Safety and Quality
8. Topics pertaining to Baking
9. Food Safety in Mexico and Latin America
10. Food Safety for Immunocompromised
11. Environmental Contaminants or Health Hazard
12. Tampering and Food Safety Concerns
13. International Trade and Microbial Food Quality
14. Microbial Loads and Food Contact Surfaces
15. New Series of ILSI Research Updates
16. Controlling Pathogens from Farm to Food
17. Hands on Computer Access to FDA Communications
18. Removing Bacteria from Biofilms
19. Potential Software for Applications to Food Scientists
20. Food Safety Concerns in Texas and Mexico, such as involved Migrant Workers, Potentials for Fruit Contamination, Travelers Diarrhea
21. Risk Assessment, Analysis, Management, Education

- and Communications
22. Microbial Control related to GATT
23. Chemical Contamination and Risk Management
24. Microbial Control during Animal Production
25. Microbial control during Animal Processing
26. Methods Development - AOAC and ISO approach
27. Lab Accreditation and Analyst Certification
28. Sanitation in Space
29. Irradiation Processing
30. Designing Safe Foods-Risk Assessment
31. Biotechnology of Food Flavors
32. Implications of *E. coli* O157 Outbreak in Retrospect
33. Food Hygiene in Cannabolism and/or other Far-out and Stimulating Topics

Submitted by: Norm Stern

Past President's Advisory Committee

Members Present: Henry Atherton, A. R. Brazis, Ron Case, Dave Fry, Damien Gabis, Harry Haverland, Bob Sanders, Earl Wright, Mike Doyle, Ann Draughon, Steve Halstead

Presiding: Damien Gabis, Immediate Past President

Summary of Activities and Actions Taken:

1. Compliments to the Central Office Staff for responsiveness
2. Update on Long Range Planning Task Force Activities
3. Discuss Life Membership Proposal Survey
4. Newsletter for Past Presidents, Committee Chairs, Affiliate Presidents, Delegates and Secretaries
5. Discussion of Annual Meeting Program content and practical content of *Dairy, Food and Environmental Sanitation*.

Suggestions to the Executive Board:

1. Exercise caution in considering implementation of life membership proposal, e.g., long term financial benefits to IAMFES.
2. Increase practical content of Annual Meeting program. Add content for field workers - they want to learn about applied approaches to their professions.
3. Increase practical/technical content of *Dairy, Food and Environmental Sanitation* magazine.

PROFESSIONAL DEVELOPMENT GROUPS

Applied Laboratory Methods Professional Development Group

Members Present: The meeting was attended by 34 members, including the Professional Development Group's officers. The attendees represented regulatory agencies of both the United States and Canada, industry and academia.

Presiding:

Chair: James S. Dickson, Iowa State University

Vice-chair: Thomas E. Graham, Food and Drug Administration

2nd Vice-chair: J. Sue McAllister, 3-M Healthcare

Summary of Activities:

Approved minutes of 1992 annual meeting.

Old Business: The extended incubation of coliform MPN method; manuscript prepared and submitted to *Journal of Food Protection*, refrigeration of pre-inoculated plates; data has been summarized and manuscript is in preparation; Michael Brodsky asked for any additional input for the manuscript. Tom Tieso asked if this information could be submitted for consideration as an official BAM method; Michael Brodsky agreed to explore this after the manuscript had been submitted and reviewed by *Journal of Food Protection* update on the two short courses coordinated by the Applied Laboratory Methods Professional Development Group. Quality Assurance for Microbiology Laboratories; Michael Brodsky reported that he had 30 participants and that the course was well received. Rapid Microbiological Methods; Jim Dickson reported that Dan Fung's class had 35 participants and was generally well received. An update on IAMFES resource list which was forwarded to the Executive Committee. No additional old business.

New Business: The new organizational structure was reviewed, relating to the change from "Committees" to "Professional Development Groups". Lawrence Roth gave a short presentation of the AOAC Research Institute's Performance Validation of test kits. Essentially, a "fast track" procedure to validate manufacturer's claims. Michael Brodsky questioned how this would affect the existing AOAC collaborative certification efforts. Suggestions for new Group projects. Michael Brodsky suggested a collaborative study to examine upper counting limits for selective media; interested parties were to contact him directly. Jim Dickson suggested that the Group coordinate a symposium at the 1994 annual meeting; a discussion followed with the consensus that the topic would be laboratory methods and relationship to HACCP programs. Lawrence Roth suggested a collaborative project on a survey for *Escherichia coli* O157:H7; Jim Dickson asked interested parties to contact him to discuss methods and products to be tested. There was an informal discussion relating to a variety of testing methods and instrumentation. The meeting was adjourned at 3:00 PM.

Audio Visual Professional Development Group Meeting Report

Members Present: T. McCaskey, T. Gilmore, R. Schmidt, G. Swick

Presiding: R. Schmidt

Summary of Activities and Actions Taken:

- FYE 8/31/93 Budget was present and discussed.
- Buske presented a tabulation of usage date for lending library materials. IAMFES Ex. Off. was commended for their efforts in data base development and tracking. The

number of requests has increased to 1016 in 1993 compared to 810 in 1992 and 899 in 1993. As of 6/30/93, approximately 300 potential lenders are on waiting status suggesting a need to obtain additional back-up copies of library materials. Gilmore moved that Buske be instructed to obtain additional copies as appropriate such that a minimum of 2 holdings exists for each videotape and that additional tapes be obtained (not exceed 6) for those with high usage. Motion carried.

- The lag time in returning of materials and damage to materials was discussed. Gilmore suggested that a 3 week maximum time period plus a \$25 deposit be adopted for all lended materials with a late fee assessment at \$5/day beyond the loan period. The deposit plan was postponed to be re-addressed in one year to allow further evaluation of data as to need, benefits, and risks of such a plan.
- The desirability of obtaining additional information into the tracking data base such as anticipated audience, expected attendance, etc. Buske has indicated that the response rate of the currently used evaluation form was sporadic. It was suggested that Buske revise the application form to obtain such information up-front. Tabulating such information will help demonstrate the usefulness of the lending library.
- The review process for potential acquisitions was discussed. Schmidt suggested that the process could be streamlined by making review copies of videotapes (with permission) to be sent out directly to reviewers from the IAMFES office. This policy could avoid the time-lag involved with a single videotape being sent from one reviewer to the next.
- The continuous efforts to identify new acquisitions was discussed. Gilmore discussed certain listings available and it was suggested that all members increase their efforts in this regard.
- Postage costs were discussed. Buske was directed to investigate using the U. S. Postal Service 2-day guarantee delivery as a viable alternative. Expected costs are at or lower than UPS.

Baking Industry Sanitary Standards Professional Development Group

Since 1949, members of the IAMFES BISSC Committee have played a vital role in formulating and preserving Public Health Requirements and eventual publication of construction standards covering (42) categories of Baking Equipment.

Over the past four or five years, the IAMFES Committee of BISSC has been called upon to act in a consulting capacity to the General BISSC Committee and the BISSC Office of Certification in an ever increasing number of areas.

As Chairman of the IAMFES BISSC Committee, I represented IAMFES at the 1993 Annual Meeting in Chicago in February and served in a consulting capacity to the Task Committee regarding proposed revisions to Standard #29 (Electric Motors) which were accepted by the Committee and forwarded to the Executive Board where they were accepted and published.

At the 1993 Annual BISSC Meeting I was requested to serve as a consultant to the Long Range Planning Committee and am presently serving in that capacity.

In an effort to create an interest in the BISSC program and recruit sanitarians to serve on the Task Committees of BISSC, I requested that a Symposium on the BISSC program be presented at the IAMFES Annual Meeting in Atlanta, GA in August. The Executive Board of IAMFES accepted my request to have a Symposium and have scheduled it to be on the program to be presented during the afternoon of Monday, August 2, 1993. The program will be listed as a Symposium on Baking Equipment Standards and General Sanitation in Baking Operations.

Among our goals for the future will be to contact Sanitarians with expertise in Bakery Sanitation and Equipment Review and request their participation in the activities of BISSC and future Symposia and to suggest changes that would be beneficial in making standards more practical and all inclusive.

Respectfully,
Martyn A. Ronge, Chairman
IAMFES BISSC Committee
2400 Farnsworth Lane
Northbrook, IL 60062

Communicable Diseases Affecting Man Professional Development Group

Members Present: F. L. Bryan, O.D. Cook, J. J. Guzewich, D. Maxson, R. C. Swanson, E.C.D. Todd

Presiding: Frank Bryan

Summary of Activities and Actions Taken:

1. Survey of use of HACCP by state, provincial and local food protection agencies has been completed and published in *Dairy, Food and Environmental Sanitation*. This project may be repeated with improvements in a few years. Interest and implementation of HACCP systems are rapidly expanding.
2. A project on foodborne disease surveillance (which may become either a manual, journal article or addition to Procedures to Investigate Foodborne Disease manual) has been initiated. A manual will take a few years to complete.
3. The number of copies of "Procedures to Investigate Foodborne Illness" is down to 150 copies. Hence, revision (but not a new edition) is under consideration for the next printing.
4. Copies of "Procedures to Investigate Waterborne Illness" have been depleted and small numbers are being reproduced to meet requests. Because of recent waterborne disease outbreaks, the demand for this manual is increasing. This manual is now 14 years old and a major revision is called for. Such a task requires 2-3 years to complete. Assistance is needed from persons with expertise in investigation of outbreaks of waterborne diseases.
5. Over 6,000 copies of the manual "Procedures to Imple-

ment the Hazard Analysis Critical Control Point" manual have been sold. Training courses have been based on it. A Spanish translation has been made in Argentina and is being used in some Latin American Countries. A Chinese translation has been done in China. Many manuals and related materials have been developed in recent years by industry groups, advisory committees, and international organizations. Hence, there is a vast source of references, but some of these have different definitions and approaches which has led to some confusion and misunderstanding about the HACCP concept.

Dairy Quality and Safety Professional Development Group

The Dairy Quality and Safety Committee is divided into two groups: the Farm Section, chaired by Mr. John Scheffel and the Plant Section chaired by Mr. Gaylord Smith. Each section also has a leadership cadre.

The Farm section leadership cadre includes Mr. Ted Hickerson, Ms. Brenda Holman, Mr. Terry Mitchell, Mr. Charles Price, Mr. Joseph Scolaro and Mr. Gary Trimmer.

The Plant section leadership cadre includes Dr. Sid Barnard, Mr. Robert Darrach, Mr. J.J. Jezeski, Ms. Diane Lewis, Mr. Darwin Kurtenbach, Ms. Ginny McArthur, Mr. William McCarty, Mr. Vince Mills and Mr. Bruce Meyers.

Both sections share a common mission statement:

"This IAMFES committee works to improve quality and safety in production, processing and distribution of dairy products from farm to consumer."

Each section works toward this goal using the same key activities:

- Identify the needs of the dairy industry.
- Develop procedures and recommendations which address these needs.
- Disseminate information to appropriate dairy industry groups.

Farm section chairman John Scheffel conducted a meeting on Sunday, August 1, 1993, starting at 10:25 am, minutes of the July 26, 1992 meeting were accepted as presented.

The application to install or modify a milking system was published in *Dairy, Food and Environmental Sanitation* in January 1993.

At the previous meeting we had two tasks which were not completed:

1. A communication liaison group was set up to share information with the Northeast Dairy Practices Council (NDPC). This committee further recommends to the IAMFES Board to pursue with the Northeast Dairy Practices Council a means to distribute or provide the NDPC Guidelines to all IAMFES members, as more in depth information to the Dairy Farm Field persons, as well as having a set of guidelines in the IAMFES library since one charge is to disseminate information to the appropriate dairy industry groups.
2. To explore the need for and feasibility of this group to produce an update dairy farm field persons handbook.

Charles Price will chair the task force along with members Allen Sayler, Ken Kirby, Terry Munson, Phil Hermson, Don Briner, Bob Darrah, Gary Trimmer and Allen O'Hare to develop the field persons handbook.

3. Concern expressed to the small amount of dairy issues on the IAMFES program.
4. List of people for technical reference.
Ken Kirby - Phone/FAX - 414-563-3248
Phil Hermson - 715-526-2131
John Scheffel - 301-370-4370 FAX
800-233-100 Phone

The meeting of the Plant section was called to order on Sunday, August 1, 1993, at the Stouffer Waverly Hotel in Atlanta, Georgia.

The meeting was called to order by chairman, Gaylord Smith. The minutes were approved and received on a motion by Robert Darrah and seconded by Phil Hermson and passed unanimously.

Old Business: regarding the vitamin addition to milk, the volume control problem was accepted by NCIMS with the exception to delete the word "daily." Chairman Smith elaborated on the certification of Laboratories by FDA which was passed by NCIMS as submitted.

The chairman, Chris Newcomer of the "in-plant product separation" committee stated that Harold Wainess and Bob Darrah served with him on the committee. His report included the review of comments received from IMS conference attendees in Dallas, Texas. Mr. Newcomer presented a draft of two documents presented and prepared for Harold Wainess and himself. Jeff Bloom reported on the progress of our Canadian counterpart who is also working on this issue. Chairman Gaylord Smith stressed need to meet PMO requirements and asked that any comments and recommendations be submitted to Chris Newcomer for inclusion. Allen Sayler suggested utilizing all available references.

Additional discussion followed on subject of "in plant product separation." Harold Wainess elaborated his approach to this problem which was to line of context to only handling. Charlie Price added that handling of product at the plant should be addressed, i.e., using returns in ice cream products. Chairman Smith stressed that PMO is a guideline. Jeff Bloom volunteered to offer assistance from Northeast Dairy Council.

Regarding the above as a possible amendment to item 15P of PMO, it was agreed that it would be approached as a PMO appendix. Discussion followed. It was agreed the committee would prepare material for consideration. It was moved by Charles Price, seconded by Bob Darrah and unanimously passed that the committee continue its endeavors on all problem of all milk products that are reworked and/or returned and that the committee work in conjunction with Northeast Dairy Council. It was further agreed that orange juice products and drinks could also be addressed.

On a motion by Terry Musson, seconded by Chris Newcomer and unanimously passed, it was moved that it will be recommended to the Executive Board by Chairman Smith that the guidelines made up by the Northeast Dairy Council will be utilized as a reference resource of IAMFES. Then there would be a follow-up article in the journal.

