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Thoughts From the President . . .

By
Ron Case
IAMFES President

School is out and vacation time is here. This is the time we get away from it all by loading the kids in the car and going somewhere. I would like to suggest you wait until the first part of August and head for Arlington Heights, Illinois. Bring the family to this years IAMFES annual meeting August 5-8. Take a working vacation (you work and they vacation). If you are worried about what they will have to while you are at the meetings just look at the Special Events Program. There are tours of the world famous Chicago Art Institute, Morton Arboretum, Haeger Pottery to see art pottery made, historic Long Grove Village, and Chicago's "Magnificent Mile." If you come in to town before the meeting you can enjoy Major League Baseball, live theater, horse racing, two major zoos, Great America amusement park, the world's tallest building, shopping at Woodfield one of the world's largest shopping centers, Lake Michigan, major museums like the Museum of Science and Industry and the Field Museum of Natural History, and almost anything else. If you don't have a chance to see everything you want to before the meeting you can take a train (yes a real train) from near the hotel to downtown during the week. Chicago is one of the world's greatest cities and this is a great time of the year to see it.

Many members have been bringing their families to the IAMFES meeting for years. Strong friendships have developed among members' families from these meetings. My children look forward to seeing the children of other members each year. The annual meeting has become somewhat of an extended family reunion which I really enjoy seeing everyone and finding out what has happened since last year.

Bring your family this year, take a few vacation days and enjoy the meeting and Chicago. I think you will enjoy it.

Well, it is summer and today is a nice day so I'm going to stop this column and go fishing. See you in August!

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Transmission of a *Listeria* sp. through a Cold-Air Wind Tunnel

H.D. Goff and P.J. Slade,
Department of Food Science, University of Guelph,
Guelph, Ontario, N1G 2W1, Canada

Abstract

The objective of this project was to explore the potential for post pasteurization contamination of frozen, unpackaged ice cream products, e.g. novelty or extrusion items, by exposure to contaminated air. A pilot scale wind tunnel, 2.4 m in length, was operated at -16° to -18°C with forced air. Ice cream was exposed at the exit end of the tunnel and a *Listeria* sp. was introduced to the inlet air via an aerosol spray, exposure to a spread plate, or exposure to a quiescent broth. In all cases, the *Listeria* sp. was detected on the surface of the ice cream after 15 minutes of exposure to the air movement, by either the USDA technique or by a two-stage method which included a non-selective primary enrichment. These results show that post-pasteurization contamination via aerosol formation of the organism can occur in the processing plant, even at subzero temperatures.

Introduction

The importance of *Listeria monocytogenes* in the dairy industry has recently been reviewed (12). Outbreaks of listeriosis have been attributed to consumption of contaminated dairy products (7,13), and subsequent investigations have concentrated on the incidence of *Listeria* spp. in raw milk (1,15,19,20), and cheeses (5,17). Relatively few studies have examined the occurrence and survival of listeria in other dairy products, particularly ice cream. In a recent investigation of an outbreak of listeriosis, diet histories revealed patients were more likely to have eaten ice cream (or salami) than were controls (18). In the U.S. Food and Drug Administration (FDA) Dairy Products Safety Initiatives Program, fiscal year 1987, a low but significant number of ice cream products were found contaminated with *L. monocytogenes* (8). Ice cream novelties and novelty freezing equipment have also been suggested as being problematic by the ice cream industry.

The generally accepted concensus is that proper pasteurization of milk under commercial conditions is effective at eliminating *L. monocytogenes* in the raw material (3). Hence the occurrence of *Listeria* spp. in ice cream may result from post-pasteurization contamination of the mix or final product. This investigation aimed to study the potential for airborne transmission of a *Listeria* sp. to an otherwise listeria-free unpackaged ice cream product in a cold-air wind tunnel, similar to the rapid freezing of unpackaged and exposed novelty or extrusion products. A strain of *L. innocua* containing an antibiotic resistance marker was introduced to the air stream. This was considered to simulate behavior of *L. monocytogenes* in all but pathogenicity (thus protecting the processing environment), since similarities in natural habitat and cultural characteristics of the two species have been recognized (6). Two methods for recovering listeria from contaminated products were used. One was the United States Department of Agriculture (USDA) technique, which has been found to give more isolations from ice cream than the FDA method of Lovett *et al.*(15) (Lee W.H., personal communication). The other was the two-stage method used in a survey of raw milk for *Listeria* spp. (19), which includes a non-selective primary enrichment to permit possible resuscitation of potentially freeze-injured listeriae. No attempt was made to simulate any particular conditions of air movement within a specific piece of equipment, e.g. air velocity or turbulence. Rather, the objective was to determine whether airborne transmission from a liquid or solid source of inoculum could occur into a -18°C moving air stream and be deposited on exposed product 2.4m from the source of inoculum.

