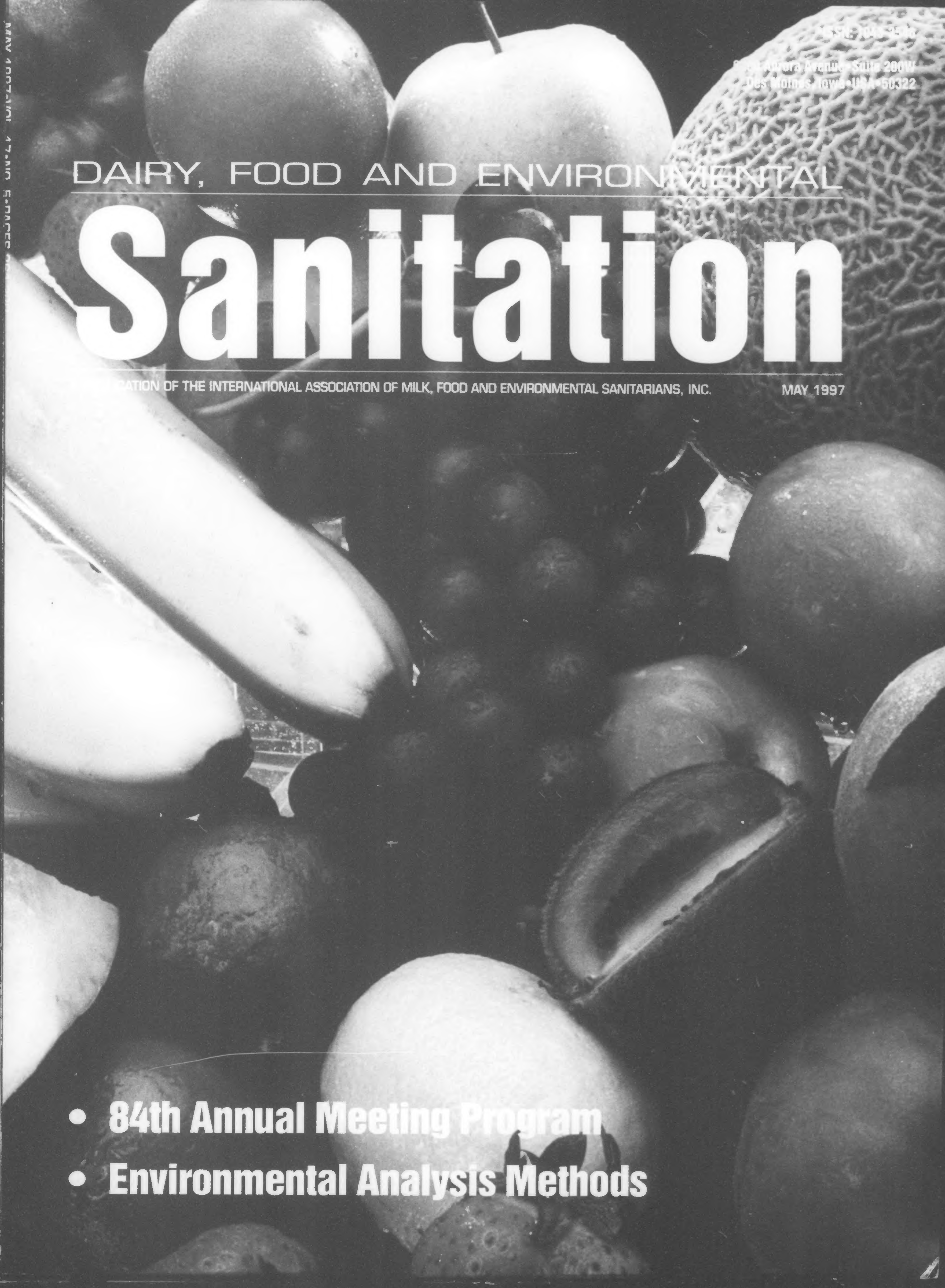

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DAIRY, FOOD AND ENVIRONMENTAL

Sanitation

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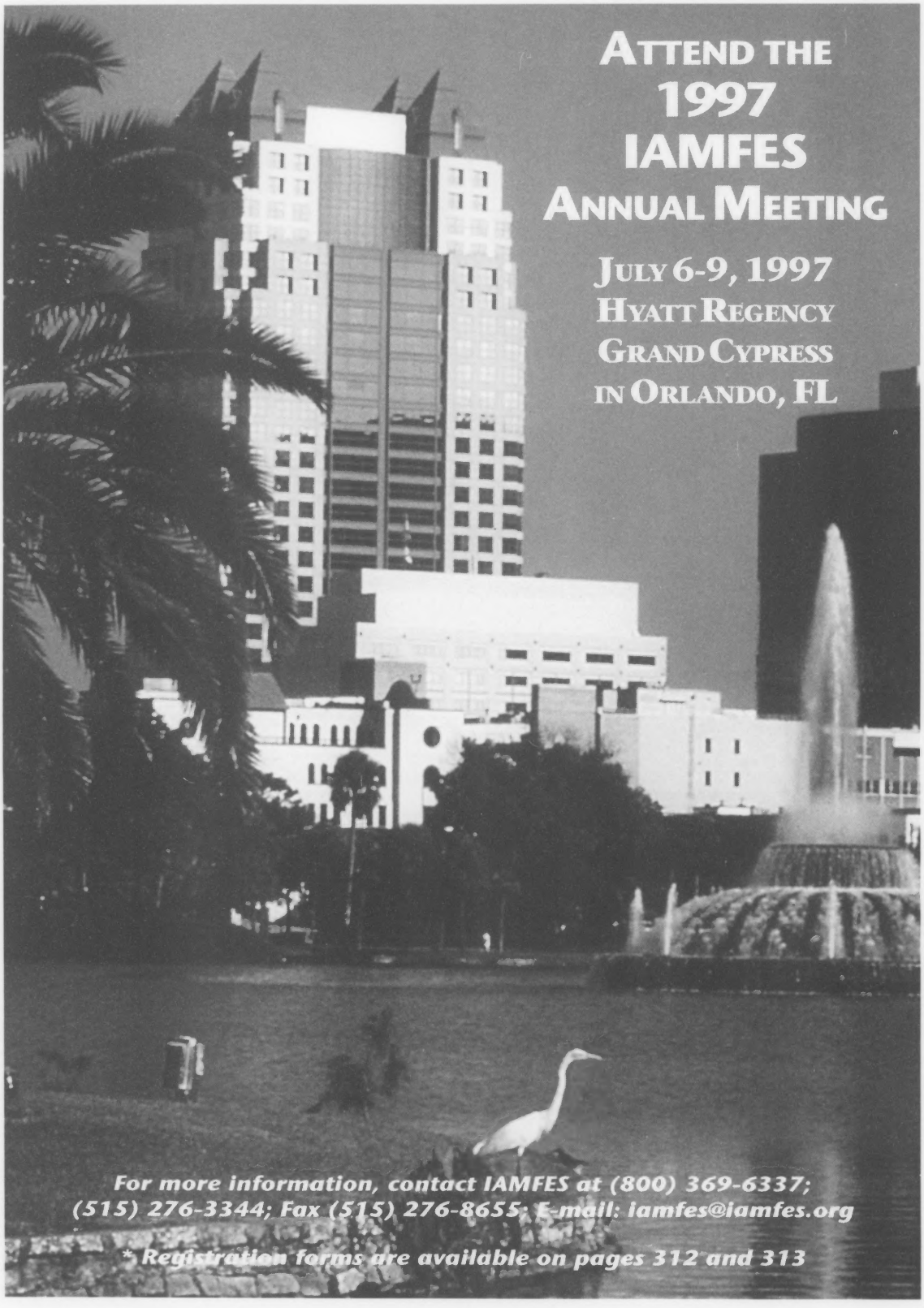
- Environmental Analysis Methods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OFF THE TOP

FROM THE PRESIDENT

By MICHAEL H. BRODSKY
IAMFES President

"Coming out, but not to party; Am I my brother's keeper?"

From March 24 to 26, 1997, I had the pleasure of representing IAMFES at a conference on *Emerging Foodborne Pathogens, Implications and Control* in Alexandria, VA. This conference was organized by International Life Sciences Institute (ILSI), ILSI North America Technical Committee on Food Microbiology, U.S. Centers for Disease Control and Prevention (CDC), U.S. Department of Agriculture (USDA) and U.S. Food and Drug Administration (FDA), in cooperation with Food and Agriculture Organization (FAO) and Pan American Health Organization (PAHO)/ World Health Organization (WHO) and supported by a number of private sector food companies. The organizers were hoping for about 250 registrants, but there were over 400 attendees, many of whom I recognized through their affiliation with IAMFES.

The goal of the conference was essentially to conduct a formal collaborative review of the issues related to the hows and whys of emerging foodborne pathogens. Welcoming remarks were made by representatives from each of the organizing agencies and each used the opportunity to reflect on how their organization was addressing emerging foodborne disease issues. In spite of the differences in approach, they agreed that the problems are on a global scale, requiring a multifaceted approach involving academia, industry, and public and private sector partnerships. In particular, Dr. Alex Malaspina, President of ILSI, made special mention of ILSI's relationship with IAMFES. It was unfortunate that we were not involved as a co-sponsor of this event. It's clear to me that there is no organization better suited to this type of venue than IAMFES. We need to ensure that we become partners of any future meetings in this area while continuing to offer interested parties a forum for open discussion at our Annual Meetings. Our Professional Development Groups are ideally suited for this purpose. To this end, I had a number of informal discussions with Catherine Nnoka, (ILSI) and suggested that she attend one of our board meetings to discuss how to strengthen the bonds between ILSI and IAMFES. I am hopeful that we can arrange such a meeting during our Annual Meeting in July, or at our fall board meeting.

The keynote address was presented by former Nobel Prize winner, Dr. Joshua Lederberg, who discussed the scope of the problem in global terms. He compared our struggle against foodborne disease as a race against time. Dr. Lederberg's references to the need for knowledge integration involv-

ing, improved vector management, personal hygiene, enhanced surveillance programs, public education, and research and development, were echoed by many speakers throughout the conference.

The program was divided into four sessions, each focusing on a specific concern. Abstracts of each of the formal presentations were provided in the program booklet to all attendees and are available from ILSI. Similarly, the proceedings will be published.

The first session addressed factors that influence the emergence or reemergence and dissemination of foodborne pathogens, in terms of microbial pathogenicity, host susceptibility and environmental conditions. Two themes that I identified in this session were the need for prevention of contamination of our food supply and the need for improved epidemiology with less reliance on laboratory confirmation. The latter results in an underestimation of the incidence of foodborne illness due to the high frequency of sporadic cases which are difficult to corroborate and the multiplicity of microbial virulence factors which may impact only on selected populations.

The second session looked at identifying and anticipating new foodborne microbial hazards. The significance of risk assessment and the importance of surveillance programs combined with good epidemiology were recurring themes by many participants in this session.

The third session addressed the issue of controlling emerging foodborne pathogens. During this session, the role of the consumer as a food handler was emphasized, as well as improvements to food processing technology. The application of predictive microbiology to risk assessment and the importance of epidemiological investigations which focus on prevention, particularly with respect to viruses and parasites, were also stressed.

The final session was an attempt to develop strategies for mobilizing resources for rapid response to emerging foodborne pathogens with a panel discussion and audience participation. New approaches to "old friends" such as *Clostridium botulinum* were discussed, as well as the lessons we are learning from new enemies, including Verotoxigenic *Escherichia coli, Cryptosporidium* and *Cyclospora.*

I believe that the conference achieved its goals. Certainly all of us became much more acutely aware of the impact of various factors which enhance the emergence of foodborne infections; but, simply being aware:

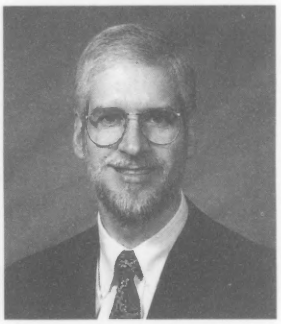
- that globalization of the food supply spreads pathogens around the world;
- or that pathogens can be inadvertently introduced into new geographic areas which are unprepared to deal with the etiological agent;
- or that travelers, immigrants and refugees may be exposed to unfamiliar foodborne hazards;
- or that microbes are evolving and developing enhanced virulence characteristics and resistance factors;
- or that there are increasingly susceptible populations due to aging, high birth rate, improved medical treatments and the use of immunosuppressive drugs to prolong life, or the development of immunosuppressive diseases;
- and, of course, that there are lifestyle changes in which we seek convenience foods requiring minimal preparation time or prepared by someone else, will not solve the problem. That is the gauntlet thrown to us.

A second conference is being planned for 1999. It will be interesting to see if knowledge really is power. We must take this knowledge and put it to use in our daily lives. We have a responsibility to those who look to us for direction, to live as we preach. We are our brothers' keepers!

As always, if you have any comments on this column, please don't hesitate to contact me (E-mail: brodskm@gov.on.ca; Phone (416) 235-5717; or Fax (416) 235-5951).

COMMENTARY

FROM THE EXECUTIVE DIRECTOR



By DAVID W. THARP
IAMFES Executive Director

"Become involved; help others to learn what you know"

How do you support IAMFES? Many of our Members are very involved. Some are not. It is understood that anyone who joins a group or an association joins for a wide variety of reasons. Not everyone has time and effort to expend in support of everything that interests them. However, I would like to bring to your attention the many ways that you can support IAMFES without interfering with your busy schedule.

First and easiest is to continue your Membership in IAMFES. Of course, that means we, as an Association, must be serving your needs. If there are avenues you feel IAMFES should be pursuing to serve you, have you voiced your opinion? I invite you to contact me with your ideas. Once you are satisfied that we are serving your needs (or let us make the assumption that we are serving your needs), we encourage you to bring IAMFES to the attention of other professionals. Your invitation to a colleague to join IAMFES means so much more to that person than us sending mailings to the same person. Become involved in actively supporting IAMFES by talking about IAMFES and encouraging others to do the same. Your enthusiasm will generate more excitement and interest!

Another way to become involved is by attending the IAMFES Annual Meeting. This year's will be July 6 to 9 in Orlando, Florida. You have the opportunity to learn about-up-to date information affecting your area(s) of interest. While you are at the Annual Meeting, you will be able to attend and view more than 200 presentations. You can ask questions, discuss with presenters, network with colleagues, meet new associates, and learn about new products in our Exhibit Hall. In addition, your involvement is welcome at our Committee, Professional Development Group, and Task Force meetings on July 6. If you have an interest, we probably have a group you can contribute to. The majority of our Professional Development Groups create symposia to present at our next Annual Meeting. Do you have suggestions? Become involved; help others to learn what you know. It will give you a real feeling of satisfaction.

We are always looking for papers, both research and general interest, for publication in *Dairy, Food and Environmental Sanitation* and in *Journal of Food Protection*. Both publications provide excellent opportunities for you to share your knowledge with other interested parties. We received more than 350 submissions of papers to publish in *Journal of Food Protection* last year, but we still want yours! If you have an application-oriented paper, we encourage you to submit it for publication in *Dairy, Food and Environmental Sanitation*. Maybe you don't author articles; do you know someone who does? Encourage them to contact IAMFES to publish their article – just another way that you can promote your Association.

Involvement also includes financial support. We are very fortunate to have a large number of Sustaining Members who support IAMFES through Membership, advertising and exhibiting at the Annual Meeting. Part of the Membership dues our Sustaining Members pay goes to support the IAMFES Foundation. All Members are welcome to contribute to the Foundation and your contribution is tax deductible (in the USA). I will expand more on how the IAMFES Foundation supports the mission of IAMFES in a future column, but I can assure you the monies are spent on worthwhile projects. Have you asked yourself, do I have $5 or $10 I could send to support Foundation activities? All contributions are welcome! Tax deductible contributions (in the USA again) can also be directed to general operations of IAMFES. None of our monies are used to lobby governmental policy or laws. Please consider monetary support of your Association.

I'm sure I wasn't able to list all ways you could help IAMFES in this short column, but I hope that this has stimulated your thoughts. Support from Members like you is the only way we can expect IAMFES to grow to meet the needs of more Members in the future. I thank you for your past support and we certainly look forward to your continued support of IAMFES!

THANK YOU!

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Dairy, Food and Environmental Sanitation, Vol. 17, No. 5, Pages 274-280

Environmental Analysis Methods Utilized to Determine the Contamination Sources in a Sausage Processing Plant

Susan N. Shumaker and Joellen M. Feirtag*

SUMMARY

Lactobacilli contamination was identified as the cause of spoilage of vacuum-packed cooked sausage from the processing plant studied. Visible manifestation of spoilage, formation of a milky-colored slime on the sausage skin and in the juice in the package, occurred 3 to 4 weeks after packaging. It was determined that the heat treatment administered at the sausage plant effectively eliminates the *Lactobacillus* isolates. Therefore, contamination occurred during postcook stages. A total of 38 lactobacilli isolates, based on carbohydrate fermentation patterns, were isolated and identified from raw product, the plant environment, steamer water used to cool product, and packaged product. The packaging environment and the steamer water were both identified as sources of contamination. Carbohydrate fermentation patterns of lactobacilli isolates in these areas and those in the spoiled, packaged product were similar. Microbiological and ATP-bioluminescence analyses of sanitation and assessments of process flow revealed lack of hygiene and process control resulting in postcook contamination.

INTRODUCTION

Lactic acid bacteria, more specifically lactobacilli, have been identified as the main cause of spoilage of many types of vacuum-packed cooked meat products from various manufacturers *(2, 5, 6, 7, 8, 9)*. The spoilage was most often observed as slime formation and atypical flavor *(5, 6, 7, 9, 11)*. Slimy spoilage occurs on the outside of the casing and may be seen in its early stages as discrete colonies which later coalesce to form a uniform layer of gray slime *(4)*. Korkeala et al. *(6)* determined that a lactobacilli count greater than 10^7 CFU per gram of sausage indicates that spoilage is beginning or the product has already spoiled. Spoilage problems cause financial loss to the processor because of disposal of product, loss of shelf space at the retailer, and loss of consumers.

Mol et al. *(12)* determined that homofermentative lactobacilli are the most important component of the microflora contaminating vacuum-packed sliced cooked meats. These organisms predomi-

nate and eventually spoil the product because they grow well at low temperatures, under anaerobic conditions, and in the presence of 3 to 5% NaCl. Additionally, lactobacilli are insensitive to the nitrite present in cured cooked meat products *(4)*.

Several studies indicate that spoilage lactobacilli are unable to survive the heat treatment commonly used for vacuum-packed cooked meat products *(5, 8, 9)*. Thus, the lactobacilli responsible for spoiling meat products originate from contamination after heat treatment. Raw materials, equipment, processing rooms, air, and employees all have been identified as postcook contamination sources *(2, 5, 8, 10, 11, 12)*. Airborne lactobacilli are thought to be the main contaminant during the chilling process *(8)*. Whereas, during packaging, the most likely sources of cooked meat contamination are the packaging equipment and the employees, Borch et al. *(2)* found that the level of cooked meat contamination increases as it proceeds through the processing stages. Therefore, the shelf life of the product decreases as it proceeds to each subsequent processing step.

An effective sanitation program is necessary to reduce or eliminate the incidence of spoilage organisms in vacuum-packed cooked meat products. Kempton and Bobier *(5)* recommended more frequent cleanups, especially in packaging rooms, because bacteria are continually transferred throughout the plant environment via employees, air, and equipment.

Assessing the efficiency and thoroughness of plant cleaning is a vital part of any quality control program *(16)*. ATP-bioluminescence is a rapid and effective method for monitoring plant hygiene *(3)*. ATP-bioluminescence hygiene monitoring systems are proactive tools used to evaluate and verify the cleanliness of the processing equipment and the facility by detecting adenosine triphosphate (ATP) arising from microorganisms and food residues, either of which indicates improper cleaning. The reaction of luciferin with the enzyme luciferase in the presence of ATP results in light emission directly proportional to the amount of ATP present, and thus the level of contamination.

The vacuum-packed cooked sausages produced at the sausage plant studied showed visible signs of spoilage. The intended shelf life of these products was 90 days; however, a milky colored slime formed in the package within 3 to 4 weeks. The spoilage was apparent in all types of product, occurred sporadically, and was not linked to a particular distributor or retailer. The purpose of this investigation was to determine the cause and sources of bacterial contamination of the vacuum-packed cooked sausages by various analytical methods.

MATERIALS AND METHODS

Sample collection

Environmental samples were collected throughout the processing areas (i.e. from equipment, walls, shower heads) using presterilized, calcium alginate swabs (Difco Laboratories, Detroit, MI). The processing areas included the grinding room, raw product production, smoke and steam cooking, cooling, holding, and packaging areas. A surface area of 10 cm^2 was swabbed, and the swab was immediately streaked onto MRS (Difco Laboratories, Detroit, MI) agar plates. The plates were incubated at 24°C for 48 h under anaerobic conditions using GasPak Plus (Becton Dickinson Microbiology Systems, Cockeysville, MD). Sampling was done on four different occasions over a 2-month period, and a total of 122 samples were collected.

Raw beef trimmings were aseptically collected in sterile plastic bags. A 50-g sample of meat trimmings was mixed with 50 ml of MRS broth and incubated at 24°C for 24 h. The sample was then streaked onto MRS agar plates, in duplicate, and incubated at 24°C for 48 h under anaerobic conditions.