Chairman Smith read a letter requesting a list of 1 to 3

people to serve as volunteer reference resource for IAMFES members. It was agreed to differ the subject until obtaining clarification from the Executive Board and then the chairman should appoint this committee.

There being no further business, a motion was made by Bob Darrah and seconded by Charles Price and motion passed to adjourn.

Environmental Issues in Food Safety Professional Development Group

Members Present: Jim Black, Roy Carawan, Rob Griffin, Norris Robertson, Allen Sayler, and Harold Wainess

Presiding and Submitted by: Roy E. Carawan, Chairman

Summary of Activities and Actions Taken:

- Water Reuse in Animal Processing Plants Symposium planned for 1993 IAMFES Annual Meeting (August 2, 1993). Nine speakers representing government (EPA and USDA), industry, and universities presented the technological and regulatory considerations involved in the reuse of process and final discharge water in meat and poultry plants. Over 70 people attended and the discussion led to an agreement that better communication is needed to facilitate this important economic and food safety issue.
- President Doyle appointed Roy Carawan to represent IAMFES in planning the Seventh International Symposium on Agriculture and Food Processing Waste to be held in Chicago, December 7-9, 1995.

Meeting Discussion—Recommendations

- The use of consumer wastes into food packaging presents a dilemma for food processors and food service facilities. There is a need to encourage such recycling efforts but there is the risk of introducing contaminants into the food.

There is a need for IAMFES to help educate the public, food processors, sanitarians, and others about this issue.

- Water reuse of cow water in dairy plants is misunderstood and the current regulations and pending regulations may be detrimental to the environment and may not be related to the necessary food safety concerns.

There is an opportunity for IAMFES to sponsor a workshop and educational effort in this area.

- There is insufficient information to assure food safety during and following the 1993 Floods.

IAMFES should help gather information and help sponsor a meeting on this issue. Water quality for the processing and preparation of foods should be the focus of this activity.

- There is a need for more information about environmental issues as they impact food safety.

IAMFES should publish educational materials for its members and others to purchase. The Executive Committee is asked to provide funding and guidance to help accomplish this worthy goal. Funding is needed to sponsor a planning committee meeting to decide on the

contents and assign responsibilities. Funding is needed to print the finished documents. It is anticipated that 75-100 pages of material will be included in this document. Permission has been obtained to utilize information already prepared on federal regulations by the Region VIII EPA office. An initial draft outline is attached.

**Everything You Wanted to Know About the
ENVIRONMENT AND FOOD SAFETY
But Were Afraid to Ask**

Preface

Introduction

Protecting Our Environment and Food Safety

Cross Media Regulatory Programs

Asbestos

Indoor Radon

Lead

Pesticides

SARA Title III—Emergency Planning and
Community Right To Know Act

Toxics - PCBs

Air Regulatory Programs

Land Regulatory Programs

RCRA Hazardous Wastes

Subtitle D-Municipal Solid Waste Landfill Criteria

Underground Storage Tanks

Superfund

Water Programs

Wetlands Protection

Water Protection

NPDES Program for POTWs

Injection Wells

Industrial Wastewater

Pretreatment Program

NPDES Program

Safe Drinking Water

Food Safety Issues

Chemical and Microbial Quality of Water for

Processing and Preparation of Food

Water Reuse

Recycling consumer waste into food packaging
materials

Food Residues

Feeding regulations and safety concerns

Food Service

Food Processing

Peel and Trim

Pretreatment/Treatment

Soil Amendments and Fertilizers

Composting

Risk

Disaster Planning and Management

Definitions

Resources and Contacts

**Food Safety Networks
Professional Development Group**

Members Present: R. Clarke, D. Fung, N. Bean, M. Brodsky, A. Lammerding, P. Hibbard, M. Woodlawn, M. Robbins

Presiding: R. Clarke

This was the first meeting of this recently formed Professional Development Group. Contacts have been made with the major networks in Canada and the USA. Representatives from the major networks have agreed to participate in this group. It was felt by the group that it would be very useful to prepare a list of food safety networks etc. that could be used as a reference document to direct interested persons to the appropriate contacts. This information could be stored on disk and updated annually. A symposium will be held on Wednesday p.m. August 4th to highlight activities of selected networks.

1. That a document listing networks, contacts and essential information be assembled by the PD group. This information could be produced as a separate booklet or as part of the IAMFES directory.
2. That the board help with development of a consent form to be signed by groups supplying information.
3. That a workshop be held at the next meeting (Texas) to allow "hands on" experience with using and accessing food safety computer networks.

**Food Sanitation
Professional Development Group**

Members Present: Charlie Felix, Dave Dobosch, Bennett Armstrong, Larry Eils, Marsha Robbins, Harry Haverland, Marilyn Lee, Tom Schwarz, John Marcello, Margy Woodburn, Susan Grayson, Phil Ventresca, Gloria Swick, Norris A. Robertson, Jr., O. Peter Snyder

Presiding: Charlie Felix

I. Mission:

The group articulated its mission as follows:

To develop awareness of the importance of food safety within the membership and the profession and to targeted groups outside the profession.

II. Objectives:

Group objectives decided upon through 1995:

1. Develop brochures and other educational materials intended for professional and non-professional food handlers.
2. Explore avenues of reaching the school age population regarding the principles of food safety, especially handwashing.
3. Develop, in cooperation with IAMFES affiliates, workshops on timely food safety topics, especially on important foodborne diseases and emerging pathogens.

4. Encourage and assist IAMFES in becoming a resource for print materials (training aids) on food safety.

III. Current Projects:

The group critiqued the first drafts of two print materials in progress:

The "Food Safety Disaster Preparedness" brochure; and "Fifteen Steps to Safe and Sanitary Food Service Events" - a leaflet on food safety in temporary events.

Both of these projects were referred to sub-committees for completion by year's end.

The conference calls are anticipated to complete the projects. A mechanism for translating these materials in Spanish was established.

IV. Projects for 1993-94:

The Group approved the following projects:

- To develop a food safety brochure on food carts and food kiosks.
- To explore with IAMFES affiliates developing a workshop on the topic of "Foodborne Diarrheal Diseases."
- To inventory the food safety curricula currently in use in elementary schools.

V. Subcommittee Assignments: the projects described above have been referred to the following subcommittee chair for action:

Disaster Preparedness: Gloria Swick
Temporary Food Service: Charlie Felix
Food Carts and Kiosks: Susan Grayson
Diarrheal Diseases Workshop: (open)
Elementary School Curricula: (open)

Meat Safety and Quality Professional Development Group

Members present: Dane Bernard, John Cerveny, Al Fain, Kathy Glass, Michael Johnson, Anna Lammerding, Michael May, Jim Price, Leora Shelef, Coleen Stevens, Susan Sumner, Bob Tiffin

Presiding: John Cerveny

The consensus of the newly formed committee is that there is a need to promote meat safety and quality, both nationally and internationally, via IAMFES. A variety of options were considered as to how we could accomplish our goal.

1. The Committee recommended two symposia for the 1994 Annual Meeting:
 - Effect of meat production and processing practices on microbial quality of meat.
 - Meat quality and safety problems through distribution system (fast food establishments, delis, retail stores).
2. In conjunction with the symposiums, develop a poster section devoted to meat research.
3. Consider publication of review papers on meat quality/safety concerns.

Poultry Safety and Quality Professional Development Group

Members Present: Stan Bailey, Norman Stern, Nelson Cox, Bruce Tompkin, Mike Johnson, Fred Hartman, S. Malik, Judy Aulik

Presiding: Stan Bailey

1. Two potential symposia will be suggested to the program planning committee.
2. The PDG will encourage someone to write a review article which will possibly serve as a basis for a white paper about the effect of acids and other feed additives on salmonella in feed.
3. The PDG will begin to work on establishing a statement of the appropriateness of irradiation as a tool to reduce pathogens on poultry. IAMFES may want to adopt this statement as an official position.

The Poultry Safety PDG proposes to organize the following two symposia for next years annual meeting:

1. Reduction of Foodborne Pathogens on Poultry
2. How to Decontaminate a Dry Food, Feed or Ingredient

Sanitary Procedures Professional Development Group

During the past year the PDG held two meetings. The first was October 3, 1992 in New Orleans, Louisiana. This was a SPPDG/USPHS meeting in conjunction with the International Dairy Show.

The other was on May 17-23, 1993 in Milwaukee, Wisconsin with the 3-A Sanitary Standards Committee.

Members attending at least one meeting were:

Joseph Burrow, Randy Chloupek, Dale Cooper, Dan Erickson, A.K. Glover, Joe W. Hall, Jr., Everett Johnson, Norris Robertson, Jr., Ronald Schmidt, Jim Strange, Don Wilding, Michael Hankin

Presiding: Joe W. Hall, Jr.

During the meetings we reviewed fifteen documents. Of those reviewed, ten were approved for signature and publication. The remainder were returned to task committees for additional revision.

In the review of the pump standards, alternative formatting and wording changes were discussed with modifications suggested by sanitarians, users and manufacturers.

The 3-A Sanitary Standards Committees continue to discuss items of mutual interest with the European Hygienic Equipment Design Group. The long range plan will be the use/adoption of each group documents by the other group.

**Seafood Safety and Quality
Professional Development Group**

Attendees: S. S. Malik, B. M. Slabyj, G. Sauve, Isabel Walls, P. Hibbard

Round Table Discussion

General discussion to generate topics on Seafood Safety and Quality for a proposed symposium at the 1994 meeting.

Suggested Topics:

1. Contamination of aqua and marine-cultured seafood species with drug residues.
2. The status of HACCP introduction into the seafood processing industry.
3. *Listeria monocytogenes* in ready to eat seafoods.
4. Pathogens of current concern in the seafood supply, e.g. *Vibrio vulnificus*.

Recommendations to the Executive Board:

Please consider the possibility of developing a seafood safety and quality symposium for the 1994 meeting.

Submitted by: P. Hibbard

**Progress Report of
IAMFES Long Range Planning Task Force**

Task Force Members: Mark Banner, Michael Brodsky, Ron Case, John Cerveny, Warren Clark, Jr., Larry Claypool, Ralph Digiaco, Ruth Fuqua, Robert Gravani, Cameron Hackney, John Kvenberg, Anna Lammerding, Robert Marshall, Mike Stringer, Damien Gabis, Mike Doyle, Harold Bengsch, Dee Clingman, Ann Draughon, Ron Schmidt, Bob Sanders, Steve Halstead, Margie Marble, Scott Wells, David Domsch, David Tharp

Presiding: David Domsch, VP, Lawrence-Leiter and Company is the facilitator for the IAMFES Long Range Planning Process

Submitted by: Damien Gabis, Task Force Leader

The initial meeting was held at the 1992 Annual Meeting in Toronto, Ontario, Canada. The preliminary meeting was held in order for the Task Force to develop/assess the following issues:

1. Present Status of IAMFES.
2. Internal functioning of IAMFES.
3. Strengths, weaknesses, problems, opportunities and suggested actions.
4. Factors influencing IAMFES.
5. Research needs.

A 27-page report of the proceedings of the task force's initial meeting was prepared by Lawrence-Leiter and distributed to the task force members. The preliminary report suggested the need for additional information about IAMFES and its members and potential members.

A survey questionnaire was developed by Mr. Domsch

and the Executive Board. Telephone interviews were conducted with randomly selected 100 IAMFES only members, 100 IAMFES affiliate members, and 100 non-IAMFES affiliate only members.

The report on member and potential member research findings was prepared and distributed to the Executive Board and Long Range Planning Task Force in February 1993. President Doyle will present the highlights of the report at the annual business meeting.

The Task Force is scheduled to meet on Thursday, August 5, 1993, in the Tyndall Room of the Waverly Stouffer from 9:00 am - 3:30 pm to address the following issues:

1. Develop a mission statement saying why IAMFES exists.
2. Develop goals for IAMFES - a set of 3-5 board statements outlining the areas that IAMFES will focus on to accomplish its mission.
3. Develop strategies - statements to set for the activities necessary to reach the goals.
4. Develop specific objectives with priorities that IAMFES is committed to undertaking.
5. Develop tactics: what tasks will be assigned to whom, what resources will be used, time lines, priorities, develop ways to measure success.

The current round of work in the Long Range Planning Process will be completed for formal presentation to the members at the 1994 meeting in San Antonio, TX.

IAMFES AFFILIATE COUNCIL

I. Call to Order

Chairman Ruth Fuqua called the meeting to order at 7:00 a.m.

II. Role Call of Delegates

27 Affiliates had delegates present as follows:

AL - Tom McCaskey
ALBERTA - Lawrence Roth
CA - John Bruhn
CAROLINAS - Elizabeth Johnson
FL - Peter Hibbard
GA - David Fry
IL - Charles Price
IN - Helene Uhlman
IA - Mike Klein
KS - Don Bechtel
KY - David Klee
MI - Robert Taylor
MN - Paul Nierman
MS - Norris Robertson
NE - Susan Sumner
NJ - Fred Weber
NY - Terry Musson
ND - Gary Hoffman
OH - Gloria Swick

ONTARIO - Krista Mountjoy
PA - Michael John
TN - Ruth Fuqua
TX - Kirmon Smith
VA - Donna Izac
WA - Lloyd Luedecke
WI - Joe Disch
WY - Stephanie Whiteman

III. Introduction of Guests

Members of the IAMFES Board in attendance are:

Mike Doyle - President
Harold Bengsch - President Elect
C. Dee Clingman - Vice President
F. Ann Draughon - Secretary
Damien Gabis - Past President

IAMFES Staff are:

Steve Halstead - Executive Manager
Dee Buske - Affiliate Liaison
David Tharp - Finance Manager

Seven guests included Mike Johnson who represented a planned New Arkansas Affiliate.

IV. Approval of Minutes

Moved by Bruhn/seconded by Smith to accept minutes of the July 25, 1992 Affiliate Council minutes as provided.