Materials and Methods

Bacterial Cultures

The strain of *L. innocua* used was isolated in a survey of raw milk and found resistant to 30µg tetracycline by disk assay (19). The inoculum strain of *L. innocua* was stored refrigerated on tryptose agar (TA) slants (all media are Difco Labs, Detroit, MI 48232 unless otherwise stated). A loopful of growth was inoculated into tryptic soy broth + 0.6% yeast extract (TSB-YE) and incubated overnight at 37°C. Dilutions were made in 0.1% peptone water blanks to give a concentrated broth (10^6-10^8 cfu/mL) and a diluted broth (10^2-10^3 cfu/mL). Plate count agar (PCA) inoculated with 1.0mL of appropriate dilutions in duplicate and incubated for 24h at 37°C was used to determine approximate cfu's/mL of broth.

Design and Operation of Cold-Air Wind Tunnel

A stainless steel insulated chamber, 0.3m in width and height and 2.4m long as shown in Figure 1, was used to examine the transmission of *L. innocua* through cold moving

air to simulate a wind tunnel. The temperature inside the tunnel was maintained at -16 to -18°C with dip feed liquid carbon dioxide sprayed into the chamber inlet. Air movement was maintained with a propeller-type fan at the inlet. The exit air was diverted by means of plastic tubing into a trap of 25 ppm iodine solution to control spread of the organism into the processing environment.

Preparation and Seeding of Ice Cream

Ice Cream was prepared to a formula of 12% fat, 11% milk solids-not-fat, 10% sucrose, 5% corn syrup solids, and 0.2% stabilizer/emulsifier, pasteurized at 74°C/15 minutes, homogenized, rapidly cooled to 4°C for overnight aging, frozen continuously through a Cherry-Burrell Vogt freezer, packaged in 500 mL paper containers, hardened at -25°C, and stored at -18°C until needed. As required, single packages of ice cream were removed from cold storage, the container was peeled off the surface, and the product was placed at the end of the wind tunnel for 15 minutes of exposure to the contaminated air (Figure 1). A preliminary experiment in which 12 petri plates had been placed at equidistant intervals along the length of the tunnel had shown that transmission of listeriae to the end of the tunnel was possible. Thus, product placement furthest from the inlet air and source of inoculum was chosen to represent the most taxing scenario. Blank runs with no inoculation were performed prior to each trial. Listeria was introduced to the inlet air in four different ways, as follows:

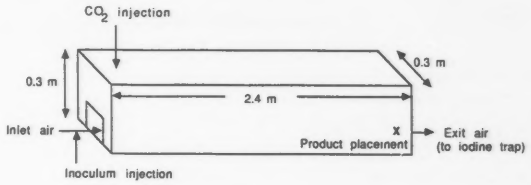
a) 5.82mL of the concentrated broth (10^6-10^8 cfu/mL) were sprayed into the inlet air every 2 minutes,
b) 5.82mL of the diluted broth (10^2-10^3 cfu/mL) were sprayed into the inlet air every 2 minutes,
c) 1.0mL of concentrated broth (10^6-10^8 cfu/mL) was spread on the surface of a TSA-YE plate, and incubated overnight at 37°C. This plate was then placed in the inlet air.
d) 1.0mL concentrated broth (10^6-10^8 cfu/mL) was diluted in 10mL distilled water in a Petri dish, and placed in the inlet air.

Each method of inoculation was replicated three times on different days. An exhaustive cleaning routine that involved dismantling the tunnel, scrubbing with an alkaline cleaner, rinsing with hot water, sanitizing with 100ppm chlorine, and cleaning the surrounding environment, was performed after each run.