Water samples from the two steamer showers were collected in sterile glass containers. One ml of each water sample was transferred to 9 ml of MRS broth and incubated anaerobically for 24 h at 24°C. The sample was streaked onto MRS agar plates, in duplicate, and incubated at 24°C for 48 h under anaerobic conditions. Sampling was done on four different occasions over a 2-month period, and a total of 24 samples were collected.

Samples were obtained from packaged product by collecting 1 ml of the juice found in the package. The juice sample was then transferred to 9 ml of MRS broth and incubated anaerobically for 24 h at 24°C. The sample was then streaked onto MRS agar plates, in duplicate, and incubated at 24°C for 48 h under anaerobic conditions. Fourteen packages were sampled. These included the following product types: beef wieners, beef ring bologna, Polish sausage, coarse ring bologna, old-fashioned wieners, regular style wieners, and knockwurst. In ten of the packages sampled, milky-colored slime had formed within 3 to 4 weeks of packaging. The other four samples were from four packages of product that had been packaged only one week prior to collection. Slime had not yet formed in these packages. These four packages were held at 44°C for 3 days and at 25°C for 4 days to accelerate spoilage. Milky-colored slime formed in these four packages after the temperature abuse.

TABLE 1. Lactobacilli isolation throughout the sausage processing plant and in spoiled packaged product as determined on MRS agar plates incubated at 24°C for 48 h

Sampling site	Number of samples[a]	No. positive for lactobacilli	Percent positive
Grinding room	8	7	87.5
Raw product area	20	11	55.0
Steamer shower	24	8	33.3
Cooling area	16	4	25.0
Holding room	10	4	40.0
Packaging area	61	25	41.0
Packaged product	14	14	100.0

[a] Total number of samples taken on four different days.

Morphological evaluation

The strains that were isolated from the samples were examined for Gram reaction, general morphology, and catalase production. The general key used for the identification was Bergey's Manual of Systematic Bacteriology *(15)*.

Carbohydrate fermentation pattern

The carbohydrate fermentation pattern of each isolate that was a gram-positive, catalase negative, rod or coccobacillus was determined by the API 50 CH test (bio Mérieux Vitek, Hazelwood, MO). The manufacturer's instructions were followed for the API 50 CHL medium. Cells were grown on MRS agar for 24 h at 24°C under anaerobic conditions and then harvested from an isolated colony with a sterile swab. API 50 CH strips were incubated anaerobically at 24°C and readings were taken at 24 and 48 h.

Effectiveness of heat treatment

A total of 40 sausages from four different stages of the sausage processing line were examined. On two different occasions, a random selection of 5 sausages each were aseptically collected into sterile plastic bags before smoke, after smoke, after steam, and before packaging. Each sausage was weighed, mixed with 50 ml of 0.1% peptone, and placed in a stomacher for 2 min. The samples were serially diluted 10-fold in 0.1% peptone solution. Aliquots of 0.1 ml from the dilutions were plated on MRS agar in duplicate. The plates were incubated anaerobically at 24°C. After 48 h, colonies were counted, and each colony type was examined for general morphology, Gram reaction, and catalase production.

Adenosine triphosphate hygiene monitoring assay

Hygiene assessment was done with the Biotrace® Uni-Lite™ Hygiene Monitoring (Biotrace® Inc., Plainsboro, NJ) system. The assay was carried out according to the manufacturer's instructions *(1)*. Sampling was done throughout the processing facility before and after cleaning and sanitation. On eight different occasions over a 3-month period. The swabs were read within 1 h of sampling. Any surface that gave a relative light unit (RLU) reading greater than three times the reagent control was considered unsatisfactory or unclean *(14)*.

Evaluation of process control

To evaluate process control, two test batches of old-fashioned wieners were followed through the process on two different days. The internal product temperature, processing room temperature, or the time the product remained at each process step was noted for each batch. Internal product temperature was determined with a temperature probe. Additionally, the sausage plant layout was assessed to identify areas for potential postcook contamination.

RESULTS

The occurrence of lactobacilli in raw product, environmental samples throughout the processing areas, and in spoiled packaged product is presented in Table 1. A total of 73 lactobacilli isolates from the plant were identified. Lactobacilli were found in 87.5% of the raw meat trimmings, 33.3% of the steamer shower water samples, in at least 40% of the samples from the raw product production, holding, and packaging areas, and in 100% of the spoiled packages of sausages.

The carbohydrate fermentation patterns of the 73 lactobacilli isolates revealed 38 different isolate profiles. Only six of the 38 profiles are presented (Table 2). All isolates within a profile reacted similary to all tests to which that particular profile was subjected. Twenty-four different isolate profiles were discovered in the raw product production area and the grinding room. Spoiled packaged product samples revealed six different lactobacilli isolate profiles. Eight different isolate profiles were found in the steamer water, cooling area, holding room, and packaging area.

TABLE 2. Carbohydrate fermentation patterns of the lactobacilli isolates from the packaging area and steamer shower water that matched isolates from spoiled packaged product

API 50 CHL system	Isolate profiles[a]					
	A	B	C	D	E	F
l-Arabinose	+	+	+	+	–	–
Ribose	+	+	+	+	–	+
Galactose	+	+	+	+	–	–
α-methyl-D-glucoside	–	–	+	–	+	+
Esculin	+	–	+	+	+	+
Cellobiose	+	–	–	–	+	–
Maltose	–	–	–	–	+	–
Melibiose	+	+	+	+	–	–
Trehalose	+	+	+	+	–	+
Gentiobiose	–	–	–	–	+	+
D-Turanose	–	–	+	–	+	+
Gluconate	+	+	+	+	–	+

[a]The following reactions were positive for all profiles: glucose, fructose, mannose, n-acetyl glucosamine, and sucrose. The following reactions were negative for all profiles: glycerol, erythritol, D-arabinose, D-xylose, L-xylose, ß-methyl-D-xyloside, sorbose, rhamnose, dulcitol, inositol, mannitol, sorbitol, α-methyl-D-mannoside, amygdalin, arbutin, salicin, lactose, inulin, melezitose, raffinose, starch, glycogen, xylitol, D-lyxose, D-tagatose, D-fucose, L-fucose, D-arabitol, L-arabitol, 2-ketogluconate, and 5-ketogluconate.

TABLE 3. Number of lactobacilli from sausages at four different stages of processing determined on MRS agar plates incubated at 24°C for 48 h

Process stage	Number of samples	Number of CFU/g of sausage	
		Test 1	Test 2
Before smoke	5	6.7×10^5	1.1×10^6
After smoke	5	< 1	< 1
After steam	5	< 1	< 1
Before packaging	5	< 1	< 1

Table 2 lists the carbohydrate fermentation patterns of the lactobacilli isolate profiles in spoiled packaged product and those isolates from the steamer shower water and packaging area that matched the isolates in spoiled packaged product. The other 32 isolate groups did not match profiles A to E and are not listed in Table 2. All isolates were gram-positive, catalase negative, rods or coccobacillus. Profile A consists of 3 isolates from spoiled packaged product. Profile B represents 3 isolates from spoiled packaged product and 1 isolate from the packaging area. Profile C is 1 isolate from spoiled packaged product. Profile D consists of 7 isolates from spoiled packaged product, 7 isolates from the packaging area, and 3 isolates from the steamer shower water. Profiles E and F each represent 1 isolate from spoiled packaged product. A package of beef wieners contained 2 different isolates represented by Profiles A and C. Two different isolates were also found in a package of old-fashioned wieners. These isolates fall into Profiles D and F.

The number of lactobacilli from sausage samples at four different stages of processing can be seen in Table 3. Before the sausage samples were smoked, the lactobacilli counts were 6.7×10^5 CFU/g of sausage and 1.1×10^6 CFU/g of sausage for test 1 and test 2, respectively. After the sausages were smoked, the lactobacilli were no longer detectable. Lactobacilli were also undetectable after the steam process and right before packaging. The heat treatment appeared to have eliminated the lactobacilli present on or within the sausages. It is important to note that the sausages had not come into contact with any packaging equipment at the "before packaging stage."

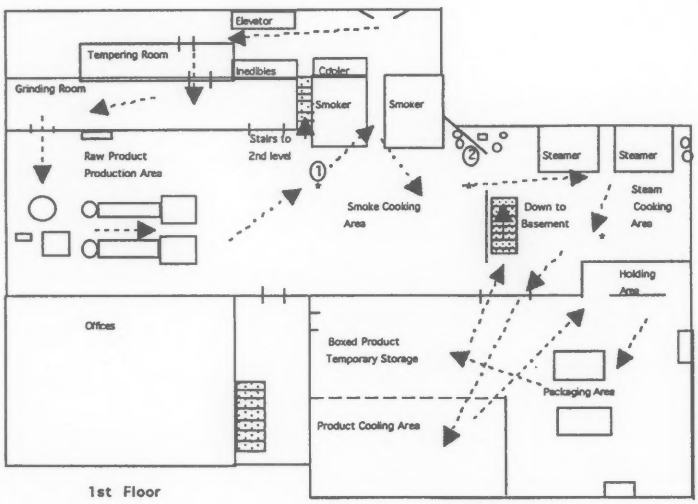
TABLE 4. Hygienic status of various processing areas determined with the Biotrace® Uni-Lite™ Hygiene Monitoring System

	Before production			During production			After sanitizing		
	# surfaces	# fail[a]	(%)	# surfaces	# fail	(%)	# surfaces	# fail	(%)
Raw product area	20	4	(20)	ND[b]	ND	-	12	6	(50)
Packaging area	30	15	(50)	62	29	(47)	40	22	(55)

[a]Any surface that gave a reading greater than three times the reagent control was considered unsatisfactory or unclean (i.e., failed).

[b]Not determined.

Figure 1. First floor layout of processing rooms at the sausage plant.



Arrows indicate direction of process flow.
* indicates an area where product is held for extended periods of time when the process is out of control.
① area where raw product is rinsed before entering the smokers.
② area where meat buckets used to transfer raw product are rinsed.

The hygienic status of various processing areas determined with the Biotrace® Uni-Lite™ Hygiene Monitoring System is shown in Table 4. The raw product production area was not sampled during production because it was assumed that the ATP levels may be high in this area because of somatic cells from meat trimmings. Before production, 80% of the surfaces tested in the raw product area and 50% of the surfaces in the packaging area were clean. After final cleanup and sanitizing, approximately 50% of the surfaces tested in the raw product and packaging areas were unclean.

Figure 1 is a diagram of the plant layout and process flow as indicated by the arrows. The results for the two test batches were similar. The test batches remained in the raw product production area, which was at 80°F, for approximately 2.5 h. The batches were smoked to an internal temperature of 180°F, which is much higher than their specified internal product temperature of 135°F. Once removed from the smoker, the test batches remained in the smoke cooking area for over 1 h. The product was then steamed to an internal temperature of 160°F, which is lower than their specified internal product temperature of 170°F. Once the batches were removed from the steamer, they remained in the steam cooking area for over an hour before they were transferred to the product cooling area. In the cooling area, the internal temperature of the sausages cooled to 40°F in approximately 7 h. Cooling took much longer than the desired 4 h because the product cooling room was at 60°F; therefore, the room temperature had to be lowered before the product temperature could be reduced to 40°F.

Several conditions or procedures were identified that increase the chances for postcook contamination (Figure 1). Cooked product, when removed from the smokers and the steamers, is exposed to the

open raw product area. The door between the packaging room and the steam cooking area opens into an area exposed to the raw product area. Transfer of product to the subsequent step results in employee traffic from the raw product area to the cooked product area. Before the raw product is transferred into the smokers, it is held in the smoke cooking area and sprayed with water to remove any debris on the skin of the sausage. During processing, buckets used to transfer raw meat product are also rinsed with water in the smoke cooking area. These practices are carried out near the cooked product and increase the chances for bacteria-containing aerosols to contaminate cooked product.

DISCUSSION

The results of this study show that the spoilage of vacuum-packed cooked sausage was caused by lactobacilli. Lactobacilli were isolated from all spoiled packages of sausage tested and throughout the processing environment.

At the plant studied, the cooking procedure for sausages was sufficient to eliminate the lactobacilli present on and within the raw meat product. Several studies indicate that spoilage lactobacilli are unable to survive the heat treatment commonly used for vacuum-packed cooked meat products *(5, 8, 9)*. Thus, the lactobacilli responsible for spoiling the meat products originate from contamination after heat treatment. Raw materials, equipment, processing rooms, air, and employees have all been identified as postcook contamination sources *(2, 5, 8, 10, 11, 12)*. Airborne lactobacilli are thought to be the main contaminant during the chilling process *(8)*. Whereas, during packaging, the most likely sources of contamination of the cooked meat products are the packaging equipment and the employees, Borch et al. *(2)* found that the level of contamination of the cooked meat product increases as it proceeds through the processing stages. Therefore, the shelf life of the product decreases as it proceeds to each subsequent processing step. These results were consistent with the results of other studies examining the effectiveness of heat treatments for cooked sausages *(8, 9)*. Therefore, it was assumed that the lactobacilli responsible for the spoilage had originated from postcook contamination.

Although lactobacilli were not detectable on the cooked sausage right before packaging, this does not ensure that the product will not spoil before the sell-by date. Kempton and Bobier *(5)* found that there is no relationship between total bacterial counts at the time of packaging and subsequent bacterial growth. After one week, product with very low counts at packaging can contain as many bacteria as those products with high counts at packaging. Furthermore, the sausage samples taken before packaging had not come into contact with the packaging equipment or been handled by employees. These subsequent steps are potential sources of postcook contamination.

Although 38 different lactobacilli isolate profiles based on carbohydrate fermentation patterns were identified, only 6 isolate profiles were prevalent in the spoiled packaged product. Comparison of carbohydrate fermentation patterns of the 38 lactobacilli isolate profiles revealed that isolates from equipment and physical structures in the packaging area and also from the steamer water used to cool the product matched the isolates found in packages of spoiled product. Thus, the packaging area and the steamer water were considered to be sources of lactobacilli contamination.

Despite the fact that the carbohydrate fermentation patterns of the lactobacilli isolates found in the meat trimmings and the raw product production area did not match the isolates from the spoiled packaged product, both are considered potential sources of contamination. The presence of lactobacilli in raw materials and raw product areas increases the chance for the spread of bacteria via air, equipment, and employees to other rooms *(10)*.

Lack of hygiene was observed at the plant. The hygiene monitoring assessment indicated that overall cleaning and sanitizing in the raw product area and packaging area were unsatisfactory; approximately 50% of the surfaces tested were unclean. Improper cleaning and sanitation may result in buildup of bacteria in the postcook processing rooms *(2)*. Plant sanitation plays an important role in determining the number of organisms present in the finished product, and therefore is a critical aspect of Good Manufacturing Practices.

Inadequate plant layout, inability to control times and temperatures at each step in the process, and limited amount of documentation all indicate lack of process control. The plant layout is conducive to postcook contamination because of the lack of a barrier between raw and cooked product areas. The initial lactobacilli counts of 6.7×10^5 CFU/g and 1.1×10^6 CFU/g of sausage for test 1 and test 2, respectively (Table 4) were quite high. This is probably caused by temperature abuse of raw product before the heat treatment. Lack of documentation limits the ability to determine if the process is in control and to track the product before it enters the plant and once it leaves.

In conclusion, lactobacilli caused spoiling of the vacuum-packed cooked sausages. The packaging area and the steamer shower water were determined to be the sources of contamination. To prevent postcook contamination

at this plant, improvement in Good Manufacturing Practices (GMPs) is necessary. This includes obtaining control over the process and improving sanitation. In many cases, avoidance of contamination or recontamination is simply a matter of applying GMPs during processing *(13)*. Also, implementation of a Hazard Analysis Critical Control Point (HACCP) program was recommended to provide process control and a safer product.

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Codex Milk Product Standards

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The words *Codex Alimentarius* are Latin, meaning food law or food code. This accurately describes the Codex Alimentarius, which is a collection of food standards developed and presented in a unified, codified manner, together with associated materials such as; Codes for Hygienic and Good Manufacturing Practices; recognized methods of analysis and sampling; and general principles and guidelines. The Codex Alimentarius contains standards for all the principal foods, whether processed, semi-processed or raw in the form that they reach the consumer.

Codex was developed as an international commission established in 1962 when two organizations, the Food and Agriculture Organization of the United Nations (FAO) and the World Health Organization (WHO), recognized the need for international standards to guide the world's growing food industry and to protect the health of consumers. The stated purpose of Codex Alimentarius is "... to guide and promote the elaboration and establishment of definitions and requirements for foods, to assist in their harmonization and, in doing so, to facilitate international trade."

The Codex Alimentarius is the product of the intergovernmental body known as the Codex Alimentarius Commission. Since 1962, the Codex Alimentarius Commission has been responsible for implementing the Joint FAO/WHO Food Standards Program. The objectives of this Program are to protect the health of consumers, to ensure fair practices in the food trade, and to coordinate all food standards work. The Codex Alimentarius Commission has a current membership of 153 member governments. Membership is open to all Member Nations and Associate Member Nations of FAO and/or WHO. In addition, observers from international scientific associations, food industries and trade commissions may attend sessions of the Commission and of its subsidiary bodies.

To industrialized countries, Codex has become the ultimate reference. "What does Codex say?" is a question often asked by food technologists, manufacturers, government officials, and consumer advocates as they ponder food-related matters. To developing countries, Codex is recognized as a ready-made set of standards and guidelines. Whether adopted into law entirely or simply used for reference, Codex standards provide consumer protection, and both domestic food producers and importers know that the requirements are accepted in international trade.

"The Codex Alimentarius is the Product of the Intergovernmental Body Known as the Codex Alimentarius Commission."

Today there is little doubt that Codex Alimentarius has had a great impact on the quality and safety of the world's food supply. Codex has helped to upgrade standards for food manufacturing, processing, safety and quality all over the world and has contributed to an increase in international food trade since 1962. However, until the completion of the Uruguay Rounds of the General Agreements on Tariffs and Trade (GATT) and the establishment of the World Trade Organization (WTO), Codex was little known outside of those actively involved in Codex. Since then, interest in the development of Codex standards has increased significantly.

In the GATT agreement, Codex standards are given a central position, and are standards that will be benchmarks used in trade dispute under the WTO. These agreements have given Codex Standards the teeth they did not have before as voluntary agreements. Henceforth,

compliance with Codex Standards can be the key to acceptance in international trade.

There are two basic types of committees. The first type comprises those Committees which deal with a general subject matter and work horizontally with all foods. There are eight in total and the primary tasks of these Committees are to endorse or review provisions in Codex standards falling within their field of competence; to develop major safety and health recommendations for the Commission based on the advise of scientific expert bodies; or to harmonize the presentation and information contained in Codex standards. In addition there are 17 commodity committees, each works in a vertical manner on the specific food or class of food allotted to them.

Many of the requirements contained in Codex Standards are similar to requirements affecting products in the United States. Some of these requirements are included in our Standards of Identity, while others are contained in regulations affecting labeling, additives, and contaminants. Just as these regulations dictate requirements for products marketed in the United States, Codex Standards provide requirements for products marketed internationally.

The Codex Committee on Milk and Milk Products is a vertical Commodity Committee and existed before there was a Codex Alimentarius Commission. It is the forerunner of all the food standards activities that have developed in recent years through Codex. This committee was originally known as the Joint FAO/WHO Committee of Government Experts on the Code of Principles concerning Milk and Milk Products and was established by FAO and WHO in 1958. In 1992, it became a subsidiary commodity committee entitled "The Codex Committee on Milk and Milk Products (CCMMP)."

The CCMMP has developed a Code of Principles for Milk and Milk Products, 13 general standards for dairy products such as butter, cheese, and milk powder, and 35 standards for individual cheese varieties.

Each new or revised Codex standard follows a prescribed eight step procedure. This procedure allows countries to review and comment on standards developed by Codex. This eight step procedure is as follows:

Step 1. The Commission or its Executive Committee decides that a standard should be elaborated, and which subsidiary body should undertake the work.

Step 2. The Secretariat arranges for the preparation of a "proposed draft standard."

Step 3. The proposed draft standard is sent to Members of the Commission and interested international organizations for comments.

Step 4. The Secretariat forwards the comments received to the appropriate subsidiary body to consider and amend the proposed draft standard.

Step 5. The Secretariat, after first review, may present text to the Commission as a "draft standard."

Step 6. If the Commission adopts the draft standard, it is sent by the Secretariat to all Members and interested international organizations for further comments, including implications on their economic interest.

Step 7. The Secretariat forwards the comments received to the appropriate subsidiary body to consider and amend the draft.

Step 8. The draft standard is submitted through the Secretariat to the Commission to adopt it as a "Codex Standard."

Once CCMMP became a subsidiary commodity committee of Codex, it was directed to review each milk and milk product standard and revise it to follow established Codex format. A Codex milk product standard includes the following information.