V. Affiliate Council Update

Chairman Fuqua reported that this year, primarily in response to Affiliate Council Action at the 1992 meeting, we have the following accomplishments:

- A historical reference has been provided to affiliate members primarily through the efforts of Dee Buske who provided each delegate with a manual which includes historical information on the Affiliate Council. It is noted that this year 5 affiliates, Illinois, Iowa, Michigan, New York and Wisconsin celebrate 50 years as affiliate members.
- At our request no meetings were scheduled to conflict with the Affiliate Council Meeting. This is evidenced by the excellent attendance by delegates and Board members.
- The Affiliate Council Chairperson attended all Executive Board Meetings as a voting delegate.
- To address our request for current board and association activities during this past year 3 newsletters were provided by IAMFES staff to all affiliate delegates, past presidents, committee chairs and board members.
- An affiliate member, Doug Marshall, was appointed to the Program Committee and member Paul Nierman was appointed to the Nominating Committee.
- Member Bruhn (CA) questioned why the Wednesday Program Committee was identified as closed. Chair

Person Ruth Fuqua referred to Steve Halstead who reported that on Sunday the Committee has a meeting open for outside participation.

VI. IAMFES Reports

- Michael Doyle, IAMFES President

President Doyle expressed his support of the Affiliate Council and confirmed support by the IAMFES Executive Board, but expressed concerns about expense associated with this support in relation to a "stagnant" membership role. He identified 1550 affiliate members who are IAMFES members, 1340 IAMFES members with no affiliation and 4531 affiliate members with no IAMFES affiliation.

President Doyle gave a positive report on IAMFES financial improvements by citing improved condition since 1989 when the association lost money.

President Doyle reported on the expense/income from the two journals and asked the affiliates that it was necessary to know if the membership wanted or needed the DFES publication. He cited income of \$4.50 US cost of \$3.10 for each JFP and income of \$1.05 US cost \$2.38 for each DFES. These figures did not reflect member dues contribution or reprint fees. Currently 4000 JFP and 3500 DFES journals are printed monthly.

Considerable discussion ensued regarding concern of several affiliate delegates regarding states of the DFES publication areas included comments relating to allocation of advertising, page charges in the JFP for technical articles when technical papers are placed in JFP with no page charge, lack of articles that relate to practical use by the sanitarian and lack of articles that relate to use by regulatory sanitarians.

President Doyle outlined 92-93 IAMFES highlights that included:

- Moved to expanded headquarters in Des Moines, IA.
- Restructuring of Committee.
- Reorganization of JFP management to provide shared editorial responsibilities.
- Start of a strategic long range plan activity.
- Inclusion of the International Life Science Institute in our annual meeting program.

To further expand on committee restructuring he identified these areas:

- Committees: Groups defined in the Bylaws, i.e., nominating, JFP management, etc.
- Professional Development Groups: working groups with long term goals i.e. Applied Laboratory Methods, Dairy Quality and Safety, etc.
- Task Force: issue oriented short term tasks, i.e. long range plan, etc.
- Foundation Fund
- Affiliate Council

President Doyle presented a membership update which indicates over the recent short term, a slight decrease:

1987: 2031 members - 44 student members
1989: 3051 members - 101 student members
1993: 2879 members - 118 student members

President Doyle provided information on the recently completed Lawrence Leiter membership survey. Strategic planning task force met to identify "unknowns", a questionnaire was developed to address these unknown and a telephone survey was conducted in January 1993 to seek response to those issues. The telephone questionnaire included 100 IAMFES only members, 100 IAMFES/Affiliate members and 100 affiliate only members. He summarized survey results in some of the areas that included:

- most IAMFES members joined to obtain one of the journals 58% and 56%
- most renew IAMFES membership to obtain one of the journals
- most subscribe to JFP vs. DFES
- less than 50% identify IAMFES as their primary professional society
- almost half (48%) of IAMFES/affiliate members have attended an annual meeting and only 24% of IAMFES only members have attended an annual meeting

The affiliate member only survey identified these primary "unknowns":

- only 17% were not familiar with IAMFES
- 56% joined our affiliate because they were asked to join
- 57% are government/regulatory employees
- 51% are not members of any national professional organization.

President Doyle then provided these conclusions of the Lawrence Leiter report:

- Pay attention to the journal
- Pay attention to international members
- Develop timely reports on food safety issues
- Public symposia
- Hold regular regional educational workshops
- Provide support to affiliate members.

President Doyle provided some data on the International Life Sciences Institute which included:

- Their objective is to obtain scientific consensus in issues of food safety, nutrition, toxicology and environmental health
- They are composed of 7 worldwide organizations and 5 institutes
- They fund more than 1,000,000 in food safety research annually

Chairman Fuqua expressed the appreciation of the affiliate council for participation of President Doyle and the entire Executive Board. Several delegates comments also expressed individual appreciation.

- Steve Halstead, Executive Manager Report

Mr. Halstead provided information on current procedures used to select sites for annual meetings which included:

- Hotel size, currently more than 600 sleeping rooms are needed and most attendees wish to stay in headquarters hotel
- air transportation
- proximity to local attractions

IAMFES procedures are:

- Board indicates geographical area
- IAMFES staff investigates site and hotel accommodations
- Invitation to local affiliate to host
- Contract with hotel

Some delegates expressed a desire to have more local affiliate input into site selection for reasons that include:

- Better knowledge of local sites
- Proximity to affiliate volunteer worker/committee members
- Cost factors
- Support from affiliate at start makes for better volunteer committee assistance.

Mr. Halstead identified an additional area of increased service to affiliates where IAMFES staff is working to establish a speaker list to help coordinate speaker availability for meetings.

Mr. Bruhn (CA) indicated that he would recommend that IAMFES assist state affiliates in providing technical speakers in a shared cost basis. He also suggested that executive board members could replace staff members to some affiliate meetings. He felt this would be of more cooperative third show support.

- Dee Buske, Affiliate Liaison Report

Ms. Buske presented affiliate notebooks and referenced included materials. She highlighted award deadlines and pointed out affiliate reporting requirements. Ms. Buske emphasized the need for news articles for the DFES journal and pointed out that awards are presented for outstanding articles.

VII. Old Business

Chairperson Fuqua reported that the 1992 affiliate action regarding suggested Bylaw changes had not yet been implemented. Mr. Gabis indicated that a IAMFES Bylaw Revision Committee would be recommending changes when the long range plan has been completed. Secretary Price reported he had been appointed to the By-law Committee and would see that affiliate recommendation are considered.

K. Smith moved to table Bylaw changes until Bylaw Committee can review them. Motion was seconded and passed.

Chairperson Fuqua reported that in 1992 the Affiliate Council had asked to extend affiliation of the Idaho chapter one year pending improving their chapter. IAMFES has notified the chapter of necessary areas where compliance is needed. They do not have minimum members, hold no annual meeting and have no officers. They do have some. After discussion motion by Klee (KY), seconded by Smith (TX) to recommend no action on revocation of Idaho affiliation to IAMFES Board, motion passed.

Chairperson to Fuqua introduced Susan Sumner (NE) the incoming affiliate secretary.

IX. New Business

Chairperson Fuqua announced that a new affiliate, the Metropolitan Association of Dairy, Food and Environmental Sanitarians (MADFES) was approved at this meeting by the Executive Board. She introduced Fred Weber, affiliate delegate. Mr. Weber reported that the association was made up of New York and New Jersey members were associated with the New York Dairy Tech Society.

Chairperson Fuqua discussed the Shogren Award process and identified the New York affiliate as the 1992 winner. She expressed a need for further refinement of the Selection Criteria. The current Shogren scoresheet was distributed and comments solicited for improvement. A committee of affiliate members was appointed to review and make recommendations as follows:

Charles Price (IL) Chairman
Donna Izac (VA)
Terry Musson (NY)
Susan Sumner (NE)
John Bruhn (CA)
Krista Mountjoy (ON)
Peter Hibbard (FL)
Robert Taylor (MI)

The committee will meet at noon on Monday, August 2, to work on a report. Other members were invited to participate.

During further discussion on the Shogren award issue, it was suggested by several delegates that the council should consider other awards and recognition such as best newsletter, best annual meeting, best educational conference, etc.

Each affiliate was asked to give a brief report with emphasis on strengths:

TN - Strong core/base of membership provides results.

IL - Increased membership, now at 354 members, educational workshops, and newsletter.

We have 28 associate supporting members and have established an honorary lifetime program.

This year 5 one-day workshops and 2 affiliate day long conferences are held. 50th year affiliation.

MN - Strong membership exceeds 300. Excellent participation in spring and fall conferences. Strong core of management.

CA - Strong educational programs in spring and fall plus several regional workshops.

AL - Significant membership concerns some 1988 charter. Two educational conferences per year.

WY - Strength is in weakness. Geographical spread of members resulted in several training sessions in 20 areas that reached over 800 people.

CAROLINAS - Had 1st annual meeting in May. Has 61 members. Had 1/2 day technical program.

NE - Technical educational efforts reach industry, government and academia. One annual meeting.

IA - Dairy background. Has 2 yearly meetings. 113 members

WI - Joint Educational Conference this fall to celebrate 50th year of affiliation. Has quarterly newsletter and 350 members.

IN - Has stayed decline in members but most members not affiliated with IAMFES. Future programs will be broadened to appeal to food and dairy.

VA - Some decline in membership, are very oriented and have begun dialog with processors to increase membership.

MI - Celebrating 50th year of affiliation. Annual educational meeting will be held with National Sanitation Foundation in Ann Arbor. Major membership is in Public Health Area.

MET - Originated in 1936 as Dairy Tech group. New affiliate. Had been affiliate of New York will seek to enlarge membership in other areas of public health.

ALBERTA - Has 3 technical meetings per year and joint meeting with Alberta Food Science Association. Strong organizations.

NY - 14 affiliates in membership. Estimated 75 educational workshops. Paid staff and newsletter editor. Has 3 day annual meeting.

MS - Has 110 members, mostly in health area. Is extending into other areas.

ND - Strong annual meeting. Mostly state and local health department members. Played major role in reinstatement of food and lodging program in health department this year.

KS - Traditional dairy and food based has evolved to 70% environmental. Has scholarship program, newsletter and about 200 members.

OH - Columbus, Ohio area based. Two educational conferences per year. Experienced a problem this year with lack of support by health department.

TX - 327 members with large attendance at annual meeting. Has developed milk pasteurization training course. Provides 2 scholarships and hosts a golf tournament. Will host 1994 meeting in San Antonio.

GA - Young affiliate. Has program in meat and poultry area. Has joint conference with dairy tech group. Has newsletter.

ONTARIO - Fall food safety (pathogens) conference and spring workshop that included several areas of public health. This fall will host "Total Quality Confusion" which will delineate difference in TQM and ISO 8000.

KY - Strong membership and annual meeting. Is dairy based. Had leadership role in establishing a registered sanitarian law in state - provides scholarship.

FL - Annual 2 day spring conference on food safety issues. Scholarships and includes exhibitors at meeting.

WA - Recently moved to annual state meetings instead of sectional areas. Hires professional help for meeting arrangements scholarships.

PA - Will host 1995 annual meeting at Hilton in Pittsburgh. Has strong annual meeting. Previously dairy in scope but is expanding.

Respectfully submitted,

Charles D. Price, Secretary

Foundation Fund Report

Committee Members Present: Robert Marshall, Earl Wright, Dee Clingman, Executive Board

Participants: Richard Brazis, Michael Doyle, Ann Draughon, Steven Halstead, Executive Manager, Ron Schmidt, David Tharp, IAMFES Office

Submitted by: Harry Haverland, Chairman

Summary:

Steve Halstead introduced David Tharp as the recently hired accountant for the office. We were pleased to have Dave present and for his participation in the discussions. Last year's minutes were reviewed and comments made regarding the budget and the amount of monies spent and the balance. It was clarified that the budget is a working document and if the allocated funds are not used they remain in the Foundation Fund.

Considerable discussion centered around the 1993-94 projected expenditures and income. To avoid the eroding away of the Foundation Fund base, the committee agreed that it is necessary to keep the expenditures within the scope of the current income. Declining interest rates have impacted on the available monies for projects. Although a worthy project, for effectively utilizing surplus journals was accepted, financial restraints prevented implementation. It was noted that there is a possibility of finding funding for this project through other sources. The following budget was agreed upon:

EXPENDITURES

Ivan Parkin Lectureship	\$1,800.00
Loaning Library	\$4,000.00
Developing Scientists Awards	\$2,200.00
Student Memberships	
Banquet Tickets	
DFES Awards	\$ 750.00
Travel Supplement for Speakers	\$4,000.00

TOTAL \$12,750.00

INCOME:

Sustaining Members	\$9,750.00
Interest	\$3,000.00

TOTAL \$12,750.00

The proposed By-Laws for the Foundation Fund, as prepared by the IAMFES legal advisor were discussed. A motion was made by Earl Wright and seconded by Bob Marshall to accept the International Association of Milk, Food and Environmental Sanitarians, Inc., Foundation By-Laws. Motion passed.

Recommendations to the Executive Board:

1. The Executive Board direct the Central Office to seek a higher rate of interest for the Foundation Fund's monies with minimum risk.
2. The Executive Board direct the Executive Manager to advise Sustaining Members of the activities funded by the Foundation Fund. This information could accompany renewal notices going to Sustaining Members.

3. The Executive Board proceed with the Adoption of the International Association of Milk, Food and Environmental Sanitarians, Inc. Foundation By-Laws.
4. The Executive Board express the Foundation Fund Committee's appreciation to the Central Office Staff for the professional manner in which they carry out the many activities associated with the Foundation Fund.

IAMFES Financial Status
September 1, 1992 to August 31, 1993

Cash on Hand - September 1, 1992 214,347

Cash Flow from Operations:

Revenue:		
Advertising	118,158	13.6%
Membership	218,625	25.2%
Communication	333,657	38.5%
Administrative	18,469	2.1%
Annual Meeting	150,349	17.3%
Workshops	14,025	1.6%
Foundation Fund	11,697	1.3%
Feagan Award Fund	3,504	0.4%
Restricted Fund	107	0.0%
Total Revenue	868,591	100.0%

Expense:

Salaries & Benefits	302,638	33.6%
Building Operations	39,298	4.4%
Office Operations	90,001	10.0%
Professional Services	48,863	5.4%
Publications	218,815	24.3%
Travel	22,527	2.5%
Executive Board	7,112	0.8%
General Committee	23,542	2.6%
Miscellaneous	8,534	0.9%
Annual Meeting	120,500	13.4%
Workshops	5,248	0.6%
Foundation Fund	10,463	1.2%
Feagan Award Fund	2,702	0.3%
Restricted Funds	10	0.0%
Total Expense	900,253	100.0%

Revenue Less Expense Before
Cummulative Effect of Change
In Accounting Principle (31,662)

Cummulative Effect of Change
In Accounting Principle 5,258

Revenue Less Expense (26,404)

Change In:
Asset/Liability Accounts (8,802)

Net Cash Flows from Operations (35,206)

Equipment Purchases (12,983)

Cash on Hand - August 31, 1993 166,158

IAMFES Awards Presented . . .