Microbiological Analysis of Ice Cream

Blocks of ice cream from both the seeded runs and the blank runs were split in two, parallel to the direction of airflow. Duplicate 25g samples, with as much surface area as possible, were removed from one half and examined using the USDA method of McClain and Lee (16), and from the other half by the two-stage technique used by Slade *et al.* (19). Basically, in the USDA method, 25g samples were enriched for 24h at 30°C in 225mL primary *Listeria* enrichment broth (PLEB), containing 12mg/L acriflavine, then 0.1mL of growth in PLEB was transferred to 10mL of

Figure 1. Design of the cold-air wind tunnel which was used to examine the transmission of *Listeria* sp. through aerosol formation and subsequent contamination of the ice cream inside the tunnel.



secondary *Listeria* enrichment broth (SLEB), containing 25mg/L acriflavine which was incubated a further 24h at 30°C. From SLEB a loopful of culture was streaked onto McBride *Listeria* agar (MLA), [not *Listeria* plating medium (LPM) described by McClain and Lee (16)].

In the two-stage technique, 25g samples were pre-enriched in 225mL TSB-YE for 5 days at 4°C, then 1.0mL was inoculated into 9mL thiocyanate-nalidixic acid broth (TNAB) + 25mg/L acriflavine and incubated 48h at 37°C. A loopful from TNAB was streaked to MLA.

All MLA plates were incubated 48h at 37°C, then examined by oblique transillumination. Two suspect colonies from each MLA plate were restreaked to tryptic soy agar + 0.6% yeast extract (TSA-YE) plates which were incubated 24h at 37°C. Representative colonies were identified as *L innocua* using tests for motility, gram-stain, catalase, (non-) haemolysis and fermentation pattern of mannitol, rhamnose and xylose, and resistance to 30µg tetracyline by the disk assay confirmed the inoculated strain (19).

Results and Discussion

All blank runs were found to be negative for *Listeria* spp. This indicated that the original ice cream blocks were free of *Listeria* spp. and the cleaning regime was successful.

Table 1 shows that the *Listeria* sp. was isolated from ice cream after exposure to each type of inoculum. From the atomized concentrated broth and even the atomized dilute broth, which were both sprayed directly into the tunnel, this is not surprising. However, the fact that enough listeriae can escape and contaminate the finished product from the surface of a solid matrix (the spead plate) and from a quiescent dilute broth as a result of the air velocity and turbulence created by this design is cause for concern. Product exposure to cold air streams as simulated here are frequently encountered in ice cream novelty manufacture. Thus it has been effectively shown that listeriae may be transferred in aerosol from reservoirs in the processing environment to the product. This supports the notion that post-pasteurization contamination may be a factor contributing to the presence of *Listeria* spp. in ice cream and frozen novelties.

Table 1. Recovery of *Listeria* inocua from ice cream subjected to three replicates of varying sources of inoculation of -18°C air within a wind tunnel.

SOURCE	RECOVERY METHOD	
	USDA method	Two-stage technique
a) Atomized concentrated broth	-	+
	+ +	+ +
	+ +	+ +
b) Atomized dilute broth	+	+
	+	+
	-	+
c) Spread plate	+	+
	+	+
	-	+
d) Quiescent dilute broth	+	+
	-	+
	+	-

+ + high levels of recovery

+ low levels of recovery

- no recovery

There were four instances when listeriae were isolated by the two-stage technique only but not the USDA method, and one instance when the ice cream was positive only by the latter method but not the other. It is possible that non-selective pre-enrichment in the two-stage technique may allow resuscitation of freeze-injured *Listeria* whereas the USDA method may not. However, definite conclusions cannot be drawn from the present observations. Golden *et al.* (10) found that when frozen in non-selective broth media, viable populations of four *L. monocytogenes* test strains were only reduced by 3-6% after 14 days at -18°C, but up to 82% of these viable populations were injured. When added to a chocolate ice cream mix uninjured cells of several strains of *L. monocytogenes* were almost completely recovered by direct plating on several selective agar media, although some diversity was observed among media with respect to their suitability to recover freeze-injured cells (11). Certainly there is scope for further investigations of survival and methods to recover *Listeria* spp. from frozen products, particularly ice cream, at various stages of processing and during cold storage under commercial conditions.

Measures to restrict the spread of *Listeria* spp. in the dairy processing environment, especially with consideration to the Hazard Analysis Critical Control Point (HACCP) concept, have been addressed (9). Specific steps to control *Listeria* in the plant have been advocated, particularly those pertinent to the prevention of formation of potential aerosol reservoirs and airborne transmission of *Listeria* spp. to the product. Advice on the use of bacterial filters on air-handling units, and effective cleaning and sanitation of walls, ceilings and drains has been advanced (2,8). Further recommendations to keep surfaces dry and sanitized, and to change filters on air-handlers and dryers often, with care taken to ensure air entering the handler does not come from milk intake or other potentially contaminated areas, have been proposed (4). Sanitizers in common commercial usage have previously been tested and found to have bactericidal properties at recommended concentrations against *L. monocytogenes* (14). Appropriate cleaning and sanitation was effective at eliminating contamination by the strain used in this study as evidenced by the failure to detect the *Listeria* sp. on ice cream in any of the control runs after clean-up.