1. Scope
2. Description
3. Essential Composition and Quality Factors
   - Raw Materials
   - Permitted Ingredients
   - Composition
   - Heat Treatment
4. Food Additives
   - Only those food additives listed in the Annex (or, when adopted, the Codex Standard for Food Additives) may be used within the limits specified.
5. Contaminants
   - Heavy Metals
   - Pesticide Residues
6. Hygiene
   - To the extent possible, in good manufacturing practice, the product shall be free from objectionable matter.
   - When tested by appropriate methods of sampling and examination, the product:
     (a) shall be free from microorganisms in amounts which may represent a hazard to health;
     (b) shall be free from parasites which may represent a hazard to health; and
     (c) shall not contain any substance originating from microorganisms in amounts which may represent a hazard to health.
7. Labeling
   - Name of the Food
   - The name of the food shall be...
   - Labeling of Non-Retail Containers
   - Milk of Species other than the Cow
8. Methods of Sampling and Analysis

The CCMMP has held two sessions. The most recent session took place in May, 1996, at the FAO headquarters in Rome, Italy, and was hosted by the Government of New Zealand. Attendance totaled 203 delegates and observers, who were representing 55 countries and 5 international organizations. The 13 member delegation from the U.S. was made up of four government officials representing USDA and FDA. In addition, the Delegation included representatives from the International Dairy Foods

Association, the American Dairy Products Institute, the National Milk Producers Federation, the U.S. Dairy Export Council, and three individuals representing various dairy companies. The agenda for this meeting was comprised of the following topics:

Review of the code of principles concerning milk and milk products

Consideration of Standards at Step 7

Butter
Milkfat Products
Evaporated Milks
Sweetened Condensed Milks
Milk and Cream Powders
Cheese
Whey Cheese
Cheeses in Brine
Unripened Cheeses

Consideration of Standards at Step 3

Processed Cheese
Cream
Fermented Milk Products
Individual Cheese Standards

Consideration of Heat Treatment Definitions

Consideration of Nutritional and Quality Descriptors for Milk Products

Consideration of the Draft Code of Hygienic Practice for Uncured/Unripened Cheese and Ripened Soft Cheese

At this meeting, 9 general standards were discussed at the final review step. The Committee was able to complete its work on the Standards for Butter, Milkfat Products, Evaporated Milks, Sweetened Condensed Milks, and Milk and Cream Powders as well as the General Standards for Cheese, Whey Cheese, and Cheese in Brine. These standards were advanced to Step 8 of the Codex process and are awaiting adoption by the Codex Alimentarius Commission at its next meeting in June, 1997.

The Committee was not able to reach an agreement on the General Standard for Unripened Cheeses. This document was returned to Step 6 for redraft, and further discussion at the next session of the CCMMP. The reason this standard was not advanced was primarily the result of a request by the Italian Delegation to include Mozzarella cheese within its scope. Prior to this, the scope specifically excluded Mozzarella cheese. As a result of this request, the U.S. supported the retention of this standard for consideration at Step 6 during the third session.

Due to the extensive agenda, the process cheese, cream, fermented milk products and individual cheese standards were not discussed. These standards will be redrafted in light of consequential decisions made at the meeting and will be on the agenda for CCMMP's third session in 1998 for consideration at Step 3.

There are many issues to be decided on at the future meeting of the CCMMP. Some of the more critical issues facing the U.S. include:

The development of Codex standards for Mozzarella cheese.

New work was accepted at the second session of CCMMP to develop standards for Mozzarella cheese. Currently, the International Dairy Federation, the technical advisor to the CCMMP, is developing an initial draft for discussion during the 1998 session of CCMMP.

Restrictions placed on fat modified cheeses.

The Draft Code of Principles Concerning Milk and Milk Products contains provisions for milk products that are modified in composition beyond the limits specified in a Codex standard. An exclusion of these provisions is made for cheese. This exclusion would not permit the international marketing of fat modified cheeses that are defined under a current Codex standard unless specific provisions are made in that standard. At the second session of CCMMP, the U.S. expressed its concern with this exclusion. This issue is expected to be further discussed at the 1998 session of CCMMP.

Revision of the Hygiene section of all milk product standards to include a requirement for pasteurization or equivalent.

At the last session, the U.S. suggested that the following sentence be included into the Food Hygiene section of all milk and milk product standards: "Pasteurization or an equivalent measure approved by the official agency having jurisdiction, shall be used in order to achieve the appropriate level of public health protection." Significant opposition to mandatory pasteurization was voiced by several of the European Delegations. CCMMP agreed to refer the proposed modification to the Codex Committee on Food Hygiene for their consideration.

Revision of Process Cheese standards.

The U.S. is the world's largest producer of process cheese. The draft standard that was scheduled for discussion session did not adequately reflect product produced in the U.S. Because of the extensive agenda, the draft revised standard was not discussed. However, this draft revised standard is expected to be on the agenda for the next session of CCMMP.

U.S. dairy producers, manufacturers, and consumers have a great deal at stake in the development of international standards. Involvement in the process of establishing international standards is encouraged by Codex. Active participation by experts in international standards writing organizations will provide direction that will benefit the U.S. in international markets.

ABOUT THE AUTHOR

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Salmonella and Cantaloupes

Mark Tamplin

BACKGROUND

Melons are produced in a large number of domestic and foreign growing areas. As with most raw agricultural commodities produced in or on the soil, a small percentage will have human pathogens on their surfaces. In most cases, this has been considered natural and unavoidable. Human illness usually does not follow for several reasons. The natural biological barriers of intact fruit and vegetables protect them from microbial invasion. When these barriers are breached, illness causing organisms often do not compete favorably with spoilage organisms. Pathogens are sometimes removed with the pod, shell, peeling or rind, or are washed away in cleaning. Furthermore, any remaining organisms are prevented from growing to a level sufficient to cause illness by either refrigerated storage or cooking.

For several years, some melons have been treated with antimicrobials after leaving the farms. Some have been treated with wax. These treatments have been done to retard invasion by spoilage organisms, thereby extending shelf life. A significant number of producers, however, are field packing their melons for direct shipment. Field packed melons typically do not receive treatment to retard spoilage.

Once received at the retail level, food establishment whole melons traditionally have been required only to be in sound condition (not spoiled) and protected from contamination. Melons to be cut were to be cleaned using potable water and prepared using clean and sanitized utensils and surfaces.

Some food establishments obtain fresh melon products, such as melon chunks or fresh fruit mixes for salad bars or deli counters, from outside sources. These unfrozen products that are not "low-acid canned food" processed are received at retail level establishments either refrigerated or unrefrigerated.

With few exceptions, raw fruits and raw vegetables (including melons) have not been considered under the model codes to be potentially hazardous foods, i.e. foods for which time-temperature management is required to maintain their safety.

RELEVANT MODEL FOOD CODES PROVISIONS

2-101 specifies that... food shall be obtained from sources that comply with the applicable laws relating to food safety...

2-201 specifies that... food shall be protected from... agents of public health significance, and that the temperature of potentially hazardous food shall be 45°F (7°C) or below, or 140°F (60°C) or above, at all times.

2-402 specifies that raw fruits and raw vegetables that will be cut, combined with other ingredients or otherwise processed into food products shall be thoroughly cleaned with potable water before being used.

5-101 specifies that utensils and food-contact surfaces of equipment shall be cleaned and sanitized.

Note: Under the model codes, use of cleaners and antimicrobials is not required. (A produce brush may be useful in cleaning the outside of rough skinned melons with potable water.) However, the Code of Federal Regulations (21 CFR 173.315 Chemicals used in washing... fruits and vegetables) specifies the conditions under which chemicals may be safely used to wash or otherwise treat fruits and vegetables. Chemicals may be used provided that:

1. only substances specifically listed in the CFR for this purpose are applied, and
2. the use of these chemicals is followed by rinsing with potable water to remove to the extent possible, residues of the chemicals.

ILLNESS RELATED TO MELONS

FDA is aware of reports of five outbreaks of salmonellosis linked to melons during the past forty years. The first occurred in August 1950 in Minnesota and involved six persons in two families who had consumed *Salmonella* contaminated watermelon. Each family had purchased half of a watermelon from the same roadside stand on the same day. The second occurred in Massachusetts in June 1954 and involved 17 individuals in five families who consumed watermelon contaminated with *S. miami*. The

only connection they had in common was the purchase of sliced watermelon from the same supermarket. (Gayler, G.E., et al. (1955), An Outbreak of Salmonellosis Traced to Watermelon, Public Health Reports, 70, 311-313.)

The third outbreak occurred in June 1979 in Illinois where 18 individuals in seven families were stricken after eating watermelon contaminated with *S. oranienburg*. All 18 persons had eaten precut watermelon from the same supermarket. (Centers for Disease Control (1979), *Salmonella oranienburg* Gastroenteritis Associated with Consumption of Precut Watermelons – Illinois, MMWR 28, 522-523.)

These outbreaks, along with a few others involving plant (as opposed to animal derived) foods were mentioned and taken into consideration when FDA prepared a model codes interpretation on potentially hazardous foods in 1986. The discussion in the interpretation noted that the melon illnesses may have resulted from the use of contaminated utensils and concluded that, "Considering the vast amounts of food in the plant category which is both uncooked and barrier-breached, the aforementioned examples seem insignificant. The rare growth of infectious or toxigenic organisms in these foods simply does not justify designating uncooked, barrier-breached (plant) food as potentially hazardous." (Food and Drug Administration, Definitions - Potentially Hazardous Food, FDA Retail Food Protection Program Information Manual, 6-01-04, May 9, 1986.)

The fourth outbreak occurred from December 1989 to March 1990. This outbreak spanned at least 30 states and involved an estimated 25,000 persons. Two deaths were reported. Cantaloupes obtained from salad bars and contaminated with *S. chester* were implicated. (Ries, A. A., et. al. A Multistate Outbreak of *Salmonella chester* Linked to Imported Cantaloupe, Abstracts of the 1990 Interscience Conference on Antimicrobial Agents and Chemotherapy, p. 238, No. 915.)

In response to this outbreak, FDA conducted two surveys in fiscal years 1990 and 1991 through which it collected and analyzed melons from many growing areas in several countries. Most of the melons were found not to be contaminated with *Salmonella* bacteria. However, although *S. chester* was not found, other strains of *Salmonella* were found on some of the melons from several production areas.

The fifth outbreak occurred in June 1991 and is linked epidemiologically to *S. poona* contaminated cantaloupes. The initial cases identified involved persons who had obtained the cantaloupe from salad bars. Investigations and reporting are still ongoing, but hundreds of persons in more than one fourth of the states now appear to be involved.

FDA has initiated experiments to determine:

1. the reduction of the *Salmonella* population on the outside of cantaloupe when washed in potable water;
2. the reduction of the *Salmonella* population on the outside of cantaloupe when scrubbed with a cleaning solution then rinsed with water;
3. the conditions necessary for chlorine to effectively kill *Salmonella* on the outside of cantaloupe, i.e. time, concentration, etc.;
4. the kinetics of growth (time, temperature, inoculum size, etc.) on the edible portion of cantaloupe when *Salmonella* are inoculated on the edible portion of the wedges and when inoculated on the rind of the wedges then commingled simulating a salad bar situation.

DISCUSSION

Available information about the nature of raw fruits and raw vegetables along with what has been reported about the outbreaks involving melons, suggests that the focus of public health concern should not be directed toward whole intact melons. Rather, careful attention needs to be given to cleaning the melons at the time of cutting, using clean and sanitized utensils and surfaces to minimize contamination of edible portions, and immediately consuming, cold holding or discarding cut melon pieces.

FDA's interpretation on potentially hazardous food describes the protection provided by a plant food's biological structure as follows:

"Foods in the plant category, in their natural state, have not often been implicated in foodborne illness outbreaks attributable to rapid and progressive growth of infections or toxigenic organisms or the slower growth of C. botulinum. *Although most of these foods possess essential nutrients, in the raw (unprocessed) state they seem to possess a barrier which effectively prevents the entry and subsequent growth of microorganisms. The testae of seeds; the peels, husks, skins or rinds of fruits and vegetables; and the intact shell of nuts are such protective barriers. Even though plant products are often harvested with soil, moisture and natural flora on their surfaces; and have pH levels above 4.6 and* A_w *levels above 0.85, in the unprocessed state, they seem inherently resistant to microbial invasion."*

Two factors are mentioned in all of the outbreaks noted above. In each episode the melons were contaminated with some species of *Salmonella*. Furthermore, all reports mentioned melons which had been precut and held at unknown temperatures for some period of time at retail prior to being purchased and consumed.

FDA's potentially hazardous food, interpretation notes that the optimum water activity (A_w) level for *Salmonella* species is 0.99, and that fresh fruits and vegetables typically have a water activity (A_w) level of 0.97 - 0.99+. The minimum pH level for *Salmonella* growth is listed at 4.0; the optimum at 6.3. Melons are listed in the pH range from 5.2 to 6.7.

Most plant derived products supply the three nutrient groups necessary for the growth of microorganisms. The above outbreaks seem to affirm that barrier breached melons afford sufficient levels of all the nutrients necessary for rapid and progressive *Salmonella* growth.

It has not been a regulatory requirement nor customary practice to refrigerate melon segments at roadside stands and retail food establishments. It is known that proper refrigeration will control the growth of *Salmonella*. Therefore, it seems plausible that the melons implicated in these outbreaks were contaminated when cut and held at growth temperatures for times sufficient for development of *Salmonella* levels that caused illness.

In summary, it is not possible at this time to assure that all domestically produced and imported melons are free from human pathogens (including *Salmonella*) which are naturally occurring in the environment. The melon's natural biological structure can be expected to provide some protection against the invasion of foodborne illness organisms until this barrier is breached by slicing and cutting. Careful application of the model food codes provisions specifying cleaning of melons (to be cut) with potable water, and use of clean and sanitized utensils and surfaces can be expected to minimize the risk of contaminating cut melon surfaces. This combined with proper temperature or time management of the cut melon pieces until consumed will greatly reduce the likelihood of melons causing illness.

RECOMMENDATION

Based on the foregoing, it is FDA's opinion that melons, once cut, meet the model food codes criteria for a potentially hazardous food making cut melon subject to the codes' time/temperature requirements.

Therefore, under the model codes, fresh "cut melon" products received from off-premise sites shall be:

1. obtained only from regulated food sources, and
2. received at retail at 45°F (7°C) or below.

Melons to be cut in the food establishment shall be:

1. cleaned thoroughly using potable water;
2. prepared using clean and sanitized utensils and surfaces; and
3. held at 45°F (7°C) or below [or 140°F (60°C) or above] until sold or served, or individually marked and discarded after four hours.

ADVISE TO CONSUMERS

Although consumer practices are not covered by the model codes, advice provided to consumers by food regulatory officials should be consistent with what is being specified for food retailers inasmuch as the public health concerns and safeguards are the same. Consumers should be advised to keep cut melon slices and pieces in the refrigerator (or on ice in the case of a picnic, etc.) until consumed. Where this is not possible, cut 'melon should be thrown out after four hours. Whole melons should be cleaned thoroughly with tap water before cutting, and care should be taken to cut melons with clean utensils on clean surfaces. If space permits, it would be an added precaution to keep melons to be cut in the refrigerator prior to cutting.

ABOUT THE AUTHOR

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Korean Delegation Meets for Establishment of an IAMFES Affiliate

Dr. Robert Brackett meets with Korean IAMFES Members

IAMFES Vice President, Robert Brackett, recently traveled to Seoul, South Korea to meet with Korean IAMFES members to discuss the formation of an IAMFES Korean affiliate. Dr. Brackett reported that twenty Korean IAMFES members have committed their support to membership in a Korean affiliate. During the session Dr. Dong-Kwan Jeong presented comments regarding the value of and requirements for affiliate status in IAMFES. Dr. Brackett relayed greetings from the IAMFES Executive Board and pledged the Board's support of the efforts to form an IAMFES affiliate. In addition, he presented a short talk on the history and overview of IAMFES. The Korean members present then nominated and voted on temporary officers. Dr. Choong-Il Chung was elected President; Dr. Yoh Chang Yoon was elected Vice President; and Dr. Jeong was elected Secretary. The members then chose "IAMFES Korean Affiliate" as the tentative name for their affiliate and agreed to complete their constitution and bylaws required to become an affiliate.

The next step of becoming an affiliate, the group will need to send: a formal letter requesting acceptance as an affiliate; a copy of their constitution and bylaws; a list of officers; and a list of at least ten members who are IAMFES members. The Executive Board will review and vote on acceptance of the new affiliate after receipt of their information.

Dr. Brackett noted in his report that there is no food safety organization presently in Korea. The formation of this affiliate will provide a great opportunity for IAMFES and a Korean affiliate to provide cutting-edge food safety information to the country and region. He felt the Koreans were unquestionably committed to the formation of a strong affiliate and are among the most enthusiastic members he has seen. Notice of acceptance of the affiliate will be published in *DFES*.

IAMFES Annual Meetings

1997

July 6-9
Hyatt Regency Grand Cypress
Orlando, Florida

1998

August 16-19
Renaissance Nashville Hotel
Nashville, Tennessee

New Members

CANADA

W. Bruce McNab
O.M.A.F.R.A.
Guelph, Ontario

Donna Mc Quay
Horizon Poultry
Ayr, Ontario

Robert Meijer
Labplas Inc.
St. Mathieu de Beloeil, Quebec

Austin E. Reade
Innovacorp
Dartmouth, Nova Scotia

Sandra Turosky
Ambrosia Chocolate Ltd.
Georgetown, Ontario

Guy R. Vallee
William Neilson Ltd.
Halton Hills, Ontario

John H. Wilson
Good Humor – Breyers
Burlington, Ontario

Iain Wright
Ault Foods, Kitchener, Ontario

FRANCE

Brigitte Carpentier
CNEVA Lerpac
Maisons-Alfort, Cedex

KOREA

Kwang-Yup Kim
Chungbuk National University
Cheongju, Republic of Korea

Eua-Sook Nam
Animal Resources Research Center
Seoul

THE NETHERLANDS

F. H. M. Heijkers
Dept. of Military Health Care
Utrecht

Servé Notermans
National Inst. Public Health
& the Environment, Bilthoven

SPAIN

Alex Janssen
Private Laboratory
Montevideo, Uruguay

Enguidanos Rodrigo
Instituto De Agroquinica Y
Burjassot, Valencia

UNITED STATES

ALASKA

Bert Gore
State of Alaska, Palmer

CALIFORNIA

Margaret Schmit Barretto
Foodmaker Inc., San Diego

Darren Blass
Foodmaker Inc., San Diego

Margaret Burton
Foodmaker Inc., San Diego

Luis V. Castro
The Cheesecake Factory, Calabasas

Jose A. Gene
Laboratorio Microtec
San Jose, Costa Rica

Eric W. Helmick
E. W. Helmick Group, Santa Barbara

Jeffrey Nelken
UCLA – Extension, Woodland

Anna Pascuzzi
Cal Poly San Luis Obispo
San Luis Obispo

Shinya Sadamoto
Eiken Chemical Co. Ltd.
San Diego

Arleen B. Tibayan
Silliker Laboratories, Hayward

Mark Widder
Veg. Fresh Farms, Anaheim

COLORADO

Lynn R. Graves-Delmore
Colorado State University
Ft. Collins

FLORIDA

Sharon Grossman
T. G. Lee Foods (Dean Foods)
Orange City

Celia Strawn
Tropicana Products, Bradenton

Kathleen Ward
Florida Dept. of Health
Jacksonville

GEORGIA

Sandra Bishop
Continental Grain Co.
Gainesville

Elaine M. D'sa
University of Georgia, Athens

Kenneth C. Hancock
Snackmaster
Leesburg

ILLINOIS

Paulette A. Gardner
Sanisafe & Associates, Chicago

Ajaib Randhava
Xytel Corporation
Elk Grove Village

Ramesh B. Shah
Quest International
Hoffman Estates

KENTUCKY

Ed Cecil
KAMFES, Owensboro

LOUISIANA

Gurhan Ciftcioglu
Central Analytical Laboratories
Belle Chasse

MAINE

Ittai Harel
IDEXX, Westbrook

MASSACHUSETTS

Gerald Kelly
Herbert V. Shuster, Inc.
North Quincy

MINNESOTA

Lorna K. Girard
State of Minnesota, St. Paul

Olga Starakis
Freshcheck Inc., St. Paul

MISSOURI

Jeffrey A. Frank
Nabisco
St. Louis

Nijaz Karalic
Nabisco Corporation
St. Louis

Lenel Sulton, Jr.
Hershey Chocolate – St. Louis
St. Louis

OHIO

Thomas Edwards
Summit County Health Dept.
Stow

Benjamas Promsopone
Ohio State University
Columbus

Annette M. Tibbs
L. J. Minor
Cleveland

PENNSYLVANIA

Walter L. Cooper
3M, Media

TEXAS

Scott Andrews
City of Plano, Plano

Susan Britton Mayfield
Minh Food Corp., Pasadena

Kerry P. Hughes
Dod Vet Lab., Marion

WASHINGTON

Randy J. Meek
Ecolab, Orting

WISCONSIN

Dawn Amundson
Mid America Dairymen, Inc., Juda

Ted Bruesch
Lipha Tech, West Bend

Kristen B. Houck
Wisconsin Center for Dairy
Research, Madison

UpDates

Eriez Magnetics Announces Key Promotions

Eriez Magnetics has announced promotions in key product and customer service areas to better serve its customers.

In a newly created position, Michael Latimer will be responsible for training field sales representatives, internal personnel, and customers as Manager, Sales Development. Reporting to the National Sales Manager, Latimer will also continue to use his sales experience and extensive product knowledge to manage the *EriezXpress* next-day shipping program, as well as additional responsibilities geared toward developing sales for Eriez. He has been a member of the Eriez team since 1980, moving up the ranks from technical sales representative to his most recent position, Product Manager, Separation.