Ivan Parkin Lectureship



IAMFES President-Elect, Michael Doyle (r) presenting the Ivan Parkin Plaque to Mr. Morris E. Potter (l).

. . . was presented by **Morris E. Potter**, Assistant Director for Bacterial and Mycotic Diseases at the Centers for Disease Control and Prevention, Atlanta, GA. Mr. Potter's lecture was "The Challenges of Epidemiology in Food Protection" and set the theme for the 80th IAMFES Annual Meeting.

The Ivan Parkin Lecture is sponsored by the IAMFES Foundation Fund and is supported by the Sustaining Members.

Samuel J. Crumbine Consumer Protection Award

**Allegheny County,
Pennsylvania Health Department**

The Samuel J. Crumbine Award spotlights the importance of food protection at the local level. Each year, this award is given to a local health department that has demonstrated unsurpassed achievement in providing outstanding food protection services to its community. It provides recognition for the contributions to public health and food safety that the unsung work of restaurant and food store inspection make.

The award, which honors Dr. Samuel J. Crumbine, a pioneer in disease prevention techniques who banned the common drinking cup, is sponsored by the Foodservice and Packaging Institute. An independent panel of health professionals who are experts in the field of food safety selects the winner.

The 1993 Samuel J. Crumbine Award is awarded to the Allegheny County, Pennsylvania Health Department. The department was selected for having the best food protection program in the country. The Allegheny County unit was cited for being highly creative and very responsive to community needs, especially in its risk based evaluation of chain restaurants and ethnic food establishments. High praise was also given for the sophistication of the county's training programs, both for inspection staff and food service managers, as well as the innovative ways in which it achieved its objectives for the improvement of food safety.

The Allegheny County Health Department is represented by Michael Diskin, Environmental Health Administrator II, who will accept the Crumbine medallion on behalf of Glenda M. Christy, Chief of the Food Protection Section.

Sherman Award

***Escherichia coli* O157:H7:
Epidemiology, Pathogenesis, and
Methods for Detection in Food**

published in the *Journal of Food Protection*, July, 1992

Nisha V. Padhye
Food Research Institute,
University of Wisconsin-Madison,
Madison, Wisconsin, and

Michael P. Doyle
Food Safety and Quality Enhancement Laboratory,
Georgia Experiment Station,
University of Georgia,
Griffin, Georgia



Michael Doyle accepts the Sherman Award from John Marcello of the Educational Foundation of the National Restaurant Association.

The Sherman Award, sponsored by the Educational Foundation of the National Restaurant Association, recognizes outstanding articles on foodservice food protection appearing in the *Journal of Food Protection and Dairy, Food and Environmental Sanitation*. The award honors Norbert F. Sherman, the late treasurer of the Educational Foundation and an advocate of improved industry food protection standards. The 1993 Sherman Award is given for the article, "*Escherichia coli* O157:H7: Epidemiology, Pathogenesis, and Methods for Detection in Food."

Dr. Nisha Padhye finished her B.S. and M.S. with honors in organic chemistry from University of Bombay, India. She joined the graduate school at the University of Wisconsin-Madison in the fall of 1987. She began her research work on development of a rapid and sensitive immunodiagnostic test for the detection of enterohemorrhagic *Escherichia coli* O157:H7 in foods at the Food Research Institute at the University of Wisconsin under the guidance of Professor Michael Doyle. Nisha finished her Ph.D. in four years and her Ph.D. research has resulted in a patent application. The technology she developed for rapid and sensitive detection of *E. coli* O157:H7 in foods has been commercialized by a major food diagnostic company.

After completing her Ph.D., Nisha joined the Centers for Disease Control, Hepatitis Virus branch as a Visiting Scientist and worked on developing an immunoassay for the detection of viral pathogens. Currently she is a scientist at OPHIDIAN Pharmaceuticals, Inc., a Madison based company and is involved in the development of new and improved antidotes for various biologic poisons and food poisoning, and products for preventing and treating infectious diseases.

Dr. Doyle, current IAMFES President, moved from the University of Wisconsin's Food Research Institute to the University of Georgia Experiment Station in early 1991. He has published well over 100 scientific papers and given a similar number of presentations to national and international meetings.

Dr. Doyle accepted this award. The authors received a plaque and \$500.

Dairy, Food and Environmental Sanitation Outstanding Article Awards

The IAMFES Foundation awarded certificates and \$250 to authors with outstanding articles in *Dairy, Food and Environmental Sanitation* during 1992. This year's winners were:

Dairy Article: "Nutrient Composition to Eight California Milk Products Based on Analysis Conducted in 1990-91" by William Green, Leon Jensen and Ken Park, California Department of Food and Agriculture, Sacramento, CA.

Food Article: "Residue Concerns in Seafoods" by Robert J. Price, University of California-Davis, Davis, CA.

Environmental Article: "Preparing for a Disaster Before and After - An Action Plan for Food Operations" by C. Dee Clingman, General Mills Restaurants, Inc., Orlando, FL.

3-A Symbol Council Appreciation Award



Mr. Warren Clark (r) presenting the 3-A Symbol Council Appreciation Award to Mr. Henry Atherton (l).

Affiliate Charter



Fred Weber accepting of the Affiliate Charter for the Metropolitan Association of Dairy, Food and Environmental Specialists

The Metropolitan Association of Dairy, Food and Environmental Specialists was adopted into the IAMFES family at the Awards Banquet Wednesday evening. The group, previously known as the Metropolitan Dairy Technology Society, was founded in 1936. The core membership for the Metropolitan Association of Dairy, Food and Environmental Specialists is from New Jersey and New York. Fred Weber accepted the charter for the newest Affiliate.

Certificate of Merit Award

... is presented to those affiliate members who are active within their state/province affiliate group and IAMFES. This year the award was presented by Terry Musson to **John Bartell**, Alfred State College, Alfred, NY.

Membership Achievement Award

... is presented to the IAMFES Affiliate which has had the most new members in the past year. This year's winner is the California Association of Dairy and Milk Sanitarians.



Nancy Scholl of the California Department of Food and Agriculture accepts the Membership Achievement Award from Affiliate Council Chairperson Ruth Fuqua.

Shogren Award

... is presented to an Affiliate of IAMFES for service to its members in the past year. This year the New York State Association of Milk and Food Sanitarians received a certificate and \$100 check for their services and contributions.

Developing Scientist Awards

... were presented to five students, judged on their paper and presentation at the IAMFES Annual Meeting. These awards are sponsored by the IAMFES Foundation Fund. First place went to **Randall K. Phebus** of Kansas State University, Manhattan, KS. Randall received \$500 and a plaque for "Determination of Cytosolic Aflatoxin B₁-Degradation Activity of *Flavobacterium Aurantiacum*" **J. Eric Line** of University of Georgia, Griffin, Georgia won second place with \$200 and a certificate for his presentation

Developing Scientist Awards



The Developing Scientist Award Winners are (l to r): Tom Yezzi, Fifth Place; Lee-Ann Jaykus, Fourth Place; David H. Toop, Third Place; J. Eric Line, Second Place; Randall K. Phebus, First Place.

"Influence of Aflatoxin and Nutrient Concentration on the Degradative Ability of *Flavobacterium Aurantiacum*." Third place received \$100 and a certificate for "Use of the Pig as a Model to Study Colonization of the Gastrointestinal Tract by Bifidobacteria and *Lactobacillus Acidophilus*" and went to **David H. Toop** of the University of Guelph, Guelph, Ontario, Canada. The winner of fourth place was **Lee-Ann Jaykus** of University of North Carolina, Chapel Hill, NC. She won \$50 and a certificate for "Analysis of *Listeria* Risk Management for Food Processors." Fifth place went to **Tom Yezzi** of the University of Minnesota, St. Paul, MN. He received \$50 and a certificate also. His presentation was titled "Inhibition of Gram-Positive Pathogens in Cold-Pack Cheese made from Cheese containing Nisin."



Nahed Ahmed, The Developing Scientist Poster Competition Winner, receives her plaque from Anna Lammerding.

The Developing Scientist Poster Competition was a new addition to our awards. This year's winner, **Nahed Ahmed**, from Auburn University, Auburn, Alabama, received \$300 and a plaque for her poster presentation "Evaluation of Different Media for Recovery of Thermally-Injured *Escherichia coli* O157:H7."

Harold Barnum Industry Award

David D. Fry
Dairy Technical Services Representative
Bunge Foods Corporation
Atlanta, Georgia



David Fry receives the Harold Barnum Industry Award from IAMFES President-Elect C. Dee Clingman (far right) and Tom Valitchka of Nasco International.

The Harold Barnum Industry Award, sponsored by NASCO International of Fort Atkinson, Wisconsin, is given in recognition of outstanding service to the public, IAMFES and the profession of the Sanitarian. The 1993 Industry Award is presented to David D. Fry of Lilburn, Georgia.

Mr. Fry began his career of service to the dairy industry in 1948. While attending classes, he worked full and part time at the Purdue University Creamery, leaving the position of Creamery Manager in 1954. He then began a long stint of service with T.G. Lee Foods, McArthur Dairy and Dean Foods Co., in Orlando, Florida. As Quality Control Floor Supervisor and Assistant to the Vice-President of Production, Mr. Fry was responsible for maintaining the highest quality in a variety of dairy products. In 1978 he also became Construction Superintendent and Production Manager for the Orange City, Florida based Life Style Cultured Plant. He became General Superintendent for Borden Dairy in Orlando in 1982. During his four years there, he improved product quality, increased volume and added two additional code days to shelf life. Mr. Fry assumed his current position of Technical Service Representative for Bunge Foods, Atlanta in 1986.

In addition to his outstanding career service, Mr. Fry has been actively involved in over a dozen professional groups including the Georgia and North Carolina Dairy Technical Societies, the Georgia, North Carolina, Virginia and Florida Dairy Products Associations, the Southern Association of Dairy Food Manufacturers, and the Interstate Milk Shippers.

He has contributed to the dairy industry in a number of other ways: as a 3-A Symbol Council Trustee since 1982; as a member of the Dean of Agriculture Advisory Committee at the University of Florida; and as a judge in the Collegiate Dairy Products Evaluation Contest for over 10 years.

A member of the International Association of Milk, Food and Environmental Sanitarians since 1954, Mr. Fry served as President in 1978. He is also a 39 year member and Past President of the Florida Association of Milk, Food and Environmental Sanitarians and a founding member of the Georgia Association of Food and Environmental Sanitarians. For IAMFES, Mr. Fry served on the Executive Board for seven years and the Annual Meeting Convention Committees in St. Petersburg, Miami, Orlando and Atlanta - twice serving as chairman.

Mr. Fry and his wife Iris have three children and four grand-children.

Educator Award

Irving John Pflug, Ph.D.
Professor of Food Science and Nutrition
University of Minnesota
Minneapolis, Minnesota



Irving Pflug accepts the Educator Award, with IBA, Inc. representative Henry Atherton in the background.

The Educator Award, sponsored by IBA, Inc. of Millbury, Massachusetts, honors outstanding service in academic contributions to the profession of the Sanitarian. The 1993 Educator Award winner is Irving John Pflug, Ph.D.

From his beginnings at the University of Massachusetts in 1953, Dr. Pflug has contributed to the practical aspects of food processing and preservation. One key to his work is that he maintains a balance between the academic and industry "worlds", and between microbiology and engineering. He not only develops new technical methods to solve thermal preservation problems, but they are practical and explained in a manner that enables the food industry to easily use them to improve food processes.

Dr. Pflug is currently a Professor of Food Processing-Food Preservation at the University of Minnesota. He teaches and supervises graduate students and directs the Environmental Sterilization Laboratory. In addition, he is a consultant in preservation to both industry and the government, is a researcher in areas dealing with heat transfer and sterilization, and teaches thermobacteriology and thermal processing. In the food processing and thermal engineering graduate degree program, he has mentored some of its finest students and has taught thousands in the food industry world wide to understand thermal food processing technology. Because of his teaching, there is no question that thermally processed food in the United States and the world is much safer today.

He has also held positions at Michigan State University and the University of Massachusetts, been a principal investigator for the NASA Planetary Quarantine research project and has worked on a special research project on food preservation in flexible packages at the Continental Can Company.

His education includes Ph.D. and M.S. degrees in Food Science from the University of Massachusetts, a Civil Engineering Certificate from Ohio State University, and from Purdue University, a BSA in General Agriculture and a BSAE in Agricultural Engineering.

Two special aspects of Dr. Pflug which make him uniquely distinguished are his honesty and dedication to high ethical standards and practices. He not only maintains high ethical standards, which have earned him the respect of his peers internationally, but is also kind and generous, and always has time to talk to students in order to help them succeed. He epitomizes the very best of what a teacher/educator should be.

Sanitarian Award

Lawrence Roth

Supervisor of Food Microbiology
Alberta Agriculture
Edmonton, Alberta, Canada



Lawrence Roth receives the Sanitarian Award from Dick Bakka, representing Klenzade Div., Ecolab, Inc.

The Sanitarian Award is sponsored by Diversey Corporation, Livonia, Michigan; Klenzade Division of Ecolab, Inc., St. Paul, Minnesota; and H.B. Fuller Company, Monarch Division, Minneapolis, Minnesota. These three companies join together to honor an individual for outstanding service to the profession of the Sanitarian. The 1993 Sanitarian Award winner is Lawrence Roth.

Mr. Roth received his Bachelor of Science in Dairy and Food Science from the University of Alberta in 1967. In 1969 he completed a Masters of Science in Food Microbiology from the same institution.

Mr. Roth has since developed a long distinguished career in dairy and food microbiology. While with the National Research Council, Ottawa, Canada, he performed research on microflora of meats and anaerobic digestion of food plant wastes. While at General Foods Ltd. of Cobourg, Ontario, he conducted research on sterilization of foods by ethylene oxide.

Mr. Roth has been a strong supporter of the IAMFES and has held membership in the International since 1978. He has been in attendance at all annual meetings since 1981 and has served on numerous committees of the International.