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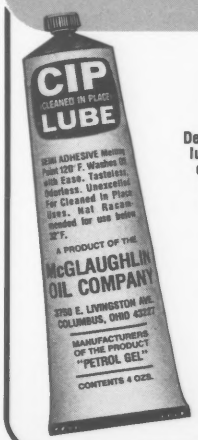

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Where are *Listeria* likely to be found in dairy plants?

John H. Nelson, Food Research Institute
University of Wisconsin, Madison

Abstract

Listeria testing was done on over 8800 environmental samples from 62 dairy plants during 1987-88. Plant sampling was not statistically based, but was biased toward *Listeria* detection. The overall incidence of *Listeria* was 10% with fluid milk (12%) and frozen product plants (8%) exhibiting a higher incidence than butter (5%), processed cheese (4%), natural cheese (3%), and dry product (1%) plants. *Listeria* was detected most frequently in floor drains (38%) and conveyors (36%).

Introduction

Major regulatory actions, including product recalls have been triggered by detection of *Listeria monocytogenes* in dairy products. Industry response to this problem has included environmental surveys of processing plants for *Listeria*. These were intensive during 1987-88. This report describes an analysis of *Listeria* testing results of dairy plant environments during that period.

Procedure

Results of *Listeria* test on environmental samples from 62 dairy plants were provided by dairy processors. No results on product were provided. Sampling and testing programs differed among companies but the objectives were essentially the same--to detect *Listeria* wherever it may be in the plant environment. Locations yielding positive results were frequently resampled. Some testing laboratories identified species, others did not. Thus, both confirmed and presumptive positive results are included in the tabulation.

Results

The data was tabulated to assess the relationship of plant type and sampling location to incidence of *Listeria*-positive test results. The incidence of *Listeria* in six different types of dairy processing plant environments is displayed in Table 1. The six types are fluid milk, butter, natural cheese, dried product, processed cheese, and frozen product. The number of plants of each type are listed as well as plant years. Most of the plants provided data covering two years, 1987-88, or two plant years per plant.

Table 1. Incidence of Listeria in environmental samples taken in dairy processing plants

Description	Totals	Type of dairy plant[a] A	B	C	D	E	F
Number of plants	62	19	5	18	8	8	4
Plant years[b]	102	32	6	30	14	14	6
Listeria tests							
Number done	8881	6207	133	901	357	417	866
% positive	10%	12%	5%	3%	1%	4%	8%
Number positive	884	765	7	25	5	14	68
L. monocytogenes:							
Confirmed	439	387	0	16	4	3	29
Presumptive	318	286	1	4	0	0	27
L. innocua confirmed	104	74	4	3	0	11	12
L. seeligeri confirmed	13	12	0	1	0	0	0
L. welshimeri confirmed	7	4	2	0	1	0	0
L. gravii confirmed	3	2	0	1	0	0	0

[a] A - Fluid milk. B - butter. C - natural cheese. D - dried product. E - processed cheese. F - frozen product.

[b] Number of plants times number of years sampled - most plants were sampled for 2 years, the remainder for 1 year.

Positive tests in which *Listeria* species were confirmed totaled 566 of which 439 or 78% were monocytogenes.

The incidence of *Listeria* at 12 locations in six types of dairy plant environments is displayed in Table 2. Table 3 contains a dual tabulation, comprising numbers and percentages, of the location of *Listeria* in all plants and fluid milk plants. There were too few *Listeria* results for the other 5 plant types to support meaningful percent distributions.

Table 2. Location of Listeria in dairy plant environments.

Area/Location	Listeria-positive samples in plant type[a] All	A	B	C	D	E	F
Milk intake: drains	14	4	0	8	2	0	0
Processing:							
Packaging equipment	35	12	0	0	0	0	23
Other equipment	4	3	0	0	0	1	0
Conveyors, palletizers	210	171	0	1	0	0	38
Drains	156	140	4	3	0	9	0
Floors, pooled liquid	69	64	0	1	0	2	2
Coolers:							
Conveyors	41	39	0	2	0	0	0
Drains	87	85	0	2	0	0	0
Walls, floors, pooled liquid	55	50	0	3	0	0	2
Storage: drains	9	7	0	1	0	1	0
Shipping:							
Drains, trailers, environment	10	6	1	2	1	0	0
Dirty pallets	8	8	0	0	0	0	0
Miscellaneous	17	10	2	2	2	1	0
Location not specified	169	166	0	0	0	0	3
Totals	884	765	7	25	5	14	68

[a]Refer to footnote a, Table 1 for description of plant type.