As the new Product Manager, Separation, David Heubel will be responsible for directing the sales and marketing efforts of the company's Magnetic Separation equipment. Since joining Eriez in 1990 as a Technical Sales Representative, Heubel has held positions in many different areas of the business, most recently as Assistant Product Manager, Separation. He will now report to the national Sales Manager.

Additionally, Alan Gedgaudas, Manager, Special Projects, will now report to the National Sales Manager. His expertise in the resource recovery and refuse reclamation markets have greatly influenced Eriez sales growth with the development of the Eddy Current Separator and Scrap Drum and Electromagnet products. Gedgaudas will continue to coordinate with the Separation group and the other product groups to further expand Eriez service.

As a sales intern, Jeff Kaveney completed a full range of training in the Eriez Central Test Lab, Order Department, each product sales group and various field assignments. This experience qualifies Kaveney for his new position as Technical Sales Representative, Separation, reporting to the Product Manager, Separation.

AMSA Names Program Coordinator

Thomas H. Powell, M.S., has been named to the new position of Program Coordinator of the American Meat Science Association (AMSA), according to AMSA Executive Director H. Kenneth Johnson. The appointment was effective January 6.

Powell's initial duties will include superintending the AMSA-sponsored Intercollegiate Meat Judging programs, beginning with the National Western in Denver. He will serve as Secretary to the Intercollegiate Meat Coaches Association, including maintaining the association's records and the contest rules and regulations. He also will coordinate the Meat Judging Workshop at the annual Reciprocal Meat Conference (RMC). Other duties will include managing the AMSA shortcourse program, coordination of AMSA-sponsored workshops and assisting in the management of the RMC activities. He also will be the AMSA liaison with the USDA's Standardization Branch on matters pertaining to meat judging.

Powell expects to receive his Ph.D. in animal science in May from Kansas State University. He earned his B.S. in animal science and M.S. in food science at the University of Tennessee, Knoxville.

The AMSA is a non-profit professional association representing meat and livestock industry scientific interests. Its members include more than 1,000 educators, students, emeritus faculty and meat industry professionals involved in teaching, extension, research and other industry endeavors. Sustaining members in related fields provide additional support for the organization and its activities.

Norman Named to Board of Overseers

William S. Norman, President and Chief Executive Officer of the Travel Industry Association of America has been named to the Board of Overseers of the Hospitality Industry Hall of Honor, according to Dr. Ronald A. Nykiel.

Norman, as President and CEO of the Travel Industry Association, joins William P. Fisher, President and CEO of the American Hotel & Motel Association, Michael B. Peceri, President of the International Hotel and Restaurant Association, and Herman Cain, President of the National Restaurant Association and the Board of Overseers. In addition, Eric Hilton, Vice Chairman of the Hilton Corporation, Richard Marriott, President, Host Marriott, Kemmons Wilson, Chairman Wilson Co.'s and founder of Holiday Inns, and Margie Stouffer Biggar, daughter of Vernon Stouffer are the inductee/family representa-

tives serving on the Board. Alan T. Stutts, Dean of the Conrad N. Hilton College at the University of Houston (home of the Hall of Honor) also serves on the Board.

The 1997 nominees will be announced later this spring. The 1997 Induction Ceremony is scheduled for Wednesday, October 8 in Houston.

SRC Vision Announces Appointment of New Vice President of Operations

SRC Vision, Inc., manufacturer of optical sorting systems, has appointed Russell Stocek as its new Vice President of Operations.

Stocek's experience is in manufacturing a wide variety of products utilizing machining and electronic processes. He most recently worked for American Passenger Rail Car Company in Chicago as Director of Manufacturing, producing stainless steel transit cars for Amtrak and Metra (Chicago). He previously worked with Peterbilt in Dallas and Nashville, as Division Manager of Manufacturing and Industrial Engineering, building custom 18-wheelers.

Stocek also has experience with Raytheon Missile Systems, Allis Chalmers, and Westinghouse.

Captive Plastics Adds Account Manager to the East Coast Sales Team

Captive Plastics has appointed W. Lee Jomant as an Account Manager for the East Coast Sales Team.

Mr. Jomant has been involved with the plastics industry for the past ten years, holding positions within sales and new business development for Bettix, Johnson Controls, and American National Can.

Captive Plastics, Inc. is a leading manufacturer of plastic packaging for the personal care, pharmaceutical, food, and chemical industries. Captive Plastics offers in-house engineering, tooling, molding, decorating and assembly of products.

Bob Constantino Named President of Waterbury Holdings

Bill Davis, CEO of Waterbury Holdings of Vermont announces the appointment of Bob Constantino to President of the Company. Bob will have full operational authority for all of the Waterbury Holdings companies.

Prior to joining Waterbury Holdings of Vermont, Bob was President of Avant Garde Foods and Executive Vice President of Norseland, Inc. He has served on the Board of Directors for the International Dairy Deli Association and was President of the New England Dairy Deli Association. Bob is a member of the California Cheese and Butter Association, National Deli Council, American Cheese Society and The American Institute of Wine and Food.

Pro-Tek Promotes Howard Millstein to Vice President Position

Pro-Tek Packaging Group has promoted Howard Millstein to Vice President. Mr. Millstein, a twenty year veteran of the packaging industry, has been with Pro-Tek since 1992.

Previously responsible for a thirteen-state western region, Mr. Millstein, based out of Pro-Tek's west coast facility, now has responsibility for development and service of national accounts. Mr. Millstein is a resident of Woodland Hills, California, near Los Angeles.

Osmonics Announces New General Manager for Operations in Upland

Osmonics, Inc. announced that Clifford "Bud" Frith has been appointed the new General Manager and Chief Operating Officer for Osmonics' operations in Upland, CA. Frith is currently General Manager and COO of Osmonics' operations in Livermore, CA and Bryan, TX and will continue in this role as well.

Frith became General Manager of the Livermore facility in 1996. His diverse career in contamination analysis and control spans 30 years and includes management roles at Anatel, Vaponics and Millipore. Millipore accomplished a successful start-up in laboratory and process ultrapure water applications under his leadership. Frith was founder and CEO of Anatel Corporation, an international leader for ultrapure water instrumentation.

Osmonics' Livermore operation, acquired in 1994, manufactures PORETICS® products, including track-etch micro-filtration membrane and related laboratory products. Osmonics' Upland organization, acquired in 1989, manufactures MACE™ products – a complete line of Teflon PTFE flow control components.

Novamann Wins Privatization of Ontario Government Laboratory

Novamann International Inc. of Mississauga, Ontario has completed the privatization of Ontario Ministry of Labour's Occupational Health Laboratory. After a detailed evaluation of proposals from interested parties for the acquisition of major assets of the laboratory, and provision of testing services to the Ministry, Novamann was selected as the preferred organization.

Under the terms of the deal, Novamann will provide occupational health testing services, and other related services to the Ministry of Labour. In addition, Novamann has hired many of the scientists, technologists, and hygienists from the former government run laboratory. By virtue of Novamann's existing expertise in occupational health testing combined with the additional staff and equipment acquired under this agreement, Novamann is able to provide the Ministry of Labour's inspection staff and industrial clients with a consistent and uninterrupted service. This enables the Ministry of Labour to continue its programs of ensuring the health and safety of Ontario's workforce.

Novamann has consolidated its occupational health services group into the newly acquired operation located on Resources Road in Etobicoke. By building upon the world-class reputation of the Ministry's laboratory, Novamann will build a "Centre of Excellence" in occupational health sciences, which will offer services nationally and internationally.

Kraft Foods Honor F&H Food Equipment Co. with Supplier Excellence Award

Kraft Foods, Inc. announced that F&H Food Equipment Co., Springfield, MO, has been selected as a winner of the Kraft Foods Rick Stuedemann Award for Supplier Excellence.

F&H Food Equipment Co. is a distributor of sanitary pumps, valves and fittings and has been a supplier to Kraft facilities since 1959.

"F&H continues to offer our plants added value year after year in terms of providing equipment that meets specialized needs, working with manufacturers on design improvements, achieving significant cost savings and delivering outstanding customer service," said Jeff Posner, Vice President of Purchasing for Kraft.

The Kraft Foods Rick Stuedemann Award for Supplier Excellence was established to recognize suppliers who share in the company's commitment to superior quality. The award, dedicated to the memory of Rick Stuedemann, former Kraft Foods Vice President of purchasing, is presented annually.

Recipients are chosen based on criteria including continuous improvement efforts, innovation, use of technology, and cost efficiency and effectiveness exhibited over the prior year. To be considered for the award, suppliers must have worked with Kraft's North American operations for at least one year.

Six suppliers received the award at a March 6 presentation. In addition to F&H Food Equipment Co., recipients included: Vanguard Distributors, Inc. (safety equipment); Firmenich, Inc. (flavorings); Jefferson Smurfit Corp. (paper labels); Southern Plastics, Inc. (plastic caps); and Prestage Farms (turkeys).

Leading European Dairy to Test Process for Producing Infant Formula Ingredients That More Closely Resemble Human Milk Proteins

Sepragen Corporation (Nasdaq: SPGNU, SPGNA, SPGNW) announced that it has licensed its Sepralac™ process to Ireland's Carbery Milk Products Ltd. for evaluation. The nonexclusive license will cover an accelerated evaluation period. Upon successful evaluation, the parties will immediately commence negotiations of a joint agreement with a view to imminent commercialization.

The Sepralac™ process uses the company's patented *radial flow* chromatography technology to separate dairy whey into its component proteins. The proteins can be used to prepare infant formula which more closely resembles the composition of human milk than currently available products as well as for functional applications for other beverages and food products.

Carbery Milk Products Ltd., a farmer owned cooperative based in Ballineen, is Ireland's largest producer and exporter of cheddar and low fat cheeses. The company processes an annual milk pool of over 320 million liters. Carbery is also at the forefront of technological innovation and pioneering research, installing the world's first commercial whey ultra-filtration and distillation plant. It is a large supplier of neutral spirits in Ireland and its Carbelac whey protein ingredients are established as a market leader.

Bain Capital to Acquire Walco International

Bain Capital, Inc. announced that it has agreed to acquire a majority interest in Walco International, Inc., the leading distributor of health products for food animals in the U.S. Certain members of Walco's management and of the Wall family will retain an equity interest in the Company and will continue to manage the business.

Walco distributes and markets approximately 12,000 animal health-care products to over 40,000 customers in the U.S. and Canada. Headquartered in Porterville, CA, Walco was founded in 1954 by F. Willard Wall, who died last September.

Bain Capital, Inc. is a Boston-based private equity investment firm founded in 1984, which focuses on value-oriented investments in the distribution, manufacturing, consumer products, retail and business services arenas.

Ecolab Inc. Supports Industry School-to-Work Initiative

The Educational Foundation of the National Restaurant Association announces Ecolab Inc.'s commitment to support the Hospitality Business Alliance.

The Hospitality Business Alliance was formed by The Educational Foundation, the National Restaurant Association, the American Hotel & Motel Association and its Educational Institute. Its objective is to spur support and involvement in school-to-work programs and other initiatives to build the hospitality industry's workforce, as well as enhance the industry's image as an exciting and rewarding career opportunity.

Ecolab's support will help the Hospitality Business Alliance address the critical issue of workforce development within the hospitality industry. The Hospitality Business Alliance's first initiative is to assist operators and educators in forming school-to-work partnerships. The Alliance will help build an infrastructure to support these partnerships, by bringing together the resources and expertise needed to build a bridge between the hospitality industry and the nation's educational system.

The Hospitality Business Alliance sponsorship is the latest example of how Ecolab Inc. is investing resources and attention in the foodservice market. Ecolab is also a sponsor of the Industry Council on Food Safety, a coalition formed by The Educational Foundation in 1993 and made up of foodservice operators, manufacturers, suppliers and associations, that are committed to food safety education.

Ecolab Inc. joins the H. J. Heinz Company Foundation, the International Foodservice Manufacturer's Association (IFMA) and The Coca-Cola Company in sponsoring the Hospitality Business Alliance.

Ramsey Technology Acquires Australian Company

Ramsey Technology, a division of Thermo Sentron, Inc., (ASE-TSR) announced that it has acquired substantially all of the assets of RCC Industrial Electronics Pty. Limited (RCCI). Based in Sydney, Australia, RCCI is a privately held manufacturer of in-motion checkweighers for the food and pharmaceutical industries.

Thermo Sentron, Inc. develops, manufactures and markets high-speed precision-weighing pharmaceutical, and other diverse industries. The company's products for the packaged-goods industry include checkweighers and metal detectors. Thermo Sentron is a public subsidiary of Thermedics, Inc., a Thermo Electron company.

Dr. Ron Usborne Honored with Science & Technology Award by the Canadian Meat Council

Dr. W. R. (Ron) Usborne, of Caravelle Foods, is the 1997 recipient of the Science & Technology Award, presented biannually by the Canadian Meat Council in recognition of outstanding technical contribution to the Canadian meat industry.

The award, presented at the recent Annual Conference of the Canadian Meat Council in Montreal, consists of a framed certificate and a $1,000 honorarium.

Dr. Usborne was recognized for his contribution to the advancement of meat science through cooperative projects with government and industry; published research on carcass evaluation, grading, meat processing and meat quality and safety; extensive efforts at technology transfer to producers, processors, consumers, and others through short courses, invited presentations and published articles; and service to the Expert Committee on Meat & Poultry Products, Canada Committee on Food, Ontario Meat Research Committee, Canadian Meat Science Association, Canadian Institute of Food Science & Technology, Canadian Meat Council, and others.

Dr. Usborne's industrial experience and contributions, particularly to his employer, and especially his leadership in promoting and implementing HACCP-based programs are also noteworthy.

Prior to joining Caravelle Foods in 1989, Dr. Usborne was Chair of the Food Science Department at the University of Guelph, where he spent 20 years as a lecturer and researcher in the Department of Animal & Poultry Science and Food Science.

At present Dr. Usborne is the Chair of the Technical Committee of the Canadian Meat Council.

IFT Announces 1997 Achievement Awards Recipients

Twelve prestigious food science and technology awards will be presented by the Institute of Food Technologists (IFT) to the following recipients:

H. C. Rudolf Heiss, Ph.D., Professor, Industrial Association of Food Technology and Packaging (Munich, Germany), will receive the Nicholas Appert Award for his contributions to the field of food technology.

The Babcock-Hart Award will be presented to Connie M. Weaver, Ph.D., Professor and Head, Dept. of Foods and Nutrition, Purdue University. This award honors an IFT member for contributions to food technology that result in improved public health through nutrition or more nutritious food.

Stephen S. Chang Award for Lipid or Flavor Science: John M. deMan, Ph.D., Professor Emeritus, Dept. of Food Science, University of Guelph, will be recognized for significant contributions to lipid science.

William V. Cruess Award: Faye M. Dong, Ph.D., Associate Professor, University of Washington, will be honored for excellence in teaching food science and technology.

Carl R. Fellers Award: Paul F. Hopper, Ph.D., Consultant and Adjunct Professor at Cornell University, will be lauded for raising the visibility of food science and technology through professional extracurricular activities.

Food Technology Industrial Achievement Award: Qualicon™, a subsidiary of E. I. du Pont de Nemours and Company, will be honored for developing the RiboPrinter™ Microbial Characterization System.

The Industrial Scientist Award will be presented to R. B. Sleeth, Ph.D., retired Vice President and Director of Research, Armour Swift-Eckrich. This award honors an industrial scientist who has made a major technical contribution to the advancement of the food industry.

Daniel Y. C. Fung, Ph.D., Dept. of Animal Science and Industry, Kansas State University, will receive the International Award for promoting the international exchange of ideas in food technology.

Eric A. Decker, Ph.D., University of Massachusetts, will receive the Samuel Cate Prescott Award. IFT recognizes an IFT member who is less than 36 years of age or has received his or her highest degree within the previous ten years and has demonstrated outstanding ability in food science and technology research.

Research and Development Award: Sudhir K. Sastry, Ph.D., Professor, Food, Agricultural and Biological Engineering Dept., The Ohio State University, will be honored for significant research and development contributions to the understanding of food science and technology.

Nell I. Mondy, Ph.D., Cornell University, will receive the Elizabeth Fleming Stier Award. It honors an IFT member for pursuit of humanitarian ideals and unselfish dedication that have resulted in significant contributions to the well-being of the food industry, academia, students, or the general public.

Calvert L. Willey Award: Walter L. Clark, Ph.D., Food Science and Nutrition Dept., Chapman University, will be lauded for demonstrating meritorious and imaginative service to IFT.

Singh Receives 1997 DFISA/FPEI Food Engineering Award

Dr. R. Paul Singh is the 1997 recipient of the DFISA/FPEI Award for a Distinguished Food Engineer. The award, which is sponsored by the Dairy & Food Industries Supply Association Foundation and the Food and Process Engineering Institute, a unit of ASAE, will be presented at DFISA's Annual Conference in Scottsdale, AZ.

Dr. Singh is a Professor of Food Engineering in the Department of Biological and Agricultural Engineering and the Department of Food Science and Technology at the University of California at Davis, CA. He is being recognized for his outstanding record of accomplishment in education, research, and service to the food engineering profession both at a national and international level. Dr. Singh's achievements include: international recognition as a leading educator in promoting the fundamental paradigms of food engineering education. Dr. Singh has authored or coauthored nine books, 25 book chapters, and more than 150 refereed scientific research papers. He has supervised more than 50 graduate students and inspired countless undergraduates and colleagues with his classes, workshops, and short courses throughout the world, which earned him recognition as recipient of the ASAE A. W. Farrell Young Educator Award; international recognition as a leading authority in food engineering research and technology. Dr. Singh's publications reflect a blend of theory and application of engineering principles to food processing in such areas as energy conservation, post harvest technology, freezing preservation, and time-temperature integrators for monitoring handling systems of perishable or frozen foods. He has

twice been recognized by the IFT as recipient of the IFT Samuel Cate Prescott Award for Research in 1982, and the IFT International Award in 1988; International recognition for service to the profession. Dr. Singh is Past Chair of the Food Engineering Division in both ASAE and IFT. He served ten years as Associate Editor for Transactions of the ASAE, and Coeditor of the *Journal of Food Process Engineering*, and on the editorial board of other journals. As a NATO Senior Guest Lecturer, Dr. Singh has organized several international conferences and workshops that he follows up with an informal newsletter that serves as a "who's who" in food engineering internationally. He is also recognized for his instrumental role in the development of food engineering programs internationally, such as the ESB in Portugal and others in India, Indonesia, and Latin America.

The DFISA Foundation/FPEI Food Engineering Award has been given biannually since 1972. Each prospective awardee is nominated by an industry associate. Beginning in 1997, the award will be given annually, on even numbered years to an Emerging Food Engineer; and on odd numbered years to a Distinguished Food Engineer.

Epitope Sues to Rescind A&W Acquisition

Epitope, Inc. announced that it has filed a lawsuit against the former owners of Andrew & Williamson Sales, Co. (A&W), alleging fraud and breach of contract in connection with A&W's distribution of frozen strawberries through the United States Department of Agriculture (USDA) school lunch program. The frozen strawberries sold by A&W are believed to have been associated with an outbreak of hepatitis A, a viral infection, among school children and teachers in several Michigan schools. The Centers for Disease Control and Prevention associated the outbreak with strawberries that were grown in Mexico and processed at the A&W plant in San Diego on three days in 1996: April 19 and May 7 and 8. A&W's former CEO certified on November 27, 1996, that the berries were grown in the United States. Epitope acquired A&W's stock on December 12, 1996.

Epitope is cooperating fully with federal and state regulatory agencies on a voluntary recall of the berries processed on April 19 and May 7 and 8, which were sent to school lunch programs in several states. In its lawsuit, which was filed in the United States District Court for the District of Oregon, Epitope seeks $20 million in actual and punitive damages and rescission of Epitope's purchase of A&W stock. Epitope alleges that the former owners of A&W defrauded Epitope in connection with the sale, violated federal and state securities laws and breached contractual warranties and representations by failing to disclose the false certification of the origin of the strawberries sold to the USDA; by certifying that A&W was in compliance with all applicable laws and regulations; that A&W was not subject to liability for any past or continuing violation of any law; and that the defendants knew of no conditions or liabilities that might have a material adverse effect on A&W's business or financial condition.

HFM Announces Availability of Conference Scholarships

The National Society for Healthcare Foodservice Management is offering its operator members over $53,000 in scholarship money to attend the 1997 HFM National Training conference, September 13-17 at Loews Ventana Canyon Resort, Tucson, AZ. The money is available through generous contributions of the Society's associate member companies.

Nineteen hundred ninety-seven HFM Educational Scholarship Sweepstakes: This program will provide 28 scholarships for operator members covering coach air fare and four nights at the conference including meal plan. Sponsors for this program are: Alliant/Dietary Products, Basic American Foods, Dinex International, General Mills, Little Charlies Entrees, Mott's Foodservice, and Nestles Clinical Nutrition.

Rich Products Education Alliance Sweepstakes Program will provide 10 more scholarships for airfare and four nights at the conference.

Needs Scholarships: Freshens Yogurt, Conagra Frozen Food Foodservice, and Traulsen are teaming up for another scholarship program to provide seven people airfare and four nights at Ventana Canyon. To apply for the needs scholarship, applicants must have been a member of HFM for at least three years, and write a 300 word essay on why they would personally benefit from the scholarship.

Finally, contributions totaling $11,200 made by associate members attending the 1996 conference at Boca Raton will provide airfare to Tucson for needy operator members. To apply for airfare scholarships, members must write a letter to HFM stating that the paid airfare would make the difference in their being able to attend the conference.