Currently Mr. Roth is employed by Alberta Agriculture Department of Food and Rural Development. There, he supervises the laboratory testing of food products and serves as technical resource for the food and beverage industry. Mr. Roth is a resource expert in HACCP development for the Alberta Food Industry and serves on the Board of Directors of the Association of Official Analytical Chemists Research Institute. In addition, he is Chairman of the Antibiotic Residue Methods Committee for the Canadian National Liaison Group on Milk Quality and is a member of the International Dairy Federation Commission E47 on antibiotics.

Because of his concern for the health and welfare of the population he serves, as well as his commitment to service for the industries he regulates, he is highly respected by both. As a dynamic crusader for the ideals of IAMFES, Mr. Roth brings to life the spirit of his year's theme of "Meeting the Challenge of Applying Science for: Industry—Regulatory—Academia and Consumers."

Citation Award

Robert C. Tiffin

National Quality Assurance Manager
J. M. Schneider, Inc.
Kitchener, Ontario, Canada

The Citation Award is presented by the International Association of Milk, Food and Environmental Sanitarians for many years of devotion to the ideals and objectives of the Association. The 1993 Citation Award winner is Robert (Bob) C. Tiffin, B.S.A., R.M.

Mr. Tiffin is the National Quality Assurance Manager at J.M. Schneider, Inc., a position he has held for several years. He obtained his BSA degree in Science with a major in Microbiology from the University of Guelph in 1967, and has taken many specialized courses in subsequent years.



Michael Brodsky (r) presenting the Citation Award to Robert C. Tiffin (l).

His responsibility at J.M. Schneider is focused on Quality Assurance, Sanitation, the Environment, Edible and Inedible Rendering and Continuous Improvement, through which he has contributed greatly to the success of the organization. Under Mr. Tiffin's direction, programs in Quality Assurance, Environment, and Sanitation have been developed which have helped to make J.M. Schneider a leader in the food processing industry.

Mr. Tiffin has contributed to the meat industry over the years through his many involvements in government, industry and academia. Some of his involvements include: Chairman of the Ontario Food Protection Association, 1990; Member of the Expert Committee on Meat and Poultry Products, 1988-1993; Chairman of the Canadian Institute of Food Science and Technology, Guelph Sector, 1978; Honorary Life Member of the Ontario Food Protection Association; Sanitarian of the Year award from OFPA, 1982.

He belongs to many professional associations that support the goals of the meat industry and is a registered microbiologist in agriculture, industrial, environmental and food/dairy sanitation microbiology with the Canadian College of Microbiology.

Mr. Tiffin played key roles in the development of programs with the Canada Department of Agriculture and in developing and instituting HACCP (MSEP) programs in the meat industry. Among his other achievements are the organization of and participation in many technical meetings, symposia and conferences with government, industry and academia.

Past President's Award

Presented to
Michael P. Doyle
IAMFES President
1992-1993



Michael Doyle receives the Past President's Award from incoming IAMFES President Harold Begsch.

1993 IAMFES Annual Meeting Exhibitors

The following are descriptions of the companies and displays from the 1993 IAMFES Annual Meeting in Atlanta, Georgia. If you would like information from these exhibitors, please contact them and they would be happy to answer your questions or provide additional information.

ABC Research Corporation

Gainesville, FL Sustaining Member

Chemistry, Microbiology, Product Development, Government Certified Industry Recognized, Nutritional Labeling, Residues, Pesticides, Environmental - Water and Wastewater, Application Research, Taste Panel, Custom Cultures, ELISA - Species - Plant Sanitation, Audits, HACCP Programs, Food Poisoning - *E. coli* O157, *Listeria*, *Salmonella*, Other Pathogens, Spoilage Problems, Shelf-life, Inoculated Pack, Expert Witness, Consulting.

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

Accurate Metering Systems

Schaumburg, IL Sustaining Member

A complete family of sanitary flowmeters (mass, positive displacement, electromagnetic, and turbine). Also, on display were batching controllers, presets and totalizers. Information was available for certified raw milk metering systems for farm tank trucks and receiving bays.

Phone: 708-882-0690
FAX: 708-882-2695

Advanced Instruments, Inc.

Norwood, MA

Advanced Instruments displayed cryoscopes for detection of added water in milk, and the Fluorophos® ALP Test, a three-minute quantitative alkaline phosphatase assay that detects as little as 0.0006% raw milk contamination in finished dairy products.

Phone: 617-320-9000
FAX: 617-320-8181

Ampco Pumps Company, LP

Milwaukee, WI Sustaining Member

Ampco "D" Series centrifugal pumps designed solely for pump cleaning and/or sanitizing solutions in conformance with provisions of the proposed "Revised 3A Accepted Practices...Processing Plants" - Number 605-04 were displayed. Literature concerning other models was also available.

Phone: 414-643-1852
FAX: 414-643-4452

Anderson Instrument Co., Inc.

Fultonville, NY Sustaining Member

Anderson Instrument Co., Inc., designs and manufactures a complete line of process monitoring and control devices for the Food and Dairy Industry. This year they highlighted the DART, digital reference thermometer; the first legal, failsafe alternative to mercury-in-glass thermometers for HTST processing.

Phone: 518-922-5315
FAX: 518-922-8997

Aquionics, Inc.

Erlanger, KY

High intensity ultraviolet systems for disinfection of fluids, air and surfaces are showcased. Units for both potable and high solids fluids suitable for treatment of incoming plant waters, make-up/dilution waters, brines, transport/cooling waters were displayed. Air systems for disinfection of positive air flows were also on display. Newly designed systems for surface and packaging disinfection, and reduced cost chambers for high solids fluid applications are now available.

Phone: 606-341-0710, 800-925-0440
FAX: 606-341-2302

Atkins Technical Inc.

Gainesville, FL

Digital Temperature Recorders, Digital Clipboard Thermometers, high accuracy, water resistant thermometers. More than 150 probe designs for food and equipment temperatures. Digital Panel Thermometers. Digital Thermometers for food temperatures.

Phone: 904-378-5555
FAX: 904-335-6736

Becton Dickinson Microbiology Systems

Cockeysville, MD Sustaining Member

Becton Dickinson Microbiology Systems exhibited products utilized for the cultivation and identification of foodborne pathogens, including *Salmonella* and *Listeria*. In addition, the company displayed autoclave controls and a complete line of bottled media utilized in sterility testing, environmental monitoring and recovery of foodborne pathogens as well as an innovative new identification system recently introduced.

Phone: 410-771-0100
FAX: 410-584-2806

Bentley Instruments, Inc.

Chaska, MN Sustaining Member

The Bentley Somacount 300 somatic milk cell counter. Available both as a semi-automatic and as an automatic instrument. A laser based instrument employing state of the art technology. Also the Bentley 2000 infrared analyzer for fat, protein, lactose, and solids determination in milk. Both instruments are controlled by a personal computer.

Phone: 612-448-7600
FAX: 612-368-3355

BioControl Systems, Inc.

Bothell, WA

BioControl is a recognized leader worldwide in rapid microbiological diagnostic kits. Our products are accurate, innovative, simple and cost-effective. They include 1-2 Test® for *Salmonella*, Assurance® *Salmonella* EIA, Assurance® *Listeria* EIA, ColiTrak® ColiTrak Plus®, and ColiComplete® substrate supporting discs for the one-step, one disc confirmed testing of coliforms and *E. coli*. Innovative products, Technical Support, and Personalized Service: The "BioControl Difference": that we are committed to offer every customer every day.

Phone: 206-487-2055, 800-245-0113
FAX: 206-487-1476

bioMérieux Vitek, Inc.

Hazelwood, MO Sustaining Member

bioMérieux Vitek, Inc. is committed to providing the food industry with fully-automated, semi-automated, and manual test systems for the QA/QC microbiology laboratory. VIDAS and mini VIDAS are fully automated immunoassay systems used for rapidly screening pathogens such as *Salmonella*, *Listeria*, and Staphylococcal enterotoxin. The Bactometer is available for the detection and enumeration of microorganisms in hours instead of days. For the identification of microorganisms, the VITEK system, ATB Identification System, or API test strips provide rapid results typically in 4 - 24 hours.

Phone: 314-731-8504
FAX: 314-731-8700

Biotrace, Inc.

Plainsboro, NJ

Responding to the growing demand for rapid microbial sanitation and product testing, Biotrace introduced its new state-of-the-art Multi-Lite system, the most sensitive portable luminometer in the

world, and Auto-Lite an automated system for high volume sterility tests of UHT products. These systems set new standards in sensitivity which are especially important for rapid microbial testing of line hygiene, CIP rinses, beer and soft drinks, and raw milk.

Phone: 609-897-0282
FAX: 609-897-0289

Capitol Vial, Inc.

Fultonville, NY Sustaining Member

In this day of rigorous laboratory testing and vigorous regulatory activity, even a single adulterated sample can have devastating economic effect. Only an absolutely leakproof, airtight and sterile sample container with an attached cap can guarantee sample integrity. Only one company can fully guarantee that its vials are: Leakproof, Airtight, Sterile. They also displayed New Spouts for milk and orange juice gable-top containers.

Phone: 800-836-5520
FAX: 518-853-3409

Cargill Analytical Services

Cedar Rapids, IA

Analytical laboratories testing food and feed through chemical and microbiological analysis. Services include Nutritional Labeling, Quality Control, Technical Services, and Production Testing, all provided with a commitment to the principles of the Total Quality Process.

Phone: 319-366-3570
FAX: 319-366-4018

Charm Sciences Inc.

Malden, MA Sustaining Member

Charm Technology continues to define quality assurance and quality control with rapid tests for residue detection (Antibiotics, Aflatoxins, Pesticides), total viable count, shelf life prediction, sanitation surveillance, and pasteurization control. In addition, Charm Sciences offers custom designed software for on line data management.

Phone: 617-322-1523
FAX: 617-322-3141

Copan Italia SpA

Bovezzo-Brescia, Italy

Manufacturers of Diagnostic Products for Microbiology use. Copan Italia presented a new system for the detection of Environmental *Listeria* and *Salmonella* which will fit in their range of products for the Sanitation Field. Tests for food quality control were also exhibited.

Phone: 0039-30-2712763
FAX: 0039-30-2713196

Copesan Services, Inc.

Brookfield, WI

Copesan Services is a nationwide pest management company with more than 600 service locations throughout the United States, Canada, Mexico

and the Caribbean. We provide quality insect, rodent, bird, and weed control, fumigations, and sanitation inspections. Copesan specializes in regional, national and international commercial clients.

Phone: 800-558-2303, 414-783-6261
FAX: 414-783-6267

Custom Control Products, Inc.

Racine, WI Sustaining Member

CCPI designs automation controls for the Food & Dairy Process Industry. All controls follow, meet or exceed the regulations and guidelines set for dairy processing. On display were the HTST Process Controls Package using the latest PLC Processor and Electronic Instrumentation including the Dart, Vitamins A & D Injection System, Screen Controls and Report Generation Package for CIP and Vitamins, etc.

Phone: 414-637-9225
FAX: 414-637-5728

DQCI Services, Inc.

St. Paul, MN Sustaining Member

DQCI Services assembles component samples for the calibration and standardization of infra-red equipment. Samples range in butterfat content of .10% to 50% butterfat with varying protein, lactose, and solids content. Milk samples are also developed with known somatic cell count levels for the calibration and control of electronic somatic cell counters. Chemical and bacteriological testing of milk and milk products is also conducted at DQCI Services.

Phone: 612-785-0484
FAX: 612-785-0584

Dairy & Food Labs, Inc.

Modesto, CA

Dairy & Food Labs, Inc. (DFL), established in 1925, provides the Dairy Industry with Microbiological Services: *Salmonella*, *Listeria*, *E. Coli*, and other "food safety" pathogens, spoilage organisms, shelf life testing. Complete Chemistry Chromatography Services: Nutritional Analyses, Protein, Fat. Consultation Services: HACCP and QC Programs.

Phone: 209-521-5503, 510-830-0350
FAX: 209-521-1005

Decagon Devices

Pullman, WA Sustaining Member

At the 1993 IAMFES annual meeting, Decagon Devices featured the AquaLab model CX-2. The AquaLab is extremely fast and precise, making a_w measurements in 2.5 to 5 minutes with $\pm 0.003 a_w$ accuracy. For users needing temperature control, they now offer the new CX-2T which uses an external water bath.

Phone: 509-332-2756
FAX: 509-332-5158

Difco Laboratories

Detroit, MI Sustaining Member

Difco Laboratories is a Worldwide manufacturer of quality Microbiology products. The product lines include dehydrated media and ingredients, which have been developed for a variety of industries, such as Food and Beverage, Dairy, Pharmaceutical, Cosmetic, Water and Waste Water, Biotechnology, and Clinical Laboratories. Difco also offers Immunology and Serological products for detection of microorganisms, Prepared Culture Media, QC cultures, Stains, Reagents and Indicators.

Phone: 800-521-0851

Ecolab Pest Elimination Services

St. Paul, MN Sustaining Member

Complete Pest Elimination Services. All aspects of pest elimination including Cockroaches, Rodents, Flying Insects, and Stored Product Pests.

Phone: 800-325-1671
FAX: 612-225-3088

Electro-Steam Generator Corporation

Alexandria, VA

Electro-Steam manufactures generators/cleaners that provide convenient steam for cleaning. The generators have no flame, fumes, flues, or flooding. Environmentally safe. Can be built to your specifications. Units are built in accordance with the highest possible approvals - ASME, National Board of PVI Shop Inspection, UL, CSA, ETL.

Phone: 800-634-8177, 703-549-0664
FAX: 703-836-2581

ENVIRONETICS, Inc.

Branford, CT

ENVIRONETICS, Inc. features Colilert® the EPA approved breakthrough in coliform testing. Colilert simultaneously detects, identifies, and confirms total coliforms and *E. coli* in the same container, in 24 hours or less. AOAC approved for water used with foods

Phone: 203-481-3073, 800-321-0207
FAX: 203-481-6358

Charles Felix Associates

Leesburg, VA

Charles Felix Associates is a consulting firm specializing in public health promotion, particularly in the area of food safety. The CFA exhibit offered samples of CFA publications: *Food Protection Report* and *Food Talk*; also materials from CFA clients relating to Single Service (The Foodservice & Packaging Institute) and Ice Sanitation (The Packaged Ice Association).

Phone: 703-777-7448
FAX: 703-777-4453

Foss Food Technology Corp.