Table 3. Location of *Listeria* in all plants and fluid milk plants, tabulated by number and % distribution.

Area/Location	All plants		Type A plants	
	#	%	#	%
Milk intake: drains*	14	2	4	1
Processing:				
Packaging equipment	35	5	12	2
Other equipment	4	1	3	1
Conveyors, palletizers@	210	30	171	29
Drains*	156	22	140	24
Floors, pooled liquid	69	10	64	11
Coolers:				
Conveyors@	41	6	39	7
Drains*	87	12	85	14
Walls, floors, pooled liquid	55	8	50	8
Storage: drains*	9	1	7	1
Shipping:				
Drains,* trailers, environment	10	1	6	1
Dirty pallets	8	1	8	1
Totals	698	99	589	100
*All drains	267	38	242	41
@All conveyors	251	36	210	36

Discussion

Sampling criteria and procedures were not standardized, hence statistical assessment is not feasible. The overall incidence of *Listeria* positive samples, 10%, seems high. However, the objective of environmental *Listeria* sampling is to detect *Listeria*, and sampling protocols are biased toward *Listeria* detection. Detection depends upon zealous, sometimes repetitive sampling. It is routine to more intensively sample high risk areas which appear to be suspect or have prior history of positive results.

Fluid milk and frozen products plants had a higher incidence of *Listeria* positives than the other four types of processing plants. This observation may correlate with the incidence of condensate consequent to manufacturing and 7packaging cold products. Dry environments prevail in dried product and process cheese plants.

The incidence of *Listeria* in various locations in plant environments correlates well with wet conditions. *Listeria* was detected frequently in wet locations, including conveyors, floors and drains. Condensate was cited as present on some equipment which tested *Listeria* positive.

Floor drains (38%) and conveyor equipment (36%) were the predominant sites testing positive for *Listeria*. Both locations are commonly wet and difficult to maintain in clean condition.

Not all *Listeria* positive locations fit within the 12 location categories. Seventeen positive sites included ceiling in the processing area, CIP rinse tank, case washer water, glycol solution, butter remelt area, return dumping area, hog feed tank drain, roof evaporator drip pan, driveway pit, main entrance, office and shop. Several of these locations are wet and difficult to maintain in clean condition.

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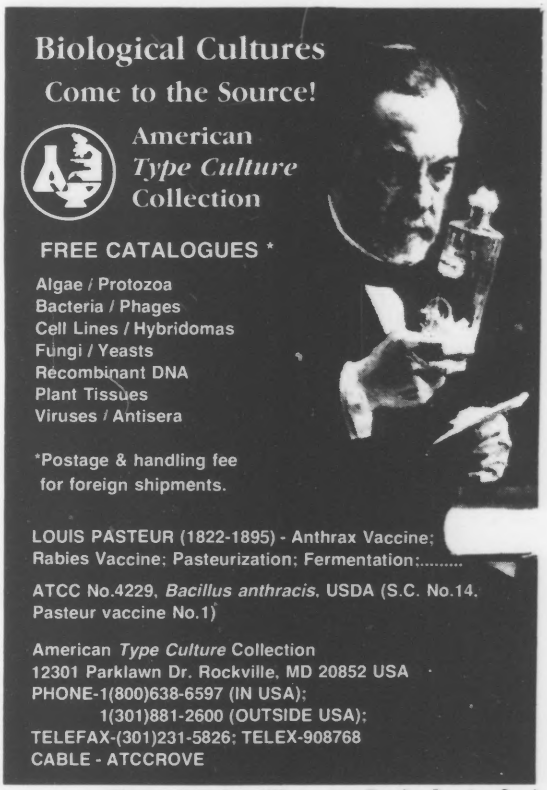

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An Evaluation of Freezing Point Changes in Raw Milk Analyzed by Dairy Quality Control Institute, Inc. over Ten Years, 1979-88

Vernal Packard[1] and Roy Ginn[2]