The National Society for Healthcare Foodservice Management is the only national society devoted exclusively to the independent healthcare foodservice manager. The society's mission is to be the recognized leader in providing advocacy, support and education to independent healthcare food and nutrition managers.

Industry**Products**

Difco Laboratories

Difco Expands Distribution for the EZ Coli™ Rapid Foodborne Detection System

Difco Laboratories EZ Coli Rapid Detection System for the identification of *E. coli* O157 in all food products is now available exclusively from Fisher Scientific in the United States. The system has recently received "Performance Tested" status by the AOAC Research Institute. This kit provides rapid, accurate detection of *E. coli* O157 in food products in less than 20 minutes following a 24-h enrichment of the sample.

The EZ Coli Rapid Detection System consists of two major components, EZ Coli Enrichment Broth and the EZ Coli Detector Tip. The EZ Coli Enrichment Broth is an exclusive single-step enrichment medium that is selective for *E. coli* O157 and other closely related gram-negative, lactose-fermenting microorganisms. It is formulated to optimize recovery with non-meat products, such as apple juice, as well as ground meat. It is available as a convenient, pre-mixed powder, requiring less preparation time; which minimizes the costs associated with media preparation. Also available is Novobiocin Antimicrobic Supplement which offers the correct concentration for convenient supplement addition.

The EZ Coli Detector Tip is a micro filament immunological assay in a convenient micropipette tip format. Built-in positive and negative color gauges ensure that each tip provides easy-to-interpret results.

The EZ Coli Rapid Pathogen Detection System requires no capital equipment and minimal training. The detection system contains tips, pre-filters, reagents, and culture medium for sixty tests and has a shelf-life of twelve months.

Difco Laboratories, Detroit, MI

Reader Service No. 264

Magnetic Filter Funnel Now Available in 500 mL Size

Gelman Sciences new 500 mL Magnetic Filter Funnel provides a larger funnel capacity over the existing 150 and 300 mL sizes, which means less pouring of large samples. And, the new polyphenylsulfone construction results in a more durable and chemically resistant funnel.

The Magnetic Filter Funnel incorporates Gelman Sciences patented design for vacuum filtration, which utilizes a dual magnet connection for easy, one-hand operation. The funnel can be used repeatedly, and is both autoclavable and UV sterilizable. A forceps access point provides convenient retrieval of the membrane filter.

Designed for the vacuum filtration of liquids, the Magnetic Filter Funnel can be operated on a filter funnel manifold or sidearm flask. It is ideal for the analysis of particulate and microbial contamination using the Membrane Filter Technique.

Busy microbiology laboratories, such as those of beverage producers and water treatment facilities, find the Magnetic Filter Funnel particularly useful, as do chemists filtering reagents or measuring impurities in process fluids. The 500 mL funnel has an effective filtration area of 13.1 cm^2 with a 41 mm effective diameter.

Gelman Sciences, Ann Arbor, MI

Reader Service No. 265

Sepragen Launches Seprasorb® Chromatography Media for Biopharmaceutical Industry

Sepragen Corporation, which develops and manufactures advanced, high-throughput separation and purification systems, announced the launch of its patented SepraSorb® chromatography media at the BioEast Conference in Washington, D.C. The

Company also announced the filing of a patent for SepraDebitt, a new process to debitter orange juice and grapefruit juice.

SepraSorb, a novel "sponge-based" media is specifically designed to isolate proteins from crude feedstock. The new chromatography technology will make the purification and isolation of drugs by the biopharmaceutical industry less costly and improve overall yields. SepraSorb has a unique pore structure that allows crude stock to be directly applied to it without having to first go through the frequently time-consuming and product diminishing "clarification" process. SepraSorb's innovative sponge-like morphology allows cell debris to flow right through the matrix while absorbing the specific proteins of interest.

Sepragen is currently performing scale-up and economic studies on SepraDebitt and plans to introduce it to potential customers later this spring for evaluation. The commercial path is expected to follow that adopted for SepraLac®, the Company's dairy protein separation process.

Sepragen Corporation, Hayward, CA

Reader Service No. 266

3M Petrifilm Yeast and Mold Count Plate Receives AOAC Official Methods of Analysis Approval

3M Petrifilm Yeast and Mold Count plates have been approved by AOAC International as an Official Method (AOAC® Official Method℠ 997.02, Yeast and Mold Counts in Foods–Dry Rehydratable Film Method), giving food processors a simple, efficient and approved microbial testing method for detecting foodborne yeast and mold.

The AOAC Official Method approval recognizes the efficacy of Petrifilm Yeast and Mold Count plates as compared to standard pour plates. Approval is based on the results of a collaborative, comparative study of six food products by 18 laboratories.

Like all 3M Petrifilm plates, sample-ready Petrifilm Yeast and Mold Count plates provide accurate counts in just three steps; inoculate, incubate, and read. A built-in grid and an indicator dye makes counting colonies easy and consistent. Labor savings gained by using Petrifilm plates give processors more time to focus on other crucial tasks, such as monitoring critical control points or implementing HACCP programs.

3M Petrifilm products cover most microbial testing needs, including plates for testing aerobic bacteria, coliforms, *E. coli*, *Enterobacteriaceae*, and yeast and mold.

3M Microbiology, St. Paul, MN

Reader Service No. 267

bioMérieux Vitek, Inc.

The miniVidas®: A Compact, Automated, Immunoanalysis System for Food Microbiology

The miniVIDAS® from bioMérieux Vitek is a fully-automated pathogen screening system that uses Enzyme Linked Fluorescent Assay (ELFA) technology to achieve rapid, reliable and economic results for food microbiology testing.

The miniVIDAS can test for: *Salmonella*, *E. coli* O157, *Listeria*, *Listeria monocytogenes*, *Campylobacter* and Staphylococcal entertoxins A, B, C1, C2, C3, D and E in a variety of food products. Following enrichment protocols, results are typically available in 45 min.

The system allows for simultaneous processing of different assays and contains two, six-test sections for maximal throughput. The automated system uses a solid phase receptacle (SPR) that serves as an antigen capture and a pipetting device as well as a reagent strip that contains all necessary reagents in a ready-to-use format. This original test design eliminates constraints usually associated with manual reagent distribution. No precision pipetting is required and no internal pump tubing is used. This closed reagent/sample system ensures technologist and laboratory safety.

Ready-to-use reagents are inserted into the system. Two independent sections, each containing six test positions, enable different miniVIDAS parameters to be processed simultaneously. The integrated bar code reader identifies the reagents automatically. Samples are identified by bar code or by keying in the data. The system controls all assay operations to completion, results are printed automatically.

bioMérieuxVitek, Inc., Hazelwood, MO

Reader Service No. 268

Whatman LabSales Digital and Dial Thermometers

Whatman LabSales recently added to its product line digital and dial thermometers designed specifically for use in food preparation. Two digital models are available with temperature ranges of -40 to 300°F and a third model

offers an extended temperature range of -50 to 550°F. The digital models also feature rugged construction, auto power-off, a data hold to freeze readings on a large, easy-to-read LCD display. The dial thermometer features a 1 3/4" dial face and 8" stem, so it is perfect for checking milk temperatures in lattes and hot chocolate. The temperature ranges from 0 to 220°F plus, it features a sturdy clip that securely fastens to cups or pitchers. These new thermometers are the easiest to use and most affordable of their kind and are available through Whatman LabSales.

Whatman LabSales Inc., Hillsboro, OR

Reader Service No. 269

New High Temperature Triflouropropylmethyl Polysiloxane Bonded GC Column Available from J&W Scientific

J&W Scientific, has released DB™-200–a high-polarity stationary phase, well suited for a host of environmental and industrial chemical applications including pesticides, herbicides, substituted benzenes, solvents and Freons®. This new phase offers a higher temperature limit than its counterpart, DB-210.

Triflouropropyl substituted polysiloxane stationary phases offer a unique selectivity which has been used in combination with mid-polarity diphenyl substituted stationary phases for confirmational analyses. In some cases, the triflouropropyl phases have become the primary column of choice. J&W has created DB-200 with 35% triflouropropyl substitution which provides a 60°C higher temperature limit (300°C/320°C) and less bleed than its 50% triflouropropyl counterpart DB-210, but with selectivity identical to Rtx-200. DB-200 is solvent rinsable and available in a wide range of configurations.

J&W Scientific offers chromatographers the highest level of column-to-column reproducibility and cutting-edge capillary GC technology.

J&W Scientific Inc., Folsom, CA

Reader Service No. 270

Spirol Biotech

Spiral Biotech Excels with Autoplate® 4000

With the Autoplate® 4000 spiral plater, Spiral Biotech continues to excel in bringing microbiologists a tool that saves time and materials when plating samples onto media. To further automate enumeration, we offer two counting systems that integrate a scanner, software and stand-alone computer to accurately count colonies on spiral, pour, and spread plates. The CASBA™ 4 system reads a broad range of colony sizes, on opaque and transparent media, as well as PetriFilms™. The CASBA II system uses a focused laser beam to detect colonies and automatic thresholding results in high throughput. Both counters work with our bar code control system, which enables the user to enter the plate I.D. automatically by scanning a bar code, saving time and improving accuracy.

Spiral Biotech, Bethesda, MD

Reader Service No. 271

New, All-Natural Drain Cleaner is Easily Metered

A new liquid drain and trap cleaner that can be metered to restaurant and institutional plumbing systems using low-cost, programmable pumps has been introduced by Bioscience, Inc. MICROCAT®-GEL drain cleaner is a liquid blend of natural bacteria, enzymes and surfactants that removes deposits of fats and other materials to prevent blockages, odors and frequent physical clean-outs. A new sister product, MICROCAT-ST drain, trap and septic tank activator, is available in powder form for smaller nonmetered applications.

Both products meet all federal, state and local requirements and may be used in municipalities which have regulations against harsh chemical drain and trap cleaning products. The natural enzymes and surfactants clean and deodorize the plumbing system, while naturally-occurring bacteria in the formulation provide long-lasting activity to keep it free-flowing.

MICROCAT-GEL is sold in 2.5 gallon and 5 gallon drums. Large restaurants require a dosage of about 2 gallons per month, metered into the drain system when water flow is minimal.

Bioscience, Inc., Bethlehem, PA

Reader Service No. 272

New Filter Housing Turns Heads

Osmonics has introduced a new economical line of single-round stainless steel filter housings which accommodate 222 O-ring fin-adapters cartridge filters. The 316 stainless steel housing head uses the filter's 222 O-ring to secure an integral seal. The filter is held snugly in place to assure the filtrate will not be contaminated through particle by-pass.

Membrana™ "HX-222" housings are ideal for the filtration of submicron particles for any industrial application that requires high-efficiency, submicron particle filtration. The versatile single-round housings hold 10-inch or 20-inch nominal length filters and are available in 304 and 316 stainless steel. To simplify filter replacements, the housings employ a V-band clamp closure. Inlet and outlet ports are standard 3/4-inch FNPT.

Osmonics, Minnetonka, MN

Reader Service No. 273

Biothane Corporation North American Licensee for Aminodan

Biothane Corporation is the exclusive North American licensee for the Aminodan product recovery and process water purification technology. The Aminodan system, which was developed by The Aminodan Group in Skagen, Denmark, recovers proteins, fats and oils from food processing plant process water for reuse as animal feed. The recovery of salable materials from process water result in an up to 80% reduction in BOD and up to 99% reduction in fats, oils and suspended solids. The Aminodan system is especially suitable for, but not limited to, purification of dairy, meat and fish processing plant process water.

The recovery of salable products from wastewater, low system operating cost, reduced rendering cost due to lower moisture content of recovered product, and reduced municipal surcharges, result in favorable payback periods. Therefore, the Aminodan system is a self-financing concept which adds to a company's bottom line. More than 130 Aminodan systems have been installed worldwide.

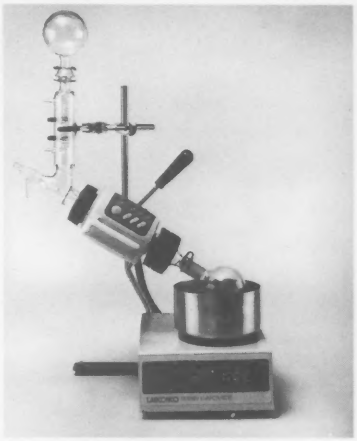
Biothane Corporation, Camden, NJ

Reader Service No. 274

Labconco Presents the Only Micro Rotary Evaporator Made in the USA

Labconco Corporation is pleased to introduce the new Micro Rotary Evaporator, which is the only Micro Rotary Evaporator made in the USA.

Easy to use controls on a soft-touch key pad are located up front and high, for easy accessibility and to prevent risk of splash from solvent spills or the bath. A digital LED display permits monitoring of rotation speed, bath actual, and set temperatures. The sparkless, high torque motor is belt driven and



Labconco Corporation

rotates glassware from 0-250 rpm. The lift is manually controlled by loosening a knob to raise or lower. The compact base is only 9 3/8" wide and 12 3/8" deep.

The bath is constructed of stainless steel; bath temperatures range from ambient to 100°C. A safety limiter turns the bath off automatically if it should run dry.

The glassware is positioned up front for easy accessibility. The dual-purpose condenser permits standard or reflux distillation. An inlet feeding tube allows continuous feeding of larger amounts of solution to the evaporating flask, and can be used to break vacuum. Flasks from 50-250 ml capacity can be used for receiving and evaporating liquids. A pivot control allows for different size flasks to be positioned at particular angles. All wetted parts of the Micro Rotary Evaporator are Teflon or glass.

Labconco Corporation, Kansas City, MO

Reader Service No. 275

BusinessExchange

Services/Products

ANNOUNCING!

In-Line Business Exchange Advertisements are now available in the Business Exchange Section of *Dairy, Food and Environmental Sanitation.*

85¢ per word

Bold and capitalized words are charged as two words. Area code and phone number count as one word. All in-line business exchange ads must be paid in advance. $20.00 per ad minimum charge.

For more information on how your organization may utilize these ads, call Rick McAtee, IAMFES Advertising/Exhibits Manager at (800) 369-6337 or (515) 276-3344.

Jenny N. Scott

Scott Elected Secretary

Robert Tiffin, Chairperson of the IAMFES Teller's Committee has announced that Jenny Scott was elected Incoming Secretary of the Association. Ms. Scott will take office following the Awards Banquet at the 1997 Annual Meeting and will succeed through Chairs, serving as the Association's President in 2000-2001.

Virginia (Jenny) Scott began her career as a Research Specialist for the Food Research Institute at the University of Wisconsin before joining the National Food Processors Association (NFPA) as a Senior Microbiologist in 1980. During her sixteen years with NFPA she has held several positions including her recent promotion to Senior Director, Office of Food Safety Programs.

As Senior Director, Jenny assists in the coordination of food safety issues at NFPA, including legislative, regulatory and international aspects. She also provides expertise in microbiology, HACCP, ISO 9000, risk assessment and other areas to NFPA members and staff as well as serves as Staff Secretary to the Microbiology and Food Safety Committee.

Jenny is an active member of IAMFES and has participated on the Program Advisory Committee and the Nominating Committee. She continues to be involved with the Meat Safety and Quality Professional Development Group, Risk Assessment Professional Development Group, and has convened sessions at IAMFES Annual Meetings. Other affiliations are with the Institute of Food Technologists, American Society for Food Microbiology, Association of Official Analytical Chemists, U.S. Delegation of the Codex Committee on Food Hygiene and the International Life Sciences Institute's (ILSI) Committee on Food Microbiology.

Throughout her career Jenny has shown dedication to her profession and has been honored with various awards including the 1987 Bill Williams Award for Scientific Excellence presented by Campbell Soup Company, Institute of Food Technologists Scientific Lecturer 1990-1992, and American Society for Microbiology Lecturer 1991-1992.

Jenny received her undergraduate degree in biology/psychology from Wellesley College. She received a master of science in bacteriology from the University of Wisconsin and a master of science in food science from the University of Maryland. She is currently working on her doctorate in food science at the University of Maryland.

PRELIMINARY PROGRAM

of the IAMFES 84th Annual Meeting

Monday Morning—July 7, 1997

Opening Doors to New Dairy Markets

- New Product Opportunities, What are Consumers Seeking?—CHRISTINE BRUHN, University of California, Davis, CA
- Moo Kooler—Breaking New Ground—DAVID STIEFER, Milk Marketing, Inc., Strongsville, OH
- Square Pegs in Round Holes—SCOTTIE MAYFIELD, Mayfield Dairy Farms, Inc., Athens, TN
- How do IDF, Codex and Trade Agreements Impact the Dairy Farmer?—DUANE SPOMER, USDA, Washington, D.C.
- Some Implications of the Dairy Portions of the Farm Bill—RICHARD MCKEE, USDA, Washington, D.C.

Technical Session—Foodborne Pathogens

- Effects of Culture Temperature, Inoculum Concentration, and Contact Time on Attachment of *E. coli* O157:H7 and *L. monocytogenes* to Chicken Skin—R. DANIELLE BENEFIELD, and D. Conner, Auburn University, Auburn, AL
- Factors Affecting Inhibitory Activity of Lactates Against *E. coli* O157:H7 at 10°C—DONALD CONNER and K. Tamblyn, Auburn University, Auburn, AL
- A Sensitive 24-h Vero Cell Tissue Culture Assay for Cytotoxins of EHEC O157:H7 Strains—RAMAKRISHNA NANNAPANENI, R. Story, and M. Johnson, University of Arkansas, Fayetteville, AR
- Stimulation of Growth and Survival of *E. coli* O157:H7 at Suboptimal Temperatures by Sodium Lactate—KATHERINE TAMBLYN and D. Conner, Auburn University, Auburn, AL
- A Small Outbreak of Listeriosis Linked to the Consumption of Imitation Crab Meat—JEFFREY FARBER, E. Daley, M. Mackie, and B. Limerick, Health Canada, Ottawa, Ontario, Canada
- Thermal Destruction of *L. innocua* in Ground Beef Patties with 5, 25 or 50% Fat—JAMES GOFF, M. Christie, R. Story, and M. Johnson, University of Arkansas, Fayetteville, AR
- Accelerated Recovery on Injured *Salmonella* through Media Modification—JOSEPH BAILEY, M. Myszewski, and N. Cox, USDA-ARS-RRC-PMSRU, Athens, GA
- *Salmonella* Control in Poultry—NELSON COX, J. Bailey, N. Stern, and J. Line, USDA-ARS-RRC-PMSRU, Athens, GA
- Factors Affecting Growth and Toxin Production by *Clostridium botulinum* in Peanut Spread—M. ROCELLE CLAVERO, R. Brackett, L. Beuchat, and M. Doyle, University of Georgia, Griffin, GA
- Response to Acid Challenge by *Yersinia enterocolitica* Depends on Physiological State and Strain—ROBERT MERKER, F. Khambaty, and D. Shah, FDA, Washington, D.C.
- A Quantitative Risk Assessment of *Vibrio vulnificus* in Gulf of Mexico Oysters Consumed in Canada—EWEN TODD, S. Stavric, W. Ross, and B. Buchanan, Banting Research Centre, Ottawa, Ontario, Canada

Quantitative Microbial Risk Assessment

- Risk Assessment: A Means of Linking HACCP and Public Health—ROBERT BUCHANAN, USDA-ARS-ERRC, Wyndmoor, PA
- Estimation of Distribution of Numbers of Organisms in Raw Product—HARRY MARKS, USDA, Washington, D.C.
- Growth and Inactivation Models to be Used in Quantitative Risk Assessments—SUZANNE VAN GERWEN, Wageningen Agricultural University, Wageningen, The Netherlands

- Dose Response Modeling–DAVID VOSE, David Vose Risk Analysis Services, Wincanton, United Kingdom
- Simulation Modeling–Monte Carlo Techniques–MICHAEL CASSIN, Decisionanalysis Risk Consultants, Guelph, Ontario, Canada
- Risk Assessment and Economic Analysis for Managing Risk–ROBERTA MORALES, North Carolina State University, Raleigh, NC

Special Poster Session—Washing Makes a Difference (Posters without authors will be displayed until Tuesday at noon)

- Update of Washing and Sanitizing of Milk Haulers and Dairy Plant Equipment–TOM BOWMAN, FDA, Atlanta, GA
- An Assessment of the Cleaning and Disinfection of Poultry Transport Containers and Truck Beds–SAM JOSEPH, University of Maryland, College Park, MD
- Efficacy of Holding Pen Washing to Reduce Bacterial Levels–KATHLEEN RAJKOWSKI, USDA-ARS-ERRC, Wyndmoor, PA
- New Methods for Sanitization of Egg Shells–S. D. WORLEY, Auburn University, Auburn, AL
- Biofilms in Aquatic Food Processing–DOUGLAS MARSHALL, Mississippi State University, Mississippi State, MS
- Washing Fresh Fruits and Vegetables–JERRY BARTZ, University of Florida, Gainesville, FL

Safety of Refrigerated Foods—An Update

- Refrigerated Food Safety: Regulatory Perspective–THOMAS SCHWARZ, FDA, Washington, D.C.
- Refrigerated Food Safety: Industry Perspective–DONALD ZINK, Nestle, USA, Inc., Glendale, CA
- Packaging Refrigerated Foods–E. JEFFERY RHODEHAMEL, Cryovac North America, Duncan, SC
- Antimicrobial Strategies for Refrigerated Foods–ERIC JOHNSON, University of Wisconsin-Madison, Madison, WI
- Intervention Strategies of Minimally Processed Refrigerated Foods–ROBERT BRACKETT, University of Georgia, Griffin, GA
- Predictive Microbiology in Formulating Safe Refrigerated Foods–MARTIN COLE, Nabisco Biscuit Company, East Hanover, NJ