Eden Prairie, MN Sustaining Member

Foss Food Technology provides high quality analytical instrumentation for QC, Production, and Online Process Control, consumables, and diagnostic kits to the Dairy, Food, Feed and Beverage industries. Through our 6 sales locations throughout North America, FFTC provides the instruments that automatically analyze Fat, Protein, Lactose, Somatic Cells and Bacteria counts in milk and milk products; Determine Protein in food, feed, grain, and meat; and Determine Moisture in cereals.

Phone: 612-941-8870
FAX: 612-941-6533

Gardex Chemicals, Inc.

Etobicoke, ON, Canada Sustaining Member

Gardex Chemicals Inc., Canada's leading supplier to the professional structural pest control industry for more than 30 years, is now distributing in the United States of America. Gardex places a high priority on selecting and securing the latest and best technologies that exist, has extensive technical and field experience, as well as having national coverage.

Phone: 800-563-4273
FAX: 416-675-6727

GENE-TRAK Systems

Framingham, MA Sustaining Member

GENE-TRAK Systems is offering a complete line of rapid, easy-to-use tests for the detection of food pathogens. The Colorimetric GENE-TRAK Assays will allow the user to test food samples easily and quickly for the presence of *Salmonella*, *Listeria*, *Listeria monocytogenes*, *E. coli*, and *Staph aureus*. Also exhibited was the complete line of E. Merck granulated microbiological culture media and Hygicult Agar Slides from Orion Diagnostics for monitoring microbiological hygiene.

Phone: 800-338-8725
FAX: 508-879-6462

Gist-brocades Food Ingredients, Inc.

King of Prussia, PA Sustaining Member

Gist-brocades Dairy Ingredients Group demonstrated its new Delvo X-PRESS 8 minute test for detection of antibiotics in bulk milk, as well as displaying Delvotest@P/SP standard diffusion tests for determining the presence of antibiotic residues in individual cow samples.

Phone: 215-272-4040, 800-662-4478
FAX: 215-272-5695

Idetek, Inc.

Sunnyvale, CA

Idetek provides innovative, rapid and highly reliable Food Safety and Quality Assurance testing systems to Food Producers, Processors, Researchers, Regulators and Veterinary Laboratories world-

wide. The LACTEK™ family of test kits allows for rapid detection of animal drug residues and other contaminants in Milk. The simple procedure enables users to test for the presence of residues in only 7 minutes, and includes tests for Beta Lactams, Cepitofur and Tetracyclines in Raw Milk and finished Dairy Products.

Phone: 408-745-0544, 800-433-8351
FAX: 408-745-0243

IDEXX Laboratories, Inc.

Westbrook, ME Sustaining Member

IDEXX Laboratories develops and commercializes advanced biotechnology-based detection systems for quality assurance applications. The Food and Environmental Division of IDEXX specifically provides antibiotic residue screening tests, *E. coli* and total coliform assays for water quality, and rapid microbiological detection systems for Dairy and Food Industry HACCP applications.

Phone: 800-548-6733
FAX: 207-856-0346

Integrated BioSolutions, Inc.

Monmouth Junction, NJ

MOVING MICROBIOLOGY INTO THE 21ST CENTURY! From rapid results through bioluminescence: to automated sample dilution, plate preparation and plate counting. Integrated BioSolutions is dedicated to solving the problems which face today's industrial microbiologist. New for 1993: A one-step, dipstick formatted screen for *E. coli* O157:H7 and *Salmonella*.

Phone: 908-274-1778
FAX: 908-274-1733

International BioProducts, Inc.

Redmond, WA

International BioProducts is dedicated to providing the highest quality products to the food microbiology laboratory. We offer the TECRA diagnostic products for the rapid detection of *Salmonella*, *Listeria*, Staphylococcal Enterotoxins A-E and Bacillus Diarrhoeal Enterotoxin. We sell over 500 general use laboratory supplies including dehydrated culture media, pipets, Petri dishes and sample bags.

Phone: 800-729-7611 (US)
800-745-1044 (Canada)
FAX: 206-881-6880

Klenzade, Ecolab Inc.

St. Paul, MN Sustaining Member

Klenzade, A Service of Ecolab Inc., is the market leading supplier of sanitation products, equipment and services to the dairy and food processing industries. Klenzade featured the LabVantage "K" dairy plant laboratory software systems, Klenz-Gel Blu one-step hand cleaner/sanitizer and Oxonia Active - patented peroxyacetic acid sanitizer.

Phone: 612-293-2549
FAX: 612-293-2260

Lab Products International

Raleigh, NC

Bioscreen is a microbiology system for the automation of procedures currently performed in cuvettes. The Bioscreen system consists of a computer controlled analyzer, built-in variable temperature incubator (0-60C), and a sample processing system to dispense media and samples. Bioscreen enables the enumeration of bacteria in food samples, determination of vitamins, and predictive modeling.

Phone: 800-522-3310, 919-847-0161
FAX: 919-870-9352

Meritech, Inc.

Englewood, CO Sustaining Member

Meritech, Inc. manufactures and distributes CleanTech® hand and glove washing systems. The installations now number over 200 because these systems have proven to:

- Standardize hand and glove washing
- Increase hand/glove washing effectiveness
- Increase hand/glove washing frequency
- Increase effectiveness of traditional methods

Phone: 303-790-4670, 800-932-7707
FAX: 303-790-4859

Michelson Laboratories

Commerce, CA Sustaining Member

Michelson Laboratories, an independent analytical testing laboratory, has the experience and expertise to handle your most difficult testing needs. Just a few of our services for foods, dairy products or environmental samples are: Chemical Analyses for pesticide residues or contaminated water; Microbiological Analyses for *Listeria*, *Salmonella* or *E. coli* O157:H7; and Microanalytical Analyses for Content or Nutritional Labeling. We also offer Milk Calibration samples for Infra-red Milk Analyzers and Electronic Somatic Cell Counters.

Phone: 310-928-0553
FAX: 310-927-6625

Micro Diagnostics, Inc.

Lombard, IL Sustaining Member

Micro Diagnostics, Inc. specializes in servicing microbiology laboratories. We manufacture a full line of prepared bacteriological culture media and distribute related microbiological specialties and supplies. We began our operation here in the Chicago area 10 years ago with the same philosophy we have today, which is to supply our customers with the highest quality products at a fair price, and to offer the best possible service available.

Phone: 708-628-6005, 800-634-7656
FAX: 708-628-6315

Monitor Company

Ceres, CA

Monitor Company displayed the New TempRecord digital temperature recorder. These unique, simple

to use recorders are typically used to record temperatures in processing, storage or transportation of temperature sensitive materials. Up to 32,000 samples can be recorded per use. Temperature range is -40°C to +75°C, with resolution of .1°C. Single use and multi-use models are available.

Phone: 209-537-3200
FAX: 209-537-3242

NASCO Whirl-Pak

Fort Atkinson, WI Sustaining Member

Nasco manufactures Whirl-Pak® sterile sampling bags with patented "Puncture Proof Tabs" eliminating bag puncture; sterility documentation is available for every box. A special bag containing a sponge is available for surface sampling to test for *listeria* and *salmonella*. New bags include a 300ml bag containing sodium thiosulfate for water sampling and a 24 ounce bag with an outside pocket to hold paperwork. Special bags are also available for use in the Stomacher® blender.

Phone: 414-563-2446
FAX: 414-563-8296

Nelson-Jameson, Inc.

Marshfield, WI Sustaining Member

Nelson-Jameson offers a wide range of unique products to help food & dairy processors integrate QA/QC with plant operations. Featuring over 7500 products, their 416-page Buyers Guide is free to qualified buyers. They also offer expert technical support, competitive prices, same-day shipping policy, and toll free fax or phone ordering.

Phone: 715-387-1151, 800-826-8302
FAX: 715-387-8746

Organon Teknika

Durham, NC Sustaining Member

Organon Teknika introduced EHEC-Tek™, an ELISA kit to screen food samples for the presence of *E. coli* O157:H7 within twenty-four hours. The excellent specificity of EHEC-Tek™ reduces the laboratory's volume of confirmatory testing. Organon Teknika also provides rapid screening kits and confirmatory assays for *Salmonella* and *Listeria*. These kits allow for early release of food products that are free of pathogens while minimizing hands-on time in the laboratory. Our ELISA based products for *Listeria*, *Salmonella*, and *E. coli* O157:H7 detection are recognized as the leaders in rapid testing systems.

Phone: 919-620-2000
FAX: 919-620-2107

PRISM Integrated Sanitation Management, Inc.

Miami, FL

PRISM Integrated Sanitation Management, Inc. provides sanitation services "in the back of the house" to the food industry. Our services include Guaranteed Pest Elimination, Hood & Duct Cleaning, Hood Grease Filter Exchange, Vector Fly

Machine, Soak Tank and Cleaning Chemicals. For more information contact Michael Moon, R.S. at
Phone: 305-592-6312
800-67-PRISM

Promega Corporation

Madison, WI

New in 1993 - the Total Environmental Swab Assay for detecting contamination on equipment surfaces from microorganisms and food and beverage residues. The TES Assay joins our 48-hour Yeasts & Molds Assay (for many foodstuffs) as the latest food industry offering from Promega, the leader in innovative food diagnostics.

Phone: 608-274-4330
FAX: 608-277-2516

Q Laboratories, Inc.

Cincinnati, OH

Q Laboratories, Inc. is an independent testing and consulting laboratory providing Microbiological and Analytical Chemistry support to the Dairy and Food Industries. Services include QC/Release Testing, Plant Sanitation Audits, HACCP Training, Nutritional Labeling Assays, and Complete Pathogen Analysis. Q Laboratories, Inc. provides analyst training and education programs in Sanitation and HACCP principles, and designs and implements Check Sample programs for corporate quality assurance.

Phone: 513-662-1300
FAX: 513-662-1380

REMEL

Lenexa, KS

Remel is a leading manufacturer of quality microbiology products which include prepared culture media (plates and tubes), strains, reagents, bottled media (for sterility testing and growth), contact plates for environmental sampling and a wide selection of other microbiology products for the dairy and food industries.

Phone: 913-888-0939
800-255-6730
FAX: 800-621-8251

R-TECH

Minneapolis, MN Sustaining Member

R-TECH offers complete chemical and microbiological testing services for food, feed, and wastewater samples. Specializations in dairy, meat, cereal, and oil products. Competitive pricing for all analytical services with no rush or fax charges.

Phone: 612-481-2363, 800-328-9687
FAX: 612-481-2002

Silliker Laboratories Group

Homewood, IL Sustaining Member

Silliker Laboratories Group is an internationally respected network of labs that specializes in as-

sessing the safety, quality, and nutritional value of foods. Food testing capabilities include comprehensive microbiological and analytical chemistry analyses including nutrition labeling. Silliker also offers custom-designed research services including shelf-life and challenge studies, technical consulting services such as food plant sanitation audits, and food safety education courses. New for '93; the addition of our 13th facility in Madison, WI.

Phone: 708-957-7878
FAX: 708-957-8449

SmithKline Beecham Animal Health

Exton, PA Sustaining Member

SmithKline Beecham Animal Health offers technology to enable food and milk processors to test products for sulfamethazine/gentamicin and antibiotic residues. The Penzyme Farm Test and Penzyme III Antibiotic Residue Test detect beta-lactam antibiotics in milk. The Signal Foresite Sulfamethazine and Gentamicin Tests can be run on milk, tissue, serum or feed to detect these residues in four minutes.

Phone: 215-363-3764, 800-877-6250
FAX: 215-363-3284

Southeast Laboratory Div. of Microbac Laboratories

Atlanta, GA

Microbac Laboratories, Inc. is a full-service environmental testing company, providing quality analyses to schools, industries, commercial businesses and homeowners for the past 20 years. Our staff consists of over 150 highly-qualified chemists, microbiologists, sampling technicians, asbestos inspectors, food technologists, sanitation inspectors and other environmental specialists. Microbac's multiple locations (18 laboratories nationwide) allow us to effectively provide food-borne illness investigations, hazardous waste sampling and analyses, drinking water testing, and other services to address areas of concern to the IAMFES membership. Each laboratory adheres to strict quality control protocols to assure accurate testing results.

Phone: 404-873-1896
FAX: 404-873-1880

Spiral Biotech, Inc.

Bethesda, MD

Featured Products: 1) NEW spiral plater (to eliminate serial dilutions), the Autoplate Model 3000; 2) Diluflo 800 (automates sample dilutions); 3) Automatic Bacteria Counters (rapid bacterial counts); 4) MikroClave (6-7 minute sterilization of up to 1200 ml media); 5) Portable Microbial Air Samplers.

Phone: 301-657-1620
FAX: 301-652-5036

3-A Sanitary Standards Symbol Administrative Council

Cedar Rapids, IA

Information relating to 3-A Sanitary Standards for processing equipment and authorization to use the 3-A Symbol was available at the Symbol Council booth.

Phone: 319-395-9151
FAX: 319-393-1102

3M Microbiology

St. Paul, MN Sustaining Member

Petrifilm™ plates have been proven to increase lab testing efficiency an average of 82% and offer quality control made easy. Petrifilm plates save time because they're easier to use and deliver consistent, easy-to-read results. They reduce microbial testing to three simple steps. The Petrifilm plate family includes: Petrifilm aerobic count plates, Petrifilm coliform count plates, Petrifilm high-sensitivity coliform count plates, Petrifilm *E. coli* count plates, and Petrifilm yeast and mold count plates. Also available is the Petrifilm test kit-HEC for hemorrhagic *E. coli* O157:H7 testing in meat and poultry. 3M can increase testing efficiency in your lab.

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Troy Biologicals

Troy, MI Sustaining Member

Distributor of Quality Microbiological Products for Industry and Research.

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FAX: 313-585-2490

Unipath Inc., Oxoid Division

Nepean, ON, Canada Sustaining Member

Oxoid manufactures a complete range of Dehydrated Culture Media, Peptones and Hydrolysates. We will custom manufacture to private specific formulae for individual needs. We will launch a new

Anaerobic Atmosphere Generating System - No Catalyst is Required - No Water is Required. The *E. coli* Latex Kit for identification of O157 serogroup was displayed.