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Abstract

The National Conference on Interstate Milk Shipments has appointed a Task Force to consider a universal freezing point base for milk. In consideration of this activity, Dairy Quality Control Institute, Inc. undertook an evaluation of freezing point data accumulated by the laboratory over the 10-year period, 1979-88. The data reflected over 275,000 analyses of herd milk supplies originating in Minnesota and western Wisconsin. Freezing point was found to average -0.5432 degree Hortvet (°H) for the years 1979-83 and -0.5460 °H for the years 1984-88. At the same time, somatic cell counts of these milk supplies dropped from an average of 406,000/ml to 377,500/ml during the first and second 5-year periods, respectively. Although the data represent true commercial milk supplies (i.e., not necessarily free of added water), the average freezing point of present-day milk supplies was found to be lower than those analyzed by Henningson (2) in his study of water-free milk samples from across the United States and Canada. This fact may be due in part both to improved (lower) somatic cell counts (which are inversely related to lactose content) and genetically induced increases in lactose level. In the present survey, freezing point increased about 0.003 °H during summer months, a fact which, in and of itself, brings into questions the use of a single freezing point standard year-round. Over the ten years covered by the data, percentage of milk supplies containing less than 0.2% added water, (using -0.0540°H as base) increased from about 75% to over 90%. A breakdown of the data by quarter-year indicated significantly lower percentage of milk supplies meeting a standard of less than 0.2% added water during summer than late fall and winter months (a fact likely due at least in part to the artefact caused by use of a single freezing point base throughout the entire year).

[1]Department of Food Science and Nutrition, University of Minnesota, St. Paul, MN 55108.
[2]Dairy Quality Control Institute, Inc., 5205 Quincy Street, St. Paul, MN 55112.

Introduction

Freezing point of milk carries a highly important significance when it is used as a basis for determining presence of added water. To the extent that milk supplies can be kept free (or nearly so) of added water, cost of transportation and processing of milk and dairy products is lowered. At the same time, a large number of dairy cooperatives now use freezing point (or some base level of added water) as one of several prerequisite quality criteria for determining whether or not a given producer's milk supply will be eligible for premium payments awarded as a result of meeting certain compositional standards. Hence, price of milk is directly tied to freezing point data. In addition, regulatory action taken against milk producers for water adulteration of milk is also based on an analysis/-analyses of freezing point of milk.

For the above reasons, the National Conference of Interstate Milk Shipments has appointed a Task Force to study the feasibility of establishing a universal freezing point and/or method of utilizing freezing point data in detection and regulation of adulteration of milk with water.

In the application of freezing point to routine plant and regulatory control of added water, data of Henningson (2) are commonly used. The Henningson study of milk supplies originating in the United States and Canada dates back to 1968. In this survey, 660 milk samples, samples collected to ensure freedom from added water, were analyzed. Results, reported in degrees Centigrade, are now know to be in error (1) and should be expressed as degrees Hortvet (°H). The average freezing point was found to be -0.5404 °H, with a standard deviation of -0.00676. Using the preceding values and using 2.326 standard deviations to reflect 95% confidence in 99% of observations, Henningson calculated what amounts to an upper freezing point base, i.e. a freezing point that would not be expected to be exceeded at the stated confidence level. This base (-0.525 °H), therefore, takes into account natural variations in freezing point and, in statistical terms, reduces to near negligible probability the likelihood of a higher value being found in natural, unadulterated milk supplies. Over time, -0.525 °H has become the freezing point level commonly used by

regulatory agencies in prosecuting cases of adulteration of milk with water. This is the value cited by the Association of Official Analytical Chemists (AOAC) (1) as presumptive evidence that a sample of milk is "water-free." Confirmation of this fact, however, can only be made by obtaining (and testing), under specified conditions, a sample known to be free of added water.

Although the value -0.525 °H may serve regulatory purposes, it is not particularly useful as a basis for deciding the need for dairy plant field work in investigating and correcting, where appropriate, problems of suspected adulteration of milk on dairy farms. That is, the difference between the average freezing point found by Henningson (-0.5404 °H), and the calculated upper base (-0.525 °H) allows for as much as 3% added water in those milk supplies known to reflect the true average freezing point. For this reason, the authors undertook a study to establish a "working factor" for field application (3). In this study, over 10,000 freezing point analyses were obtained from ongoing laboratory control programs in dairy organizations operating in Minnesota. No attempt was made to ensure freedom from added water. Nevertheless, the average freezing point of these milk supplies was found to be -0.5440 °H, a value slightly lower than that observed by Henningson. A reasonable "working factor" was calculated from these data, taking into account (1) the possible presence of some added water in some of the milk supplies surveyed, (2) variations in analytical variability, and (3) a single standard deviation from the mean (average). The latter was used in order to ensure fruitful farm visits (likely adulteration) at least two-thirds of the time. The value thus derived was -0.540 °H. As will be noted, this value is within 0.0004 °H of the mean value established by the Henningson study, but assumes an actual average freezing point of Minnesota milk supplies of -0.544 °H.