Poster Session—Methodology

- A New Rapid Automated Method for the Detection of *Listeria* spp. from Environmental Swabs–RUTH FIRSTENBERG-EDEN and L. Shelef, MicroSys, Inc., Ann Arbor, MI
- Development of a New Medium to Assess Injury in Heat & Sanitizer Injury for *Listeria*–MISTY VANDERBUSH and N. Sullivan, Difco Laboratories, Inc., Ann Arbor, MI
- Suitability of Selective Media for Recovery and Enumeration of Sublethally Heat-and Acid-Injured *L. monocytogenes*–ROBERT WILLIAMS and D. Golden, University of Tennessee, Knoxville, TN
- Identification and Enumeration of *Salmonella* on Sample Slides of Poultry Carcass Wash Water Using Image Analysis–JINPING HUANG, Y. Li, M. Slavik, and G. Bayyari, University of Arkansas, Fayetteville, AR
- Evaluation of an Automated Enzyme-Linked Fluorescence Immunoassay (ELFA) for the Detection of *Salmonella*–MELVINA KEITH, Ross Products Divison of Abbott Labs, Columbus, OH
- Antibody-Direct Epifluorescent Filter Technique (Ab-DEFT) for Rapid, Specific Enumeration of *Listeria* in Food–DIANA STEWART and M. Tortorello, FDA-NCFST, Summit-Argo, IL
- Quantitative Screening of Reactivity of *Bacillus* and *Clostridium* Spores in a Dot-Blot Immunoassay–NANCY STANLEY, J. Quinlan, and P. Foegeding, North Carolina State University, Raleigh, NC
- Detection of *Staphylococcus aureus* Using an Enhanced Chemiluminescent Biosensor–PHILIP PIVARNIK, J. Sperry, C. Brown, S. Letcher, A. Senecal, and A. Rand, University of Rhode Island, W. Kingston, RI
- Multiplex PCR for the Detection of Human Enteroviruses, Hepatitis A Virus, and Norwalk Virus–SORAYA ROSENFIELD and L. Jaykus, North Carolina State University, Raleigh, NC
- Modification of the Sample Preparation Protocol in the BAX™ System for Screening *Salmonella* to Permit Detection of Food Matrices with Inhibitory PCR Effects–CHERYL SOBITIES, G. Tice, L. Ecret, and E. Cole, Qualicon, Wilmington, DE
- Rapid Molecular Method for the Detection of *Salmonella* spp. Using PCR and LCR–SORAYA ROSENFIELD and L. Jaykus, North Carolina State University, Raleigh, NC
- Rapid Detection of *Salmonella* in Feces from Dairy Cows Using a Fluorescent PCR-Based Assay–ANNA PASCUZZI, S. McCulloch, J. Tuttle, and R. Cano, California Polytechnic State University, San Luis Obispo, CA
- Results of Testing a Variety of Foods for *Salmonella* Using a Fluorogenic PCR-Based Assay–LISA YAGI, M. Matsuura, R. Green, S. Kawasaki, B. Kimura, S. Flood, E. Schreiber, and C. Paszko-Kolva, PE Applied Biosystems, Foster City, CA
- Evaluation of an Enzyme-Linked Immunosorbent Assay, Direct Immunofluorescent Filter Technique and Multiplex PCR for Detection of *E. coli* O157:H7 in Beef Carcass Wash–PINA FRATAMICO and T. Strobaugh, Jr., USDA-ARS-ERRC, Wyndmoor, PA
- Development of PCR-Based Homogeneous Confirmative Assays for *L. monocytogenes* and *E. coli* O157:H7 –BARBARA KRIEGER, W. Barbour, and C. Sobities, Qualicon, Wilmington, DE

- Development and Evaluation of a PCR-Based Assay for the Detection of *L. monocytogenes* in Foods–MARK BARBOUR, B. Andaloro, M. Jensen, G. Tice, W. Hudson, C. McGuire, J. Hazel, and A. Stoltzfus, Qualicon™, Wilmington, DE
- Concentration of Pathogenic Microorganisms from Dairy Products for Detection of PCR–LISA LUCORE and L. Jaykus, North Carolina State University, Raleigh, NC
- Rapid Methods for Identification of Lactic Acid Bacteria–SUSAN FREUND, M. Tamplin, H. Trenk, and C. Wei, University of Florida, Gainesville, FL
- Genetic Characterization of *Shewanella putrefaciens* and *Pseudomonas* spp. Isolated from Fish Processing and Spoilage Using Automated Ribotyping–AMY MCCARDELL, S. Gudmundsdottir, B. Gudbjornsdottir, and H. Einarsson, Qualicon™, Wilmington, DE
- Comparison of Excision Versus Swabbing Techniques for Assessing the Bacteriological Quality of Pig Carcass Surfaces–PATRICIA KLEIN, S. Palumbo, and A. Miller, USDA-ARS-ERRC, Wyndmoor, PA
- A Novel Technique for *E. coli* Testing of Beef and Pork Carcasses–J. ERDMANN, J. Dickson, and M. Grant, Iowa State University, Ames, IA
- A 24 h Test for Enumeration of Total Coliforms and *E. coli* in Food–ROBIN IRVING, C. Smith, A. Naqui, and D. Townsend, IDEXX Laboratories, Inc., Westbrook, ME
- The Occurrence of Non-Coliform Bacteria on VRBA–CHOONG CHUNG and E. Norm, KonKuk University, Kwangjin, Seoul, Korea
- Evaluation of a Novel Method for the Detection of *Staphylococcus aureus* in Dairy Samples–JILL GEBLER, Murray Gouldburn Co-operative Co., Ltd., Yarram, Victoria, Australia
- The Evaluation of an Automated Rapid Microbial Detection System for Sterility Testing of an Aseptically Processed Tomato-Based Vegetable Beverage–Y. JENNIFER LEE and L. Kanen, Amway Corporation, Ada, MI
- SimPlate™ for Yeast and Mold: A New Method for Rapid Fungi Enumeration in Food–CHUN-MING CHEN, H. Gu, D. Townsend, and A. Naqui, IDEXX Laboratories, Inc., Westbrook, ME

Monday Afternoon—July 7, 1997

Fresh-Cut Fruits—Pitfalls and Challenges for the Future

- An Introduction to Fresh-Cut Fruits Market Potential in Both the Foodservice and Retail Arenas–EDITH GARRETT, IFPA, Alexandria, VA
- Factors Affecting the Suitability of Commodity Fruits Headed for the Fresh-Cut Processor–ADEL KADER, University of California-Davis, Davis, CA
- Processing and Quality Factors Affecting the Quality and Storage Life of Fresh-Cut Processor–DEVON ZAGORY, Devon Zagory and Associates, Davis, CA
- Fruit Spoilage–BILL CONWAY, USDA-ARS, Beltsville, MD
- Microbiological Safety and Control of Fresh-Cut Fruits–JEFFREY FARBER, Health Canada, Ottawa, Ontario, Canada

Technical Session—Methodology and Education

- Comparison of *Staphylococcus aureus* Detection by Conventional and New Petrifilm™ Methods–PATRICK MACH, C. Binsfeld, H. Lubrant, and L. Pederson, 3M Microbiology Products, St. Paul, MN
- A Single Test Unit for Quantitating Coliforms, *E. coli* and *Salmonella* in Waters and Foods–ROBERT SALTER, E. Zomer, and M. Gandman, Charm Sciences, Inc., Malden, MA
- Ensuring the Microbiological Quality of a Low Proof Beverage–GORDON WHITNEY, J. Montgomery, K. Smith, and E. Vaughn, Brown-Forman Beverages, Louisville, KY
- Assessing Surface Cleanliness-An Integrated Approach Using ATP Bioluminescence and Microbiological Analysis–CRAIG DAVIDSON, C. Griffith, A. Peters, and L. Fielding, University of Wales Institute, Cardiff, Wales, United Kingdom
- The Use of Bioluminescence for Evaluating Plant Cleanliness in a Baking Facility–REBECCA ILLSLEY, E. Jackson, K. McRae, and J. Feirtag, University of Minnesota, St. Paul, MN
- Rapid Molecular Method for Detection of Human Enteric Viruses in Prepared Hamburgers and Leaf Lettuce–PARIS LEGGITT and L. Jaykus, North Carolina State University, Raleigh, NC
- Immunomagnetic Separation and Flow Cytometry for Rapid Detection of *E. coli* O157:H7–KUNHO SEO, R. Brackett, and J. Frank, University of Georgia, Griffin, GA
- Hazard Analysis Critical Control Point (HACCP) Implementation of Food-service Directors–ELIZABETH BARRETT, Kansas State University, Manhattan, KS
- Handwashing vs. Gloving for Food Protection–MICHAEL DOLAN, E. Fendler, and R. Williams, GOJO Industries, Inc., Cuyahoga Falls, OH
- Foodborne Disease in the Home–ELIZABETH SCOTT, Newton, MA
- Statewide Training for Environmental Health Specialist–BIBBY MOORE, Div. Environmental Health, Raleigh, NC
- Recipe HACCP–O. PETER SNYDER, JR., Hospitality Institute of Technology and Management, St. Paul, MN

USDA "Mega-Reg" Microbiological Requirements

- Microbiological Sampling and Testing Aspects of the "Mega-Reg"–GARY ACUFF, Texas A & M University, College Station, TX
- *E. coli* Testing and Process Control–MIKE ROBACH, Continental Grain Company, Gainesville, GA
- *E. coli* and *Salmonella* Levels on Beef Carcasses–Survey Results Compared to Mega-Reg Requirements–JOHN SOFOS, Colorado State University, Fort Collins, CO
- The Importance of the Feedback Loop in HACCP: The Consumer Perspective–CAROLINE SMITH-DEWAAL, Center for Science in the Public Interest, Washington, D.C.
- International Perspective of the "Mega-Reg" Microbiological Testing Requirements–PETER MILLER, Australian Embassy, Washington, D.C.
- Microbiological Performance Standards and HACCP–DANE BERNARD, NFPA, Washington, D.C.

Food Allergies and Intolerances

- Medical Aspects of Food Allergies and Intolerance–ROBERT K. BUSH, University of Wisconsin, Madison, WI
- Food Allergy: Scope, Risk and Severity Issues–SUSAN HEFLE, University of Nebraska, Lincoln, NE
- Assessing the Potential Allergenicity of New Food Pathogens–STEVE GENDEL, U.S. FDA, Summit, IL
- The Consumer Perspective on Food Allergy–ANN MUNOZ-FURLONG, The Food Allergy Network, Fairfax, VA
- Food Allergy: Food Industry Risk Management–LYDIA MIDNESS, General Mills, Inc., Minneapolis, MN
- Food Allergy: The Regulatory Perspective–JANICE OLIVER, FDA-CFSAN, Washington, D.C.

Poster Session—General Food Microbiology

- Biological Properties of a Bacteriocin-Like Inhibitory Substance Produced by a Newly Isolated *Bacillus subtilis*–GUOLU ZHENG and M. Slavik, University of Arkansas, Fayetteville, AR
- Use of HPLC to Demonstrate Aflatoxin B_1 Degradation by *Flavobacterium aurantiacum* in Corn–LALIT BOHRA, S. Reuger, R. Phebus, J. Smith, and D. Grieger, Kansas State University, Manhattan, KS
- Occurrence of Molds and Levels of Aflatoxins and Fumonisins in Venezuelan Corn–R.M. RAYBAUDI and A. Martínez, Universidad Central de Venezuela, Caracas, Venezuela
- Enumeration and Characterization of *Aeromonas* sp. in Vegetable Products from Venezuela–R.V. DÍAZ, A. Martínez, R. Raybaudi, D. Brión, C. Rodriguez, and R. Oritz, Universidad Central de Venezuela, Caracas, Venezuela
- Inhibition of Microbial Growth and Toxin Production in Honey–HASSAN GOURAMA, S. Doores, K. Barlow, and G. Holcomb, Penn State University, Reading, PA
- Effect of Diet on the Indicative and Pathogenic Microbiological Quality of Aquacultured Pacu (*Piaractus mesopotamicus*)–SHARMA PULLELA, C. Fernandes, G. Flick, G. Libey, S. Smith, and C. Coale, Virginia Tech, Blacksburg, VA
- Antibiotic Resistant Bacteria in Aquacultured Catfish Fillets–CUSTY FERNANDES, G. Flick, J. Silva, and T. McCaskey, Virginia Tech, Blacksburg, VA
- Effect of Production System on the Indicative and Pathogenic Microbiological Quality of Aquacultured Finfish–SHARMA PULLELA, D. Fernandes, G. Flick, G. Libey, S. Smith, and C. Coale, Virginia Tech, Blacksburg, VA
- Effects of Vitamin E Supplementation and High vs. Low Initial Microbial Loads on Retail Display Life of Beef Muscle–HENRY ZERBY, K. Belk, J. Sofos, G. Smith, and L. McDowell, Colorado State University, Fort Collins, CO
- Rapid Catalytic Activity Method for Measurement of End-Point Temperature in Cooked Beef and Sausage–CARL DAVIS and S. Cyrus, USDA-ARS-RRC, Athens, GA
- Shelf-Life of Ground Beef Patties Treated by Gamma Irradiation–WILLIAM ROBERTS and J. Weese, Auburn University, Auburn, AL
- Sensory Changes of Irradiated Ground Beef through Six Weeks of Storage–JEAN WEESE, J. Johnson, and W. Roberts, Auburn University, Auburn, AL
- The Effect of Growth Medium and Heating Menstruum on Heat Resistance of *Pediococcus* sp.–BASSAM ANNOUS and M. Kozempel, USDA-ARS-ERRC, Wyndmoor, PA
- Evaluation of Changes in Microbial Populations on Beef Carcasses Resulting from Steam Pasteurization–TED BROWN, R. Phebus, P. Peters, and A. Nutsch, Kansas State University, Manhattan, KS
- Comparison of Methods for Beef Carcass Decontamination–ALEJANDRO CASTILLO, L. Lucia, K. Goodson, and G. Acuff, Texas A & M University, College Station, TX
- Efficacy of Trisodium Phosphate for Destruction of *Salmonella* on Cantaloupe–AUBREY MENDONCA and D. Fultz, North Carolina A & T State University, Greensboro, NC
- Growth and Adherence on Stainless Steel by *Enterococcus faecium*–NELIO ANDRADE, D. Ajao, and E. Zottola, University of Minnesota, St. Paul, MN
- Scanning Electron Microscopy of High Density Polyethylene Conveyor Surfaces during Normal Processing in Meat Plant Operations–RICK KANE, P. Hildebrant, G. Braun, and J. Fiertag, University of Minnesota, St. Paul, MN

- Delamination in Polyethylene Structures and the Influence of Multilayered Upper Surfaces on Deterioration Processes–RICK KANE, P. Hildebrant, P. Wjotas, and J. Feirtag, University of Minnesota, St. Paul, MN
- Microbial Spoilage of Chub-Packed Ground Beef from Four Processing Plants in the United States–SHANTINI GAMAGE, P. Peters, L. Kerwin, R. Phebus, and J. Luchansky, Food Research Institute, Madison, WI
- Simulation of *Bacillus* Spoilage in a Model Food System–MARISA CAIPO, M. Llaudes, and D. Schaffner, Rutgers University, New Brunswick, NJ
- Development of an Experimental Model for Microbial Cross-Contamination and Evaluation of the Efficiency of an Antibacterial Kitchen Disinfectant–TONG ZHAO, P. Zhao, M. Doyle, and J. Rubino, University of Georgia, Griffin, GA
- Efficacy of Three Sanitizers Against Food Spoilage Bacteria–ALEXANDER VON HOLY and D. Lindsay, University of the Witwatersrand, Wits, Johannesburg, South Africa
- Bacterial Populations of Different Sample Types from Poultry–IFIGENIA GEORNARAS, A. de Jesus, E. van Zyl, and A. von Holy
- Microbial Ecology of South African Retail Sorghum Beer–ALEXANDER VON HOLY, T. Pattison, and I. Geornaras, University of Witwatersrand, Wits, Johannesburg, South Africa
- Microbiological Quality of Cream-Fillings from Doughnuts Sold at Bulawayo, a Zimbabwean City–RICHARD OKAGBUE, Applied Biology & Biochemistry Dept., Bulawayo, Zimbabwe
- Microbial Quality of Koshari, One of the Most Famous Floksy Meals Common in Egypt–USAMA ABDUL-RAOUF and M. Ammar, Al-Azhar University, Assuit, Egypt

Tuesday Morning—July 8, 1997

Ensuring Proper Equipment Design

- World Issues and Organizations Involved in Equipment Design and Standards Harmonization–JOHN HOLAH, Campden & Chorleywood Food Research Association, Chipping Campden, Glos, United Kingdom
- The Meaning of the 3-A Symbol–WARREN CLARK JR., American Dairy Products Institute, Chicago, IL
- Regulatory and Inspection Bodies Involved–A Panel Discussion–ROCKLYN BATES, USDA, Ag Marketing Service, Washington, D.C.
- Regulatory and Inspection Bodies Involved–A Panel Discussion–STEVE SIMS, FDA, Washington, D.C.
- Regulatory and Inspection Bodies Involved–A Panel Discussion–DAN RACKLEY, Oklahoma State Dept. of Health, Muskogee, OK
- Interested Parties: Is the System Working? A Panel Discussion–RICHARD SMITH, Elmhurst, IL
- Interested Parties: Is the System Working? A Panel Discussion–VINCE MILLS, Evergreen Packaging, Cedar Rapids, IA

Technical Session—General Food Microbiology

- A Risk Assessment for *Salmonella enteritidis* in Eggs in Canada–EWEN TODD, W. Ross, T. Gleeson, K. McIntyre, P. Sockett, R. Irwin, A. Muckle, C. Poppe, J. D'Aoust, and R. Medaglia, Banting Research Centre, Ottawa, Ontario, Canada
- Verification of a Quantitative Risk Assessment for *E. coli* O157:H7 in Hamburgers–EWEN TODD, W. Ross, M. Cassin, A. Lammerding, and R. Khakhria, Banting Research Centre, Ottawa, Ontario, Canada
- Rapid Desiccation with Heat in Combination with Water Washing for Reducing Bacteria on Beef Carcass Surfaces–CATHERINE CUTTER, W. Dorsa, and G. Siragusa, USDA-ARS-Roman L. Hruska, Clay Center, NE
- A Purge Sampling Method to Detect Total Aerobic Bacteria and *E. coli* O157:H7 in Raw Beef Combos–WARREN DORSA and G. Siragusa, USDA-ARS-Roman L. Hruska, Clay Center, NE
- Evaluation of the USDA Sponge Sampling Technique for Beef Carcasses for Enumeration of *E. coli*–NAHED KOTROLA, J. Kotrola, R. Phebus, J. Marsden, and C. Kastner, Kansas State University, Manhattan, KS
- Reductions in Microbial Populations at Five Anatomical Locations on Steam Pasteurized Beef Carcasses–ABBEY NUTSCH, R. Phebus, J. Kotrola, T. Brown, M. Riemann, and R. Wilson, Kansas State University, Manhattan, KS
- Characterization of Lactic Acid Bacteria from a Sow, a Healthy Piglet and an Ill Piglet–BECKY PETERSON, A. Piva, and J. Luchansky, University of Wisconsin-Madison, Madison, WI
- Thermotolerance of *Enterobacter sakazakii* in an HTST Pasteurizer–MARIA NAZAROWEC-WHITE, R. McKellar, and P. Punidadas, Agriculture and Agri-Food Canada, Ottawa, Ontario, Canada
- Reducing Conditions and Seryl and Sulfhydryl Inhibitors on Aflatoxin B_1 Degradation by *F. aurantiacum*–DORIS D'SOUZA and R. Brackett, University of Georgia, Griffin, GA
- Effect of Prebiotics on *Bifidobacterium*–SHU-JEAN TSAI and J. Luchansky, University of Wisconsin-Madison, Madison, WI

Safety of Genetically Modified Foods

- Genetic Modification of Proteins in Foods–PETER DAY, Rutgers, New Brunswick, NJ
- The Safety of Genetically Modified Foods–The Issues in Perspective–PAT SANDERS, Monsanto Corp., Chesterfield, MO

- Evaluating the Safety of Novel Foods–STEVE GENDEL, U.S. FDA Center for Food Safety and Technology, Summit, IL
- Novel Foods–Consumer Response: Who Sees Benefits, Who is Concerned, How Can We Communicate? CHRISTINE BRUHN, University of CA Center for Consumer Research, Davis, CA
- Changes in Nutritional Content and Bioavailability of Nutrients in Bioengineered or Novel Foods–Myth or Fact?–BARBARA PETERSEN, Novigen Sciences, Inc., Washington, D.C.
- Genetic Modification of Foods–*Codex Alimentarius* Issues and Perspective–H. MICHAEL WEHR, National Milk Producers Federation, Arlington, VA
- Effective Communication of the Safety of Novel Food Biotechnologies and Genetically Modified Organisms–DOUG POWELL, University of Guelph, Guelph, Ontario, Canada