Phone: 800-567-8378, 613-226-1318
FAX: 613-226-3728

VICAM

Watertown, MA Sustaining Member

VICAM manufactures microbiological testing systems for the food industry. VICAM's>Listertest™ a>Listeriatesting system uses immunomagnetic bead technology, is easy to use and provides quantitative, economical detection of *Listeria* in environmental and food samples within 24 hours. No enrichment is required. VICAM also manufactures rapid quantitative Mycotoxin Testing Kits for Aflatoxin, Fumonisin, Ochratoxin and Zearalanone. For more information contact Marianne Hamilton at 800-338-4381.

Phone: 617-926-7045, 800-338-4381
FAX: 617-923-8055

Walker Stainless Equipment Company, Inc.

New Lisbon, WI Sustaining Member

Walker designs and fabricates sanitary and industrial stainless steel tanks, heat exchangers, isolators, transport tanks and custom-built equipment. High quality engineering, fabricating and metal finishing skills have been developed in over 50 years of service to the Dairy and allied liquid process industries. Product photographs and models were displayed.

Phone: 608-562-3151
FAX: 608-562-3178

Weber Scientific

Hamilton, NJ

Weber Scientific featured products used in the analysis of dairy, food and water/wastewater. Weber Scientific specializes in equipment for bacteria and

antibiotic residue detection, butterfat, temperature and sanitation testing, as well as general laboratory equipment. Many hard-to-find items were featured.

Phone: 800-328-8378, 609-584-7677
FAX: 609-584-8388

West Agro, Inc.

Kansas City, MO Sustaining Member

West Agro is one of the Tetra Laval Group companies dedicated to serving the Food, Dairy & Beverage Industries. We offer a high quality line of cleaners & sanitizers for these industries. Clean Front Iodine Blocks, a revolutionary environmental control tool were available at our booth.

Phone: 816-891-1600, 816-891-1558
FAX: 816-891-1600

World Dryer Corporation

Berkeley, IL Sustaining Member

World Dryer manufactures a line of "Touchless" Handwashing Equipment designed for food handlers. The systems dispense soap, water and warm air and are sensor activated to eliminate recontamination of clean hands after washing. Features include a cycle counter to monitor the number of handwashes, a low soap indicator light, and handwashing instructions that are permanently posted on the washstation.

Phone: 708-449-6950, 800-323-0701
FAX: 708-449-6950

Zep Manufacturing Co.

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Zep Manufacturing Company, a Division of National Service Industries, has been a leader in maintenance and sanitation supplies for over 56 years, providing customers with Cost-Effective Quality Products, Unparalleled Customer Service, Comprehensive Technical Support and Unconditional Money Back Guarantee.

Phone: 404-352-1680
FAX: 404-350-6238

The International Association of Milk, Food and Environmental Sanitarians would like to thank these companies for their support of and participation in the 1993 Annual Meeting.

To receive information on the 1994 IAMFES Annual Meeting Exhibits in San Antonio, Texas, please contact the IAMFES office at (800) 369-6337 (US) • (800) 284-6336 (Canada) • (515) 276-3344

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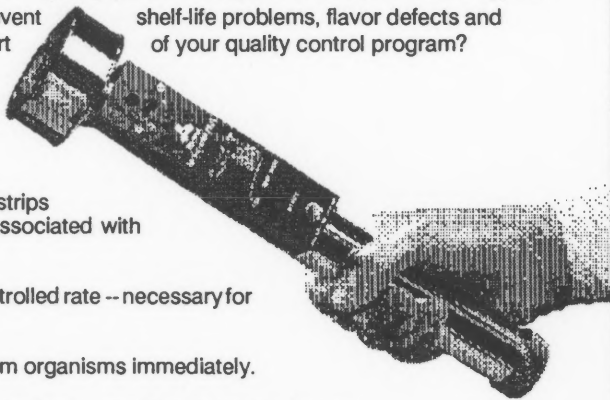
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Attack Air Quality Problems

The RCS Air Sampler detects air quality problems days or even weeks before typical sampling methods. Giving you time to prevent spoilage in your products. Shouldn't it be a part of your quality control program?

Features

- Impinges airborne microorganisms onto agar strips using centrifugal force -- eliminates chance associated with sedimentation methods.
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3-A Sanitary Standards for Plug-Type Valves for Milk and Milk Products, Number 51-00 (08-17P)

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, USPBS, 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. Plug-type valves specifications heretofore or hereafter developed which so differ in design, material, construction, or otherwise, as not to conform with the following standards, but which in the manufacturer's or fabricators opinion are equivalent or better may be submitted for the joint consideration of IAMFES, USPHS, and DIC at any time.

A

SCOPE

A.1

These standards cover the sanitary aspects of plug-type valves used on processing equipment and on equipment and lines which hold or convey milk or milk products. These standards do not pertain to thermoplastic plug-type valves which are covered by current 3-A Sanitary Standards for Plastic Plug-Type Valves for Milk and Milk Products, Number 52-00.

A.2

In order to conform to these 3-A Sanitary Standards, plug-type valves shall comply with the following in design, material and fabrication criteria.

B

DEFINITIONS

B.1

Product: Shall mean milk and milk products.

B.2

SURFACES

B.2.1

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

B.2.2

Nonproduct Contact Surfaces: Shall mean all other exposed surfaces.

B.3

Electrodeposition: Shall mean coated to specific dimensions or processed to specific dimensions after coating.¹

C

MATERIALS

C.1

Product contact surfaces shall be of stainless steel of the AISI 300 Series² or corresponding ACT³ types (See Appendix, Section E.) or metal which is equal in cleanability to stainless steel of the foregoing types, and which under conditions of intended use is equally corrosion resistant, nontoxic and nonabsorbent except that:

C.1.1

Valve bodies or valve plugs made of materials provided for in C.1 may be covered with an electrodeposited coating of chromium.

C.1.2

Valve bodies or valve-plugs may be made of nontoxic corrosion-resistant stainless metal (400 series stainless steel², or equivalent) or these materials covered with an electrodeposited coating of chromium.

C.1.3

Valve-plug cores, if completely covered may be made of metal, plastic or rubber or rubber-like materials.

C.1.4

Rubber and rubber-like materials may be used for gaskets, O-rings, seals, valve-plug coverings and parts having the same functional purposes.

C.1.5

Rubber and rubber-like materials, when used, shall conform to the applicable provisions of the current 3-A Sanitary Standards for Multiple-Use Rubber and Rubber-Like Materials Used as Product Contact Surfaces in Dairy Equipment, Number 18-00.

C.1.6

Plastic materials may be used for gaskets, valve-plugs, valve-plug coverings, O-rings, seals and parts used in similar applications having the same functional purposes.

C.1.7

Plastic materials, when used, shall conform to the applicable provisions of the current 3-A Sanitary Standards for Multiple-Use Plastic Materials Used as Product Contact Surfaces for Dairy Equipment, Number 20-18.

C.1.8

Rubber and rubber-like materials and plastic materials

¹ QQ-C-320B-Federal Specification for Chromium Plating (Electrodeposited) June 17, 1974 with Amendment 4, April 10, 1987. This document available from the General Services Administration, 18th & F Sts., NW, WFCIA, Washington, DC 20405, (202-472-2205) (Use most current edition).

² The data for this series are contained in the AISI Steel Products Manual, Stainless & Heat Resisting Steels, November 1990, Table 2-1, pp. 17-20. Available from the Iron and Steel Society, 410 Commonwealth Drive, Warrendale, PA 15086 (412-776-9460) (Use most current edition).

³ Steel Founders Society of America Cast Metal Federation Bldg., 455 State St., Des Plaines, IL 60016 (708-299-9160).

having product contact surfaces shall be of such composition as to retain their surface and conformational characteristics when exposed to the conditions encountered in the environment of intended use and in cleaning and bactericidal treatment.

C.1.9

Bonded rubber and rubber-like materials and bonded plastic materials having product contact surfaces that are a bonded coating or a covering shall be of such composition as to retain their surface and conformation characteristics when exposed to the conditions encountered in the environment of intended use and in cleaning and bactericidal treatment.

C.1.10

The final bond and residual adhesive, if used, on bonded rubber and rubber-like materials and bonded plastic materials shall be nontoxic.⁴

C.2

All nonproduct contact surfaces shall be of corrosion-resistant material or material that is rendered corrosion resistant. All nonproduct contact surfaces shall be relatively nonabsorbent, durable and cleanable. Parts removable for cleaning having both product contact and nonproduct contact surfaces shall not be painted.

D

FABRICATION

D.1

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

D.2

All permanent joints in metallic product contact surfaces shall be continuously welded. Welded areas on product contact surfaces shall be at least as smooth as a No. 4 ground finish on stainless steel sheets, and be free of imperfections such as pits, folds, and crevices.

D.3

The minimum thickness of an electrodeposited coating shall not be less than 0.0002 in. (0.005 mm) for all product contact surfaces when used on stainless steel. When these surfaces are other than stainless steel, the thickness of an electrodeposited coating shall not be less than 0.002 in. (0.05 mm).

D.4

Product contact surfaces shall be easily accessible for cleaning and inspection either when in an assembled position or when removed. Removable parts shall be demountable by hand or by using simple hand tools, used by operating or cleaning personnel.

D.5

Product contact surfaces which are not self-draining shall be constructed so that they can be readily and easily opened and drained.

D.6

GASKETS

⁴ Adhesives shall comply with 21 CFR Part 175 - Indirect food additives. Adhesives and components of coatings. Document for sale by the Superintendent of Documents, U.S. Government Office, Washington, DC 20402 (202-783-3238) (Use most current edition).

D.6.1

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

D.6.2

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

D.6.3

Grooves in gaskets shall be no deeper than their width.

D.6.4

Gasket grooves or gasket retaining grooves in product contact surfaces for removable gaskets shall not exceed 1/4 in. (6 mm) in depth or be less than 1/4 in. (6 mm) wide except those for standard O-rings smaller than 1/4 in. (6 mm) and those provided for in Section D.11.

D.7

Radii

D.7.1

All internal angles of 135 degrees or less on product contact surfaces, shall have radii of not less than 1/8 in. (3 mm) except that:

D.7.1.1

Smaller radii may be used when they are required for essential functional reasons, such as those in flat sealing surfaces. In no case shall such radii be less than 1/32 in. (1 mm).

D.7.1.2

The radii in gasket grooves, gasket retaining grooves or grooves in gaskets, shall not be less than 1/8 in. (3 mm) except for those for standard 1/4 in. (6 mm) and smaller O-rings, and those provided for in Section D.11.

D.7.1.3

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

D.8

There shall be no threads on product contact surfaces.

D.9

Plain end valve fittings for use in welded sanitary pipelines shall conform to the provisions of these standards with respect to material, finish and construction. The inside diameter of the butt welding ends shall be the same as that of the part to which it is to be welded.

D.10

Powered Valve Actuators

D.10.1

Valves with powered actuators shall have an open space of at least 1 in. (25 mm), clear for inspection, between the actuator and the valve.

D.10.2

Powered actuators shall be readily demountable from the valve and stem.

D.11

All sanitary fittings and connections shall conform with

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103	116	129	142	155	168	181	194	207	220	233	246	259	272	285	298	311	324	337	350
104	117	130	143	156	169	182	195	208	221	234	247	260	273	286	299	312	325	338	351
105	118	131	144	157	170	183	196	209	222	235	248	261	274	287	300	313	326	339	352
106	119	132	145	158	171	184	197	210	223	236	249	262	275	288	301	314	327	340	353
107	120	133	146	159	172	185	198	211	224	237	250	263	276	289	302	315	328	341	354
108	121	134	147	160	173	186	199	212	225	238	251	264	277	290	303	316	329	342	355
109	122	135	148	161	174	187	200	213	226	239	252	265	278	291	304	317	330	343	356
110	123	136	149	162	175	188	201	214	227	240	253	266	279	292	305	318	331	344	357
111	124	137	150	163	176	189	202	215	228	241	254	267	280	293	306	319	332	345	358
112	125	138	151	164	177	190	203	216	229	242	255	268	281	294	307	320	333	346	359
113	126	139	152	165	178	191	204	217	230	243	256	269	282	295	308	321	334	347	360

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102	115	128	141	154	167	180	193	206	219	232	245	258	271	284	297	310	323	336	349
103	116	129	142	155	168	181	194	207	220	233	246	259	272	285	298	311	324	337	350
104	117	130	143	156	169	182	195	208	221	234	247	260	273	286	299	312	325	338	351
105	118	131	144	157	170	183	196	209	222	235	248	261	274	287	300	313	326	339	352
106	119	132	145	158	171	184	197	210	223	236	249	262	275	288	301	314	327	340	353
107	120	133	146	159	172	185	198	211	224	237	250	263	276	289	302	315	328	341	354
108	121	134	147	160	173	186	199	212	225	238	251	264	277	290	303	316	329	342	355
109	122	135	148	161	174	187	200	213	226	239	252	265	278	291	304	317	330	343	356
110	123	136	149	162	175	188	201	214	227	240	253	266	279	292	305	318	331	344	357
111	124	137	150	163	176	189	202	215	228	241	254	267	280	293	306	319	332	345	358
112	125	138	151	164	177	190	203	216	229	242	255	268	281	294	307	320	333	346	359
113	126	139	152	165	178	191	204	217	230	243	256	269	282	295	308	321	334	347	360

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the applicable provisions of the current 3-A Sanitary Standards for Fittings Used on Milk and Milk Products Equipment and Used on Sanitary Lines Conducting Milk and Milk Products, Number 63-.

D.12

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

APPENDIX

E

STAINLESS STEEL MATERIALS

Stainless steel conforming to the applicable composition ranges established by AISI for wrought products, or by ACI for cast products, should be considered in compliance with the requirements of Section C.1 herein. Where welding is involved, the carbon content of the stainless steel should not exceed 0.08 percent. The first reference cited in C.1 sets forth the chemical ranges and limits of acceptable stainless steel of the 300 Series. Cast grades of stainless steel corresponding to type 302, 303, 304, and 316 are designated CF-20, CF-16F, CF-8 and CF-8M, respectively. The chemical composition of these cast grades are covered by ASTM*6 specifications A351/A351M, A743/A743M and A744/A744M.

*5 Available from ASTM, 1916 Race St., Philadelphia, PA 19103-1187 (215-299-5400) (Use most current edition).

*6 Available from American Society of Mechanical Engineers, 345 East 47th Street, New York, NY 10017 (212-705-7722) (Use most current edition).