Data from the above study also indicated some regional variations in freezing point of Minnesota milk supplies, with average values ranging from -0.539 °H to -0.544 °H. Similar findings were also reported by Henningson, although the area covered by his investigation was much larger, i.e. ranging across the entire North American continent. It is also of interest and possibly meaningful in interpretation of data obtained by the authors of this paper that, in the Henningson study, no milk samples were obtained from Minnesota.

In any event, as an initial attempt to address some of the issues involved in determining the feasibility of establishing a "universal" standard freezing point for milk supplies in the United States, the authors decided to evaluate freezing point data accumulated by Dairy Quality Control Institute, Inc. over the years 1979-88. Of interest were (1) any changes in average freezing point that might have occurred over the period in question, (2) any related changes in somatic cell counts (and possible lactose content) during the same time period, (3) extent of seasonal variations in freezing point of milk and (4) trend in added water of milk supplies analyzed by the laboratory.

Materials and Methods

Routine analyses of freezing point were made on an Advance Instrument, Model 4CII, automatic cryoscope (Advance Instruments, Inc., Needham, MA). Somatic cell counts were determined using a Coulter Counter, Model MCC instrument (Coulter Electronics, Hialeah, Florida). Data were obtained from records kept by Dairy Quality Control Institute, Inc. and represent a fairly large region of Minnesota as well as a smaller, though significant, portion of western Wisconsin.

The data reflect ongoing operations of the laboratory during the 10-year period 1979-88. That is, fresh raw milk samples were collected on a random stratified basis for quality analyses in general. No attempt was made to procure samples known to be free of added water. Because a large number of samples were analyzed, however, the data certainly approach very closely the true freezing point of milk in the region in which they were obtained. The data were evaluated on a quarterly basis over two 5-year periods and on an annual basis over the ten years, 1979-88. The trend in status of added water in the milk supplies was determined by assessing percentage of samples showing less than 0.2% added water, i.e. a freezing point no lower than -0.539 °H.

Results and Discussion

Data in Table 1 show the average freezing point and somatic cell count on a quarterly overall basis for the two 5-year periods, 1979-83 and 1984-88. Seasonal variations are apparent, with highest values occurring during summer months and lowest during late fall and winter months. The range in seasonal difference was 0.0026°H for the first five years and 0.003°H for the second five years of observations. These are not insignificant differences. If, in fact, the 5-year average is taken as the basis for determining percent of added water, then seasonal variation alone accounts for 0.33% added water in the period covered by the first five years of observations and 0.29% for the second five years. These calculations may be verified using the conventional formula for determining percentage of added water:

$$\% \text{ added water} = \frac{\text{avg. F.P. - observed F.P.}}{\text{avg. F.P.}} \times 100$$

If, in addition, true regional differences in average freezing point of milk exists, then this fact may compound the problem associated with seasonal variations. For example, milk from one of the regions included in the Henningson study (2) showed an average freezing point of -0.5356°H. Taking -0.5404 °H as the national average value, (a figure also derived in the Henningson study) this difference, translated by calculation into percentage of added water, amounts to 0.89%. In a previous investigation by the authors (3), regional differences were of such magnitude as to account for as much as 0.92% added water. To the

Table 1. Average freezing point and somatic cell count of raw milk by quarter-year for two five-year spans, 1979-83, 1984-88.

Factor	Jan. - Mar.	Apr. - June	July - Sept.	Oct. - Dec.	Annual Avg/Total
1979-83:					
Freezing Point[1]	-.5440	-.5424	-.5414	-.5436	-.5432
(N)	44,163	49,950	50,511	49,800	194,424
ESCC[2]	353,000	384,000	469,000	419,000	406,250
(N)	52,190	43,283	42,247	42,514	180,234
1984-88:					
Freezing Point[1]	-.5462	-.5450	-.5444	-.5474	-.5460
(N)	23,649	22,063	18,989	18,836	83,537
ESCC[2]	358,000	367,000	420,000	365,000	377,500
(N)	15,567	20,514	16,884	16,359	75,976

[1] Degree Hortvet
2 Electronic (Coulter Counter) somatic cell count per ml

extent that regional and seasonal differences are additive in influence, such differences can mount to well over 1.0% added water.