International Trends in Microbiological Methods

- Laboratory Accreditation: Is It Needed and Can It be Standardized?–RUSSELL FLOWERS, Silliker Laboratories, Inc., Homewood, IL
- International Efforts to Standardize Microbiological Methods–PAUL TEUFEL, Federal Institute for Health Protection of Consumers and Veterinary Medicine, Berlin, Germany
- Tolerance Limits and Methodology: Effect on International Trade–JEFF BANKS, Campden and Chorleywood Food Research Association, Chipping Campden, United Kingdom
- How to Design a Comprehensive Validation Program: Association of Official Analytical Chemists (AOAC)–WALLACE ANDREWS, U.S. FDA, Center for Food Safety and Applied Nutrition, Washington, D.C.
- MicroVal, A Challenging Project (Validation and Certification of Alternative Methods for Microbiological Analysis of Food, Animal Feeding Stuffs, and Beverages)–IRENE RENTENAAR, Dutch Standards, Institute, Delft, The Netherlands

Cyclospora—The Parasite that Raspberries Made Famous

- Epidemiology of the Outbreak–BARBARA HERWALD, Centers for Disease Control, Atlanta, GA
- Tracebacks–Untangling the Maze–STEVE OSTROFF, Centers for Disease Control, Atlanta, GA
- Microbiology and Testing of Cyclospora–JOSEPH MADDEN, FDA, Washington, D.C.
- Ontario Experience and Response to Cyclospora Ontario Infection,1996–CHARLES LEBER, Ontario Ministry of Health, North York, Ontario, Canada
- Cyclospora–FDA Regulatory Aspects–JANICE OLIVER, FDA, Washington, D.C.
- Environmental Assessment in Guatemala–FRANK BRYAN, Food Safety Consultation and Training, Lithonia, GA

Poster Session—Foodborne Pathogens

- Survival of *L. monocytogenes* in Refrigerator Dill Pickles–MARK HARRISON, J. Harrison, and R. Rose, University of Georgia, Athens, GA
- Fate of Gamma Irradiated *L. monocytogenes* on Raw or Cooked Turkey Breast Meat during Refrigerated Storage–DONALD THAYER, G. Boyd, J. Fox, Jr., H. Farrell, Jr., A. Kim, K. Snipes, and S. Edelson, USDA-ARS-ERRC, Wyndmoor, PA
- Effectiveness of Two Cooking Systems in Destroying *E. coli* O157:H7 and *L. monocytogenes* in Ground Beef Patties–ELAINE D'SA, M. Harrison, S. Williams, and M. Broccoli, University of Georgia, Athens, GA
- Fate of *E. coli* O157:H7, *L. monocytogenes*, and *Salmonella* spp. in Reduced Sodium Beef Jerky–JUDY HARRISON, M. Harrison, and R. Rose, University of Georgia, Athens, GA
- The Impact of Cold Shocking on the Minimum Growth Temperature for *E. coli* O157:H7–JILL BOLLMAN, G. Blank, and M. Ismond, University of Manitoba, Winnipeg, Manitoba, Canada
- Influence of Package Atmosphere on Growth and Survival of Uninjured and Sublethally Heat-Injured *E. coli* O157:H7–JEFFREY SEMANCHEK and D. Golden, University of Tennessee, Knoxville, TN
- Fate of Selected Pathogens in Vacuum-Packaged Dry-Cured (Country-Style) Ham Slices at 2°C and 25°C–BRUCE LANGLOIS, W. Ng, and W. Moody, University of Kentucky, Lexington, KY
- Fate of *L. monocytogenes* on Smoked Fish Coated with Sorbate-Containing Cellulose-Based Edible Films–YAO-WEN HUANG and M. Harrison, University of Georgia, Athens, GA
- Effect of Acidulant Identity on the Acid Tolerance Response of Enterohemorrhagic *E. coli*–ROBERT BUCHANAN and S. Edelson, USDA-ARS-ERRC, Wyndmoor, PA
- Effect of pH and Acid Tolerance on Radiation Resistance of Enterohemorrhagic *E. coli*–ROBERT BUCHANAN, S. Edelson, and G. Boyd, USDA-ARS-ERRC, Wyndmoor, PA
- Acid Tolerance and Acid Shock Responses of *E. coli* O157:H7 and Non-O157:H7 Strains in the Presence of Arginine, Lysine and Methionine–DONNA GARREN and M. Harrison, University of Georgia, Athens, GA
- Characterization of Acid Shock and Acid Tolerance Response in *L. monocytogenes* Strains V7, V37, and CA–SADHANA RAVISHANKAR and M. Harrison, University of Georgia, Athens, GA

- Comparison of Chlorine and a Produce Rinse for Killing Pathogens on Fresh Produce–LARRY BEUCHAT, B. Nail, B. Adler, and M. Clavero, University of Georgia, Griffin, GA
- Inhibition of *Listeria innocua* in Manchego Cheese by Bacteriocin-Producing *Enterococcus faecalis*–MANUEL NUÑEZ, E. Garcia, M. de Paz, P. Gaya, and M. Medina, INIA, Madrid, Spain
- Inhibition of *L. monocytogenes* on Fresh Pork Loin Using a Nisin-Based Treatment–BRIAN SHELDON and N. Llorca, North Carolina State University, Raleigh, NC
- Control of *L. monocytogenes* by Use of Lysozyme, Lactoferricin-ß and EDTA–YIBEI ZHANG, S. Lewis, D. Kamau, and A. Dessai, Tuskegee University, Tuskegee, AL
- Antimicrobial Activities of Lysozyme and Lactoferricin-ß Against *Salmonella*–SARAH LEWIS, Y. Zhang, D. Kamau, and A. Dessai, Tuskegee University, Tuskegee, AL
- Incidence of *Salmonella* on Beef Carcasses at Various Stages of the Slaughtering Process–JOHN SOFOS, S. Kochevar, G. Smith, J. Reagan, D. Hancock, S. Ingham, G. Lundell, and J. Morgan, Colorado State University, Fort Collins, CO
- Probabilities of Passing *E. coli* Performance Criteria in Seven Beef Slaughtering Plants–JOHN SOFOS, S. Kochevar, G. Smith, J. Reagan, D. Buege, D. Hancock, G. Lundell, and J. Morgan, Colorado State University, Fort Collins, CO
- Incidence of *Edwardsiella*, *Salmonella* and *Shigella* on Fresh Catfish Fillets–CUSTY FERNANDES, T. McCaskey, G. Flick, and J. Silva, Virginia Tech, Blacksburg, VA
- Incidence of *Giardia lamblia* in Finished Potable Water Samples in Hermosillo, Sonora, México–MARTHA ELVIA DÍAZ CINCO, CIAD, A.C., Hermosillo, Sonora, México
- Occurrence of *Vibrio* spp. in Guacuco Clams (*Tivela mactroides*) and Chipi-chipi Clams (*Donas denticulatus* and *Donas striatus*) from Venezuela–L. GUEVARA and R. Diaz, Universidad Central de Venezuela, Caracas, Venezuela
- Revised Model for Aerobic Growth of *Shigella flexneri* to Extend the Validity of Predictions at Low Temperatures–LAURA ZAIKA, J. Phillips, J. Fanelli, and O. Scullen, USDA-ARS-ERRC, Wyndmoor, PA
- Lag Phase Durations of *L. monocytogenes* Cells in Different Physiological States to Changes in the Environment–RICHARD WHITING and L. Bagi, USDA-ARS-ERRC, Wyndmoor, PA
- Updated Models for the Effects of Temperature, pH, NaCl, and $NaNO_2$ on the Aerobic and Anaerobic Growth of *L. monocytogenes*–ROBERT BUCHANAN, J. Phillips, L. Bagi, A. Miller, and L. Zaika, USDA-ARS-ERRC, Wyndmoor, PA
- A Computer Model Describing the Competitive Growth of *L. monocytogenes* and *Lactococcus lactis* in Cucumber Juice–FREDERICK BREIDT and H. Fleming, USDA-ARS, Raleigh, NC
- Modulation of Lag Phase at 5°C of *L. monocytogenes* Scott A by Osmolytes–JEFFREY CALL and A. Miller, USDA-ARS, Wyndmoor, PA

Tuesday Afternoon—July 8, 1997

General Session—Food Safety Issues for Special Populations

- The Special Consumer Subgroup, What Is It?–MORRIS POTTER, Centers for Disease Control and Prevention, Atlanta, GA
- Special Pathogens: Foodborne Agents Posing Special Risk Concerns–THOMAS CEBULA, U.S. FDA CFSAN, Washington, D.C.
- The Impact of an Aging Population on the Special Consumer Risk Concern–ROBERT BUCHANAN, USDA-ARS-ERRC, Wyndmoor, PA
- The Value to Society of Protecting Population Subgroups at Special Risk–RICHARD BELZER, Office of Information and Regulatory Affairs, Washington, D.C.
- Food Safety and the Special Consumer-A Food Industry Perspective–DON ZINK, Nestle, USA, Inc., Glendale, CA
- Communicating Risk: Where Should Special Consumers Get Their Food Safety Information?–MARTHA RHODES ROBERTS, Florida State Dept. of Agriculture & Consumer Services, Tallahassee, FL

IAMFES Business Meeting

Wednesday Morning—July 9, 1997

HACCP Implementation in the Seafood Industry: Are You Prepared?

- Benefits and Pitfalls of HACCP for the Seafood Industry–DONN WARD, North Carolina State University, Raleigh, NC
- Experiences in Implementation of HACCP in Seafood Processing Plant–MICHAEL MONDRAGON, Tyson Seafood Group, Seattle, WA
- Experiences in Implementation of HACCP in Seafood Processing Industry–DOMY BROCE, King and Prince Seafood Corporation, Brunswick, GA
- Experiences in Implementation of HACCP in Seafood Foodservice Industry–ED REICHEL, DARDEN Restaurants, Inc., Orlando, FL
- FDA's Expectation for Seafood Industry Compliance–MARY SNYDER, FDA, Washington, D.C.
- Global Perspective on HACCP in Seafood Industry–ROY MARTIN, National Institute of Fisheries, Fairfax, VA

Future Trends and Considerations in Sanitation

- FSIS Pathogen Reduction/HACCP Rules and Implications for Sanitation–JANET COLLINS, American Meat Institute, Arlington, VA
- History of Contract Cleaning–Evaluation–Is It for You?–STEVEN SANDERS, Contract Services, Ltd., Burlington, IA
- Sanitizers, What Can be Done to Control New and Old Pathogens?–RICHARD BAKKA, Ecolab, Inc., St. Paul, MN
- Pest Control Without Pesticides–2000 and Beyond–ALFRED ST. CYR, American Institute of Baking, Manhattan, KS
- Foreign Material Control, X-Ray and Computer Expanded Tech Update–ARTHUR ISHAM, EG & G Astrophysics, Oak Ridge, TN
- Rapid Hygiene Monitoring, A New Light–ANNE DAVIES, Celsis-Lumac, Cambridge, United Kingdom

Science-Based Strategies for Protecting Our Global Food Supply

- The Birth of an Emerging Foodborne Pathogen and a Strategy for the Future–MICHAEL DOYLE, University of Georgia, Griffin, GA
- Highlights of the March 1997 "Conference on Emerging Foodborne Pathogens: Implications and Control"–KURT DEIBEL, General Mills, Minneapolis, MN
- Lessons Learned from the 1996 Outbreak of Enterohemorrhagic *Escherichia coli* Infection in Japan–YOSHIFUMI TAKEDA, International Medical Center of Japan, Tokyo, Japan
- Panel Discussion–Integrated Science-Based Approaches to Food Safety Protection–ERNESTO SALINAS, Nestle Mexico, Mexico City, Mexico; KAREN DODDS, Health Canada, Ottawa, Ontario, Canada; H. RUSSELL CROSS, Institute of Food Science and Engineering, Texas A & M University, College Station, TX; N. K. CHAWLA, National Dairy Development Board, Anand, India

Issues of Concern to the Juice Industry

- Fruit Juice Safety–An Overview–CAMERON HACKNEY, Virginia Tech, Food Science and Technology, Blacksburg, VA
- *Alicyclobacillus*–An Overview–ISABEL WALLS, National Food Processors Assn., Washington, D.C.
- Current and Alternative Technologies for Processing Fruit Juices–SUSAN SUMNER, Virginia Tech, Food Science and Technology, Blacksburg, VA
- Endogenous Mycoflora of Carton Paperboard–JAN NARCISCO, University of Florida, Winter Haven, FL
- A Quixotic Endeavor? Commercially Sterile-Aseptically Packaged Juice Products–RICHARD SMITH, Pepsico, Inc., Vaihalla, NY

Wednesday Afternoon—July 9, 1997

Viral Foodborne Disease: Emerging Agents, Emerging Methods

- Overview of the Viral Foodborne Disease Issue: New York State Perspective–JACK GUZEWICH, NYS Dept. of Health, Albany, NY
- Presumed Viral–DANIEL MAXSON, Clark County Health District, Las Vegas, NV
- Hepatitis A Virus: Molecular Methods of Detection–THERESA CROMEANS, U.S. Centers for Disease Control, Atlanta, GA
- Detection of Human Enteric Viruses in Foods–LEE-ANN JAYKUS, North Carolina State University, Raleigh, NC
- Inactivated Hepatitis A Virus Detection by Antigen Capture-PCR–DEAN CLIVER, University of California-Davis, Davis, CA
- Application of the 5' Nuclease Assay for the Detection of Bacterial and Viral Foodborne Pathogens–CHRISTINE PASZKO-KOLVA, PE Applied Biosystems, Foster City, CA

Epidemiological Typing of Foodborne Organisms

- Molecular Methods for Epidemiological Typing of Foodborne Pathogens–BALA SWAMINATHAN, Centers for Disease Control, Atlanta, GA
- PCR-RFLP for Epidemiological Typing–IRVIN NACHAMKIN, University of Pennsylvania, Philadelphia, PA
- RAPD and Fatty Acid Profiling for Typing of Foodborne Microorganisms–HEIDI SCHRAFT, University of Guelph, Guelph, Ontario, Canada
- Ribotyping–SCOTT FRITSCHEL, Qualicon, Wilmington, DE
- PFGE for Typing of Foodborne Pathogens–JOHN LUCHANSKY, Food Research Institute, Madison, WI

The Impact of the WTO and *Codex Alimentarius* on International and Domestic Food Standards

- *Codex Alimentarius* Initiatives to Meet International Trade Agreement Responsibilities: Overview–H. MICHAEL WEHR, National Milk Producers Federation, Arlington, VA
- Science/Risk Based Requirements of International Trade: Agreements and Responsibilities of Countries–GRETCHEN STANTON, World Trade Organization, Geneva, Switzerland

- *Codex Alimentarius* Initiatives to Meet International Trade Agreement Responsibilities: Microbiological Risk Assessment: Principles, Relationship to HACCP and Microbiological Criteria, Future Needs–DANE BERNARD, National Food Processors Association, Washington, D.C.
- *Codex Alimentarius* Initiatives to Meet International Trade Agreement Responsibilities: Chemical Risk Assessment: Procedures for Food Additives and Pesticides, Harmonization Activities, Initiatives for Food Additives–BARBARA PETERSEN, Novigen Sciences, Inc., Washington, D.C.
- Risk Assessment/Risk Management: Clarifying the Relationships–KAYE WACHSMUTH, USDA, Washington, D.C.
- U. S. Codex Strategic and Action Plans for Sound Science and Transparency–PATRICK CLERKIN, USDA, Washington, D.C.

Computer-Based Tools for Food Safety Management

- Computer-Based Tools for Management of Food Safety–MARTIN COLE, Nabisco, East Hanover, NJ
- Evaluation of Food Safety Net as a Risk Analysis Tool–DOUG POWELL, University of Guelph, Guelph, Ontario, Canada
- Fast Food on the Information Higway–National Food Safety Database on the World Wide Web–MARK TAMPLIN, University of Florida, Gainesville, FL
- Computer-Based Educational Tools–ROBERT GRAVANI, Cornell University, Ithaca, NY
- Computer-Based HACCP Tools–GEORGE EVANCHO, Campbell Soup Co., Camden, NJ
- Disease Surveillance Using Computer-Based Tools (Salm-Net)–IAN FISHER, Communicable Disease Surveillance Center, London, UK

IAMFES 84th Annual Meeting
TOURS AND SPECIAL EVENTS

Sunday, July 6, 1997 – 8:30 a.m. – 4:30 p.m.
Kennedy Space Center
Registration: $42 (Late $50) Lunch included

Enter the world of outer space with a guided tour of Kennedy Space Center. Hear the history behind the Mercury, Gemini, and Apollo rockets during a tour of the Rocket Garden! Walk through a full-size replica of the space shuttle. Then board the NASA bus and see the launching pads and the enormous Saturn V Rocket. Experience the spectacular IMAX film "The Dream is Alive," filmed by astronauts in outer space. Simply out of this world!

Sunday, July 6, 1997–8:30 a.m.–Shotgun Start
IAMFES Golf Tournament
Registration: $95 (Late $110)

Before dealing with issues of food protection, let's get together for some fun and a great round of golf. A best-ball tournament for all skill levels is scheduled at the Grand Cypress Golf Club designed by Jack Nicklaus. To request a golf registration form, call IAMFES at (800) 369-6337 or (515) 276-3344.

Opening Session
Ivan Parkin Lecture
Sunday, July 6, 1997 – 7:00 p.m.

Lecture: Martha Rhodes Roberts, Ph.D., Florida Department of Agriculture and Consumer Services.

Cheese and Wine Reception
Held in the Exhibit Hall
Sunday, July 6, 1997 – 8:00 p.m. – 10:00 p.m.

Join friends and colleagues for complimentary refreshments while viewing over 80 educational exhibits.

Exhibit Hall Hours

Monday, July 7, 1997 – 9:30 a.m. – 4:00 p.m.
Tuesday, July 8, 1997 – 9:30 a.m. – 4:00 p.m.

Monday, July 7, 1997 – 6:00 p.m. – 10:30 p.m.
Sail Away... A Key West Evening
Registration: $55 (Late $60)

Put on your best Florida shirt and join us poolside at the Hyatt Regency Grand Cypress as we transform you to the relaxing, casual atmosphere like the Florida Keys. Start your evening enjoying a tropical fruit drink with old and new friends. Then move on to a luscious and tantalizing dinner; don't forget the Key Lime pie for dessert!

Spend the rest of the evening enjoying the sounds of the Keys – Jimmy Buffet style. While enjoying the entertainment, you could try your hand at a friendly game of sand volleyball or horseshoe pitching. If that's not your style you can sit comfortably poolside and watch the waterfalls or stroll along the lake. It's sure to be a relaxing night to sail away.

Monday, July 7, 1997 – 9:00 a.m. – 4:00 p.m.
All Around Orlando
Registration: $30 (Late $35) Lunch on own

During this tour you will see Orlando in all its glory. The fun begins with a narrated tour through downtown Orlando. See the historic Church Street District and beautiful Lake Eola. You will drive through and see one of the most exclusive areas of Orlando, Winter Park. Our tour will also stop at the home of the Orlando Magic, the O-rena. Throughout the day there will be opportunities for some unique shopping experiences.

Tuesday, July 8, 1997 – 8:30 a.m. – 4:00 p.m.
Cypress Gardens
Registration: $49 (Late $55) Lunch on own

Travel across the rolling hills of central Florida, through orange groves to Cypress Gardens; a 223-acre family attraction that is home of the first, and still the finest, water-ski show. The botanical garden, created out of a swamp, was first opened to the public in 1936. Walk through exquisite gardens and see huge banyan trees, along with central Florida's flora and fauna. Meet graceful Southern Belles and shop the antebellum village, Southern Crossroads. There are a variety of shows, animal exhibits and rides for kids of all ages. Be sure to visit the all-new "Wings of Wonder" Butterfly Conservatory with more than 1,000 free-flying butterflies.

Wednesday, July 9, 1997
IAMFES Annual Awards Banquet
Reception: 6:00 p.m. – 7:00 p.m.
Banquet: 7:00 p.m.
Registration: $35 (Late $40)

Wednesday, July 9, 1997
IAMFES Children's Banquet
Time: 6:30 p.m. – 9:30 p.m.
Registration: $15 (Late $20)

Child Care

Child care can be arranged through the Hyatt Child Care or Camp Hyatt. Please contact the Hyatt Grand Cypress at (404) 293-1234 ext. 4440 for further details. Pre-registration is advised.

84th IAMFES Annual Meeting Registration Form

Hyatt Regency Grand Cypress — Orlando, FL — July 6 – July 9, 1997
(Use photocopies for extra registrations)

FOR OFFICE USE
Registration # _____
Date Rec'd. _____
First initial _____ Last name _____

First Name (will appear on badge) (please print) Last Name

Title Employer

Mailing Address (Please specify: Home or Work)

City State/Province Country Postal/Zip Code

Telephone # Fax #

Please check where applicable:

___ IAMFES Member
___ Non-Member
___ Local Arrangements
___ 30 Yr. Member
___ 50 Yr. Member
___ Past President
___ Executive Board
___ Speaker
___ Honorary Life Member
___ Exhibitor
___ IAMFES Sustaining Member
___ IAMFES Program Advisory Committee

Credit Card payments may be sent via Fax today!
(515) 276-8655

Sign up to become a NEW member
and take advantage of the member discount.