F

PRODUCT CONTACT SURFACE FINISH

Surface finish equivalent to 150 grit or better as obtained with silicon carbide, properly applied on stainless steel sheets, is considered in compliance with the requirements of Section D.1 herein. A maximum Ra of 32 micro in. (0.8 micro meter), when measured according to recommendations in ANSI/ASME B.46.1-Surface Texture, is considered equivalent to a No. 4 finish*5.

G

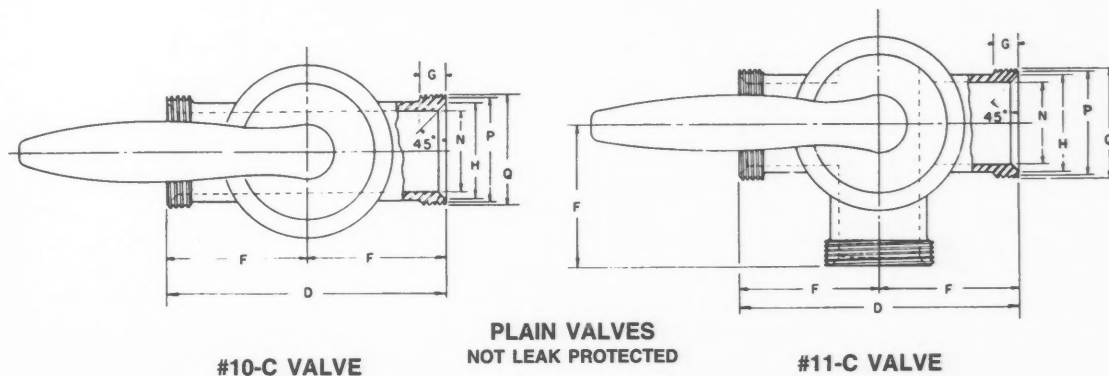
DIAGRAMS

These diagrams are intended to demonstrate general principles only, and are not intended to limit individual ingenuity. The design used should conform with the sanitary requirements set forth in these 3-A Sanitary Standards. The following examples are included in this Appendix:

Valve Name	3-A Drawing	
	Page	Number
Plain Valve - 10C & 11C	688	3-A-100-01
Plain Valve - 10BF, 30-F Angle Valve & 33-F Can Filler	689	3-A-100-07
Plain Valve - 10 BFG, 30-FG Angle Valve & 33-FG Can Filler	690	3-A-100-08

These standards are effective November 21, 1993, at which time 3-A Sanitary Standards for Plug-Type Valves Used on Milk and Milk Products Equipment and Used on Sanitary Lines Conducting Milk and Milk Products, Numer 08-17 Rev. and as amended will become null and void.

3A STANDARD SANITARY FITTINGS 3A-100-01



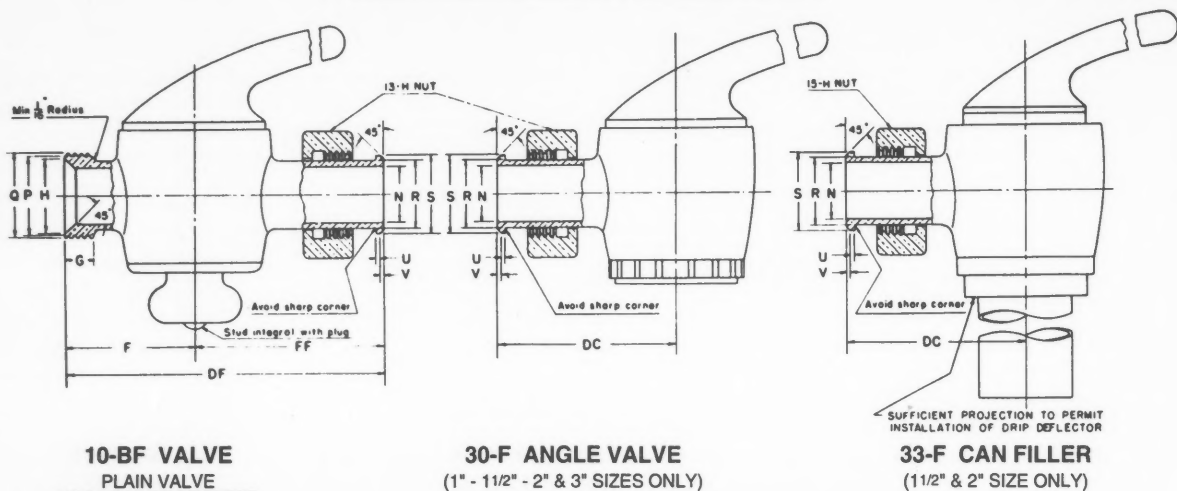
#10-C VALVE

PLAIN VALVES
NOT LEAK PROTECTED

#11-C VALVE

SIZE	TUBE GAGE	ACME THREADS PER INCH	D	F	G _{MAX}	H	N	P	Q
1"	18	8	4 9/16"	2 9/32"	9/16"	1 3/16"	.902"	1.317"	1.462"
1 1/2"	18	8	5 13/16"	2 29/32"	9/16"	1 23/32"	1.402"	1.849"	1.994"
2"	16	8	6 13/16"	4 13/32"	19/32"	2 1/4"	1.870"	2.381"	2.526"
2 1/2"	16	8	8 1/4"	4 1/8"	23/32"	2 3/4"	2.370"	2.913"	3.058"
3"	16	8	9 7/16"	4 23/32"	3/4"	3 5/16"	2.870"	3.445"	3.590"
4"	14	8	13 1/16"	6 17/32"	7/8"	4 1/4"	3.834"	4.509"	4.695"

3A STANDARD SANITARY FITTINGS 3A-100-07



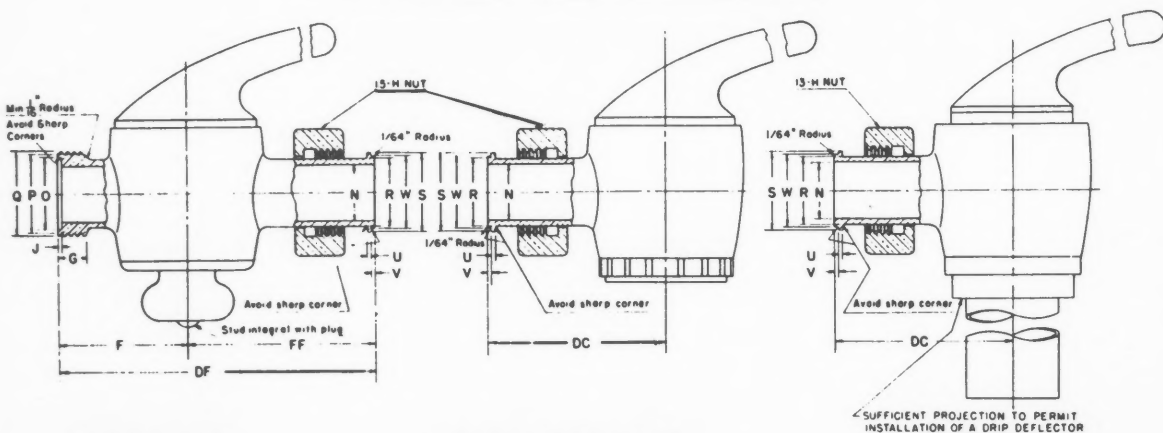
10-BF VALVE
PLAIN VALVE
NOT LEAK PROTECTED

30-F ANGLE VALVE
(1" - 1 1/2" - 2" & 3" SIZES ONLY)

33-F CAN FILLER
(1 1/2" & 2" SIZE ONLY)

SIZE	ACME THREADS PER INCH	DF	F	FF	DC	V	G _{MAX}	H	N	P	Q	R	S	U
1"	8	5 5/8"	2 9/32"	3 11/32"	3 5/32"	1/8"	9/16"	1 3/16"	.902"	1.317"	1.462"	1.160"	1.316"	3/16"
1 1/2"	8	6 31/32"	2 29/32"	4 1/16"	3 11/16"	5/32"	9/16"	1 23/32"	1.402"	1.849"	1.994"	1.676"	1.848"	3/16"
2"	8	8 5/32"	3 13/32"	4 3/4"	3 1/2"	5/32"	19/32"	2 1/4"	1.870"	2.381"	2.526"	2.192"	2.380"	1/4"
2 1/2"	8	10"	4 1/8"	5 7/8"	—	3/16"	23/32"	2 3/4"	2.370"	2.913"	3.058"	2.708"	2.912"	1/4"
3"	8	11 7/32"	4 23/32"	6 1/2"	5 27/32"	3/16"	3/4"	3 5/16"	2.870"	3.445"	3.590"	3.224"	3.444"	9/32"
4"	8	14 13/32"	6 17/32"	7 7/8"	—	1/4"	7/8"	4 1/4"	3.834"	4.509"	4.695"	4.256"	4.508"	5/16"

3A STANDARD SANITARY FITTINGS 3A-100-08



10-BFG VALVE
PLAIN VALVE
NOT LEAK PROTECTED

30-FG ANGLE VALVE
(1" - 1 1/2" - 2" & 3" SIZES ONLY)

33-FG CAN FILLER
(1 1/2" & 2" SIZE ONLY)

SIZE	ACME THREADS PER INCH	DF	F	FF	DC	V	G _{MAX}	J	N	O	P	Q	R	S	U	W
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3"	8	10 29/32"	4 17/32"	6 3/8"	5 23/32"	3/32"	9/16"	.062"	2.870"	3.312"	3.445"	3.590"	3.224"	3.444"	1/4"	3.280"
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CIRCLE READER SERVICE NO. 325

Coming Events

1993

December

•**2-3, Starch: Structure, Properties, and Food Uses**, sponsored 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.

•**3, Food Labels: Learning the New Language**, A Workshop on the New FDA and USDA Food Labeling Requirements, will be held in Kansas City, MO. This workshop is co-sponsored by The American Dietetic Association Foundation and The Food Processors Institute and developed with a grant from Campbell Soup Company. For more information contact The Food Processors Institute (DLC), 1401 New York Avenue, NW, Suite 400, Washington, DC 20005, (202)393-0890.

•**5, Food Labels: Learning the New Language**, A Workshop on the New FDA and USDA Food Labeling Requirements, will be held in Cleveland, OH. This workshop is co-sponsored by The American Dietetic Association Foundation and The Food Processors Institute and developed with a grant from Campbell Soup Company. For more information contact The Food Processors Institute (DLC), 1401 New York Avenue, NW, Suite 400, Washington, DC 20005, (202)393-0890.

•**6-7, Food Safety for Zero Defects Seminar**, sponsored by ASI Food Safety Consultants, Inc., will be held at the Holiday Inn O'Hare International, Chicago, IL. For more information, call Kim Schroeder at (800)477-0778 or in Missouri at (314)725-2555.

•**8-10, Symposium on Antibiotics and Sulfonamides in Milk: Significance, Detection and Development of an Integrated Detection System**, sponsored by the International Dairy Federation with AOAC International, to be held at the Conference Centre Kolle Kolle, Copenhagen, Denmark. For more information contact Prof. Dr. W. Heeschen, Bundesanstalt für Milchforschung, Hermann Weigmann-Str.1, 2300 Kiel 1, Germany, Tel. +49 431 609 392, FAX: +49 431 609 222.

•**14-16, Food Manager Certification Conference-Workshop**, sponsored by the Conference for Food Protection, will be held in Chicago, IL. For more information contact Shirley B. Bohm, Chair, Food Protection Management Certification Committee, at (217)785-2439 or FAX (217)524-0802.

1994

January

•**3-5, Milling for Cereal Chemists**, sponsored by the American Association of Cereal Chemists, will be held in Manhattan, KS. 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.

•**12-15, 1994 U.S. Dairy Forum**, sponsored by the International Dairy Foods Association, will be held at the Doral Resort and Country Club, Miami, FL. For more information contact IDFA, 888-16th Street, NW, 2nd Floor, Washington, DC 20006; (202)296-4250; FAX (202)331-7820.

•**25-28, Water Activity: Theory, Management, and Food Applications**, sponsored by the American Association of Cereal Chemists, will be held in St. Paul, MN. 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.

March

•**7-10, Better Process Control School**. For more information please contact Robert Price (916/752-2194) or Pamela Tom (916/752-3837), Food Science and Technology Department, University of California, Davis, CA 95616-8598, FAX: 926/752-4759.

•**16, Annual Food Industry Conference** will be sponsored by the Food Science Department at Purdue University. For more information contact James V. Chambers, Food Science Department, Smith Hall, Purdue University, West Lafayette, IN 47907, Phone: (317)494-8279.

April

•**18-21, Purdue Better Process Control School** will be sponsored by the Food Science Department at Purdue University. For more information contact James V. Chambers, Food Science Department, Smith Hall, Purdue University, West Lafayette, IN 47907, Phone: (317)494-8279.

May

•**7-12, Food Structure Annual Meeting** will be held at the Holiday Inn Downtown City Hall, Toronto, Ontario, Canada. For more information, please contact Dr. Om Johari, SMI, Chicago (AMF O'Hare), IL 60666-0507, USA (or call 708-529-6677, FAX: 708-980-6698).

•**18-21, Purdue Better Process Control School** will be sponsored by the Food Science Department at Purdue University. For more information contact James V. Chambers, Food Science Department, Smith Hall, Purdue University, West Lafayette, IN 47907, Phone: (317)494-8279.

•**25-27, International Conference on Food Physics**, sponsored by the International Society of Food Physicists and the Editorial Board of Journal of Food Physics, will be held at the University of Horticulture and Food Industry, Budapest, Hungary. For further information contact A. S. Szabo, President of the Organizing Committee, H-1118 Budapest, Somloi Street 14-16, Phone: 361-1850-666/470, Fax: 361-166-6220.

•8-15, Rapid Methods and Automation in Microbiology International Workshop XIV, to be held at Kansas State University, Manhattan, KS. For more information contact Dr. Daniel Y. C. Fung at (913)532-5654, FAX (913)532-5681. A mini-symposium will occur on July 8th and 9th.

•31-August 3, 81st Annual Meeting of the International Association of Milk, Food and Environmental Sanitarians will be held at the Hyatt Regency Hotel, San Antonio, TX. For more information contact: Julie Heim — Registration; Scott Wells — Exhibits; at (800)369-6337 (US), (800)284-6336 (Canada), or (515)276-3344.

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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