***REGISTER BY MAY 30, 1997 TO AVOID LATE REGISTRATION FEES**

REGISTRATION:	MEMBERS	NON-MEMBERS	AMOUNT
Registration (Banquet included)	$220 ($270 late)*	$305 ($355 late)*	_____
Student Member	$ 35 ($ 45 late)*	Not Available	_____
One Day Registration (Circle: Mon/Tues/Wed)	$110 ($135 late)*	$145 ($165 late)*	_____
Spouse/Companion (Name): _____	$ 35 ($ 35 late)*	$ 35 ($ 35 late)*	_____
Children (14 & Under, Names): _____	FREE	FREE	_____

NEW MEMBERSHIP FEES:		
Membership with *Dairy, Food & Environmental Sanitation*	$ 75.00	_____
Membership with *Dairy, Food & Env. Sanitation & Journal of Food Protection*	$ 120.00	_____
Student Membership ❒ *Dairy, Food & Env. San.* **or ❒ *Journal of Food Protection*	$ 37.50	_____
**Student Membership with *Dairy, Food & Env. San. & Journal of Food Protection*	$ 60.00	_____
***Full-time student verification required.*		
SHIPPING CHARGES: OUTSIDE THE U.S. - SURFACE RATE	$ 22.50 per journal	_____
AIRMAIL	$ 95.00 per journal	_____

OTHER FEES:	PER PERSON	# OF TICKETS	
Cheese and Wine Reception (Sun., 7/6)	FREE	_____	_____
IAMFES Golf Tournament (Sun., 7/6)	$ 95 ($ 110 late)	_____	_____
Sail Away... A Key West Evening (Mon., 7/7)	$ 55 ($ 60 late)	_____	_____
IAMFES Awards Banquet (Wed., 7/9)	$ 35 ($ 40 late)	_____	_____
Children's Banquet (Wed., 7/9)	$ 15 ($ 20 late)	_____	_____

SPOUSE/COMPANION EVENTS:	PER PERSON		
Kennedy Space Center (Sun., 7/6)	$ 42 ($ 50 late)	_____	_____
All Around Orlando (Mon., 7/7)	$ 30 ($ 35 late)	_____	_____
Cypress Gardens (Tues., 7/8)	$ 49 ($ 55 late)	_____	_____

❒ Please indicate here if you have a disability requiring special accommodations.

Credit Card Payments: Please Circle: VISA/MASTERCARD/AMERICAN EXPRESS

Card # _____ Exp. Date _____

Name on Card _____ Signature _____

Total Amount Enclosed $_____
U.S. FUNDS DRAWN ON U.S. BANK

Registration Information

Send payment with registration to IAMFES, 6200 Aurora Avenue, Suite 200W, Des Moines, IA 50322-2863. Make checks payable to IAMFES. Registration must be post-marked by May 31, 1997. Registration post-marked after May 31, 1997 will be charged the late registration fee. For additional information contact Julie Cattanach at (800) 369-6337.

Refund/Cancellation Policy

The IAMFES policy on refunds and/or cancellations is as follows: Registration fees, minus a $50 processing fee, will be refunded for written cancellations post-marked by June 20, 1997. No refunds will be made for cancellations post-marked after June 20, 1997, however, the registration may be transferred to a colleague with written notification to IAMFES.

Budget Rental Car Information

For information on special rental car rates from Budget call (800) 772-3773. Please mention Rate Code: BCD #: UO51950.

Guest Room Commitment
GOOD UNTIL JUNE 4, 1997
Make Your Reservation Now

HOTEL RESERVATIONS

IAMFES

84th Annual Meeting
July 6 – July 9, 1997
Hyatt Regency Grand Cypress
Orlando, FL

Please check accommodation requested:

❑ Single (1 person) ❑ Double (2 persons) ❑ Triple (3 persons) ❑ Quad (4 persons)

Bed type:

❑ King Bed ❑ 2 Double Beds

Special Requests _____

❑ Please indicate here if you have a disability requiring special accommodations.

NAME _____

SHARING WITH (Name) _____

COMPANY NAME _____

ADDRESS _____

_____ CITY _____

STATE/PROVINCE _____ COUNTRY _____ ZIP _____

TELEPHONE _____

ARRIVAL DATE _____ (Check-In Time is after 4 p.m.) DEPARTURE DATE _____ (Check-out Time is 12 p.m.)

SPECIAL REQUESTS _____

All Reservations must be held with one (1) night's deposit payable by credit card (or check received within fourteen (14) days). Reservations canceled less than seventy-two (72) hours prior to arrival will forfeit the deposit. After June 4, 1997, reservations will be accepted on a space and rate available basis.

CREDIT CARD # _____ TYPE OF CREDIT CARD _____

EXPIRATION DATE _____

CARDHOLDER'S SIGNATURE _____

SPECIAL ROOM RATES for this convention:
$120 per night, plus taxes

For Reservations Call: (800) 233-1234 or (407) 239-1234
Or FAX: (407) 239-3800

IAMFES
84TH
Annual Meeting
Orlando, Florida
July 6 – July 9

MAIL DIRECTLY TO:

HYATT REGENCY GRAND CYPRESS
C/O RESERVATIONS
1 GRAND CYPRESS BLVD.
ORLANDO, FL 32836-6734

ComingEvents

JUNE

·**2-3, Health Care Continuum Model (HCCM) Symposium,** at the Marriott on M St., Washington, D.C. Sponsored by the Soap and Detergent Association (SDA), the Cosmetic, Toiletry, and Fragrance Association (CTFA), and IAMFES. For further information, contact Dale A. Grinstead, Unilever Research U.S., 45 River Road, Edgewater, NJ 07020; Voice mail: (201) 840-2515; Fax: (201) 840-8276; E-mail: dale.a.grinstead@unilever.com.

·**3-4, Texas Affiliate Annual Meeting,** Omni Hotel (Formerly The Wyndham), Austin, TX. A variety of current and informational topics will be discussed. For more information, contact Ron Richter, P.O. Box 10092, College Station, TX 77842 or Phone: (409) 845-4409.

·**3-5, Crystallization in Foods,** New Brunswick, NJ. The principles of crystallization in foods will be discussed. The conditions and parameters necessary for controlling formation and growth of ice, sugar, and lipid crystals will be discussed through theoretical development and practical examples from the food industry. For additional information, contact Keith Wilson at (908) 932-9271 ext. 617 or Fax: (908) 932-1187.

·**4-5, Advanced HACCP Application: Training and Implementation,** Chong Yuet Ming Amenities Centre, University of Hong Kong. For more information, contact Miss Monisha Bhattacharya, Dept. of Botany, University of Hong Kong, Pokfulam Road, Hong Kong; Phone: +852 28578522; Fax: +852 28583477.

·**4-10, Food Microbiology and Safety: International Perspective,** at the University of Wisconsin – River Falls, River Falls, WI. The course consists of lectures, case studies and laboratory work to accomplish training in microbiological sampling, method validations, and quality assurance in food microbiology laboratory based on fundamentals of microbial ecology, risk assessment, and predictive microbiology. This course is designed for those who need to be familiar with current issues dealing with microbiological quality and safety of foods. For further information, contact The UWRF/Eijkman Foundation Food Microbiology course, Animal and Food Science Department, University of Wisconsin – River Falls, 410 S. 3rd St., River Falls, WI 54022; Phone: (715) 425-3150; Fax: (715) 425-3372.

·**7-11, Association of Food and Drug Officials (AFDO) 101st Annual Conference,** Sheraton Park Place, Minneapolis, MN. For more information, contact Ms. Denise Rooney, c/o AFDO, P.O. Box 3425, York, PA 17402 or Phone: (717) 757-2888.

·**12, Basics of Microbiology, Food Safety and Extended Shelf Life,** Toronto. This one-day program will provide you with an understanding of microbiological growth and the factors which affect this growth. Understand pathogenic microorganisms and their control. For more details, contact Marlene Inglis, Guelph Food Technology Centre, 88 McGilvray St., Guelph, Ontario, N1G 2W1, or Phone: (519) 767-5028; Fax: (519) 836-1281; E-mail: gftc@uoguelph.ca.

·**12-13, National Conference on Food Safety Education.** The conference title, "Changing Strategies–Changing Behavior: What Food Safety Communicators Need to Know" conveys the future direction of food safety education. Persons interested in attending the conference can obtain a registration brochure by faxing requests to USDA Graduate School at (202) 401-7304.

·**23-25, Food Extrusion,** St. Etienne, France. For more information, contact AACC Europe (Branch Office), Broekstraat 47, 3001 Heverlee, Belgium. Phone: +1 32 16.20. 40.35; Fax: +1 32 16. 20.25.35; E-mail: aacc.europe@pophost.eunet.be.

·**26-27, Southwest Milk Marketing Conference,** La Mansion Del Rio Hotel, San Antonio, TX. For further information, contact Dr. Bud Schwart, Dept. of Ag. Eco. TAMU, 458 Blocker Bldg., College Station, TX 77843-2124.

JULY

·**6-9, IAMFES Annual Meeting,** in Orlando, FL at the Hyatt Regency Grand Cypress Hotel. Advancing food protection worldwide with over 200 presentations and posters on the latest issues and research on food safety. For complete program information and registration forms, see page 302 of this issue of *DFES* or call (800) 369-6337; (515) 276-3344; Fax: (515) 276-8655; E-mail: iamfes@iamfes.org.

·**21-23, Current Good Manufacturing Practice (cGMP) for the Pharmaceutical and Allied Industries,** Cincinnati, OH. Topics covered will include not only the legal requirements for cGMP in the Federal Food, Drug, and Cosmetic Act but primarily the practical "how to" of purchasing, manufacturing, packaging, labeling and QA/QC, as well as training production personnel in cGMP. For more information, contact Registrar, The Center for Professional Advancement, P.O. Box 1052, East Brunswick, NJ

08816; Phone: (908) 613-4500; Fax: (908) 238-9113.

• **24-25, Food Safety Technology '97 Seminar,** U.S. Trade Center, Toyko, Japan. This event is being coordinated with the ongoing efforts of the U.S. Dept. of Agriculture, Foreign Agricultural Service to encourage the adoption of HACCP standards by Japanese food processing industries. For further information, contact **via international courier;* Ms. Yoko Hatano, Commercial Service, U.S. Embassy, 1-10-5 Akasaka Minato-ku, Tokyo 107 Japan, Phone: 81-3-3224-5318; Fax: 81-3-3589-4235; **via U.S. postal service;* Mr. Keith Kirkham, Commercial Attache, U.S. Embassy, Unit 45004, Box 204, APO AP 96337-5004; Phone: 81-3-3224-5085; Fax: 81-3-3589-4235.

AUGUST

• **11-15, Intro. to Food Science: Principles and Recent Advances,** Brunswick, NJ. The best food technologists need a broad understanding of food science that includes food microbiology, color and flavor chemistry, protein biochemistry, sensory evaluation and nutrition. This five-day program will give you a solid background in the science and applications of emerging technologies in the food industry. For additional information, contact Keith Wilson at (908) 932-9271 ext. 617 or Fax: (908) 932-1187.

SEPTEMBER

• **7-9, Quality Through Diversity Conference,** Renaissance Airport Hotel in Orlando, FL. The American Hotel and Motel Association and Conrad N. Hilton College at the University of Houston are joining together in announcing the 1997 Hospitality Industry Quality Through Diversity Conference. For more information, contact Laura Sutherland at (713) 743-2446.

• **8-10, Artisan Bread Decorating Techniques,** Manhattan, KS. This course will teach bread decorating techniques to create display loaves for use in bread displays. For additional information, or to enroll, contact American Institute of Baking, 1213 Bakers Way, Manhattan, KS 66502 or Phone: (913) 537-4750; Fax: (913) 537-1493.

• **8-10, Cell Culture and Hybridomas: Quality Control and Cyopreservation Techniques Workshop,** sponsored by the American Type Culture Collection (ATCC). For more information, contact ATCC, Workshop Coordinator, 12301 Parklawn Dr., Rockville, MD 20852; Phone: (800) 359-7370; Fax: (301) 816-4364; E-mail: workshops@atcc.org.

OCTOBER

• **5-9, Saudi Agriculture 97, 16th Agriculture, Water and Agri-Industry Show,** at the Riyadh Exhibition Centre. Further information can be obtained from Virginia Jensen, Kallman Associates, 20 Harrison Ave., Waldwick, NJ 07463.

• **8-10, Quality Management in the Food Industry,** Statler Hotel, Cornell University, Ithaca, NY. This 3-day introductory course is co-sponsored by the IFT Continuing Education Committee, IFT Food Quality Assurance Division, and Cornell University. For further information, contact Institute of Food Technologist's Professional Development Department at (312) 782-8424.

• **12-16, American Association of Cereal Chemists 82nd Annual Meeting,** at the San Diego Convention Center, San Diego, CA. The Annual Meeting includes a technical program, technical and poster sessions, table-top exhibits, new product/services sessions, educational short courses and social events. For additional information, contact AACC Headquarters, 3340 Pilot Knob Road, St. Paul, MN 55121-2097, or Phone: (612) 454-7250; Fax: (612) 454-0766.

• **13-16, Environmental Seminar Series for Asian Processors,** in Las Vegas, NV. For more information, contact Sacha Helfand at (703) 684-1080; E-mail: fpmsa@clark.net.

• **20-23, Packaging Basics for the Food Industry, School of Packaging,** Michigan State University, E. Lansing, MI. This 3-day introductory course is co-sponsored by the IFT Continuing Education Committee, IFT Food Quality Assurance Division, and Cornell University. For further information, contact Institute of Food Technologists Professional Development Department at (312) 782-8424.

• **22-24, Food Microbiology Symposium and Workshop,** The University of Wisconsin – River Falls, River Falls, WI. The symposium title is "Current Concepts in Foodborne Pathogens and Rapid and Automated Methods in Food Microbiology." A Rapids Methods in Food Microbiology workshop designed to provide practical demonstrations and discussion of various tests and instruments available for rapid detection, isolation and characterization of foodborne pathogens and toxins as well as prediction of shelf life and checking hygiene and sanitation in food processing facilities is also scheduled. For additional information, contact Dr. Purnendu C. Vasavada, Animal and Food Science Dept., University of Wisconsin – River Falls, River Falls, WI 54022 or Phone: (715) 425-3150; Fax: (715) 425-3785; E-mail: purnendu.c.vasavada@uwrf.edu.

• **27-30, Freezing and Freeze-Drying of Microorganisms Workshop,** sponsored by the American Type Culture Collection (ATCC). For more information, contact ATCC, Workshop Coordinator, 12301 Parklawn Dr., Rockville, MD 20852; Phone: (800) 359-7370; Fax: (301) 816-4364; E-mail: workshops@atcc.org.

Request for Preproposals

The ILSI Allergy and Immunology Institute is currently accepting preproposals (RFPPs) for the 1998 *New Investigator Awards* and *Food Allergy Awards for Food Scientists*.

New Investigator Awards for the basic and/or limited clinical research in food allergy and immunology are designed to provide support for promising investigators and encourage the application of new scientific developments to the understanding of underlying mechanisms and potential interventions in allergic diseases related to food. This award provides U.S. $50,000 per year for three years, to be used primarily for the investigator's salary. Applications are accepted from the prospective awardee with a letter of support for the program chief or department chair.

Food Allergy Awards for Food Scientists are to provide food scientists who demonstrate interest and potential to become investigators in allergy and immunology, focus on food allergy, with funding to support research in several areas. These include the underlying mechanisms of food allergy, the development of immunotoxicological testing procedures that show potential to predict the allergic potential of foodborne substances, the identification and characterization of food allergens, the detection of residues of food allergens or allergenic foods contaminating other foods, and the effect of processing on the allergenicity of foods including the development of novel hypoallergenic processing methods. Applications are accepted from the prospective faculty awardee with a letter of support from the department chair or dean. Awards of U.S. $25,000 per year for three years must be used for direct support of research.

The deadline for submission of preproposals is **June 16, 1997**. Successful applicants will be asked to submit full proposals in October 1997 for projects to begin in early 1998. Please contact the ILSI Allergy and Immunology Institute office to obtain copies of the appropriate requests for preproposals, Phone (202) 659-0074; Fax (202) 659-3859. Copies can also be obtained electronically from the ILSI website at http://www.ilsi.org.

MOVING?

Don't miss a single issue, please notify us as soon as possible.

Send your address changes to:

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IAMFES
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Des Moines, IA 50322-2863
or call (800) 369-6337;
(515) 276-3344;
Fax: (515) 276-8655;
E-mail: jcattanach@iamfes.org

Thank you for keeping your membership current.

Advertising Index

IAMFES GOLF TOURNAMENT AT THE GRAND CYPRESS GOLF CLUB

Sunday, July 6, 1997
8:30 a.m. – Shotgun Start

Come early and enjoy 18 holes of golf at the famous golf course designed by Jack Nicklaus.

Before we deal with problems involving food safety and protection, let's get together for some fun and a GREAT round of golf! IAMFES has organized a FUN, BEST-BALL Tournament with you in mind. EVERYONE IS WELCOME, regardless of skill.

About the Golf Course: We are scheduled to play the "New Course" at the Grand Cypress Golf Club designed by Jack Nicklaus. The New Course pays tribute to the great courses of Scotland with features replicated in such a way as to conjure visions of the Old Course at St. Andrews. Similarities include large undulating greens, bridges, walls and long, grassy mounds. Golfers on the New Course will have the feeling of playing in an open meadow.

To join your friends and colleagues in a round of golf, call the IAMFES office at (800) 369-6337; (515) 276-3344 or Fax us at (515) 276-8655 to request a registration form. Hurry! Registration deadline is June 6, 1997!

Companies: Are you looking for a unique way to promote your company at the IAMFES Annual Meeting? IAMFES is looking for sponsorship support for this event. If you would consider providing quality prizes (or cash prizes) for the IAMFES Golf Tournament, we would like to hear from you. Call David Tharp at the phone numbers listed above for more details.

IAMFES Offers the Dairy Practices Council *"Guidelines for the Dairy Industry"*

IAMFES has agreed with the Dairy Practice Council to distribute their *"Guidelines for the Dairy Industry."* DPC is a non-profit organization of education, industry and regulatory personnel concerned with milk quality and sanitation throughout the United States. In addition, its membership and subscriber rosters list individuals and organizations throughout the United States, Canada and other parts of the world.

For the past 26 years, DPC's primary mission has been the development and distribution of educational guidelines directed to proper and improved sanitation practices in the production, processing, and distribution of high quality fluid milk and manufactured dairy products.

The DPC Guidelines are written by professionals who comprise five permanent Task Forces. Prior to distribution, every Guideline is submitted for approval to the State Regulatory Agencies in each of the member states which are now active participants in the DPC process. Should any official have an exception to a section of a proposed guideline, that exception is noted in the final document.

The Guidelines are renown for their common sense and useful approach to proper and improved sanitation practices. We think that they will be a valuable addition to your professional reading library.

The entire set consists of 56 guidelines including:

1 Planning Dairy Freestall Barns
2 Effective Installation, Cleaning and Sanitizing of Milking Systems
3 Selected Personnel in Milk Sanitation
4 Installation, Cleaning, & Sanitizing of Large Parlor Milking Systems
5 Directory of Dairy Farm Building & Milking System Resource People
7 Sampling Fluid Milk
8 Good Manufacturing Practices for Dairy Processing Plants
9 Fundamentals of Cleaning and Sanitizing Farm Milk Handling Equipment
10 Fluid Milk Shelf-Life
11 Sediment Testing and Producing Clean Milk
13 Environmental Air Control & Quality for Dairy Food Plants
14 Clean Room Technology
16 Handling Dairy Products from Processing to Consumption
17 Causes of Added Water in Milk
18 Fieldperson's Guide to Troubleshooting High Somatic Cell Counts
21 Raw Milk Quality Tests
22 Control of Antibacterial Drugs and Growth Inhibitors in Milk and Milk Products
23 Preventing Rancid Flavors in Milk
24 Troubleshooting High Bacteria Counts of Raw Milk
25 Cleaning and Sanitizing Bulk Pickup and Transport Tankers
28 Troubleshooting Residual Films on Dairy Farm Milk Handling Equipment
29 Cleaning and Sanitizing in Fluid Milk Processing Plants
30 Potable Water on Dairy Farms
31 Composition and Nutritive Value of Dairy Products
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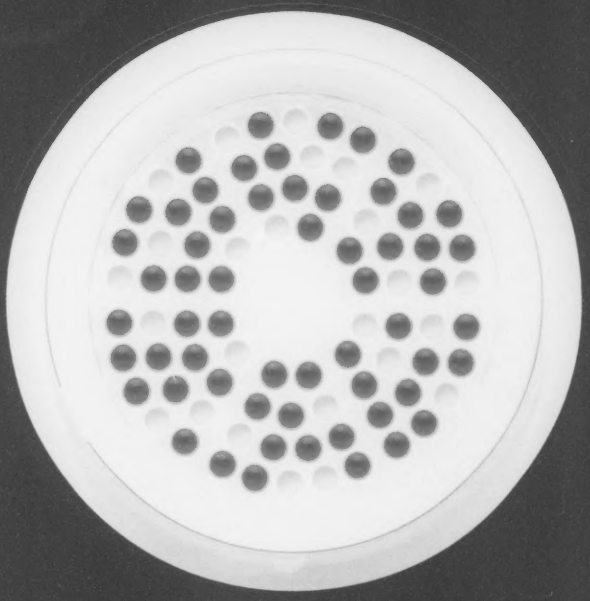

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