Data in Table 1 also strongly suggest that the freezing point of milk supplies analyzed by Dairy Quality Control Institute, Inc. have decreased in recent years. The average for the first five years was -0.5432 °, for the second five years -0.5460 °H. To some extent such change might be due to improvement in somatic cell counts which, in turn, are known to be inversely related to lactose content of milk. Indeed, average somatic cell count of these milk supplies decreased from an average of 406,000 to 377,500 cells per ml. In addition, however, breeding practices must be considered to have resulted in some slight increase in lactose content over the 10-year span. Hence, good reason exists to believe that the average freezing point of milk is lower now than at the time of the Henningson study. In addition, the upper natural level freezing point--the level used by regulatory agencies--may well be lower now than in 1968, the time of the Henningson study. As a matter of conjuncture, if nothing else, assume that the change from the upper level freezing point calculated by Henningson (-0.525 °H) is directly related to the change in average freezing point and that the true average freezing point of Minnesota milk supplies is -0.5460 °H. The difference between Henningson's average and the new average freezing point is 0.5460 - 0.5404 = 0.0056. Adding the latter value to Henningson's upper base would result in a current upper base of -0.5306 °H (i.e. 0.525 + 0.0056 = 0.5306). Under these assumptions, the legal base for taking action in questions of water adulteration of milk becomes -0.531 °H. The ramifications are obvious.

It is inappropriate, perhaps, to take such leniencies in interpreting available data. Nevertheless, the trend in freezing point appears nonetheless valid, as does the potential issues the trend may raise.

Data in Table 2 show the annual average freezing point and somatic cell count of milk supplies by year over the 10 years, 1979-88. Although some small inconsistencies may be observed, the overall trend is toward lower freezing points and somatic cell counts. Again, these data strongly suggest that freezing point of milk supplies has not been a stable factor over the years. Not only have changes taken place at regular intervals, the data of Henningson now appear out-of-date and inappropriate for use as standards either for regulatory or field application. Furthermore, the data strongly suggest that changes in freezing point can be expected in the future. Such facts, it would appear, make less tenable the concept of a single universal freezing point standard for the nation as a whole. At best, the need to continually monitor freezing point seems essential in future use of this particular characteristic of milk as a method of determining adulteration with water.

Table 2. Annual average freezing point and somatic cell count for the ten-year period, 1979-88, by year.

Year	Freezing Point[1]	(N)	Somatic Cell Count[2]	(N)
1979	-0.543	32,536	370,000	42,705
1980	-0.543	42,675	480,000	44,067
1981	-0.543	43,571	410,000	44,020
1982	-0.543	40,159	435,000	40,777
1983	-0.544	35,493	421,000	35,876
1984	-0.542	32,428	413,000	33,054
1985	-0.546	18,980	390,000	20,022
1986	-0.546	11,233	350,000	13,283
1987	-0.548	10,683	350,000	9,617
1988	-0.548	9,013	350,000	5,680

[1] Degree Hortvet
[2] Electronic (Coulter Counter) count per ml

Table 3 provides data on the percentage of milk supplies evaluated by Dairy Quality Control Institute, Inc. that have met a standard of less than 0.2% added water over the 10 years analyzed in this study. A base of -0.540 °H was used for assessing percentage of added water, and those supplies that met or did not exceed a freezing point of -0.539 °H were considered to fall within the 0.2% standard.

Table 3. Percentage of herd milk supplies showing less than 0.2% added water by quarter-year over the ten-year period, 1979-88.

	Percentage of Supplies at <0.2% added water[1]					
Year	Jan.-Mar.	Apr.-June	July-Sept.	Oct.-Dec.	Annual Average	Total No. of Tests
1979	83.0	76.6	77.7	76.1	78.4	32,536
1980	81.6	73.7	63.0	75.1	73.4	42,675
1981	78.0	80.8	73.6	85.5	79.5	43,571
1982	87.2	79.3	75.1	86.5	82.0	40,159
1983	89.6	83.4	75.2	88.0	84.1	35,493
1984	75.7	78.9	70.3	83.1	77.0	32,428
1985	89.9	89.9	85.5	90.9	89.1	18,980
1986	93.4	91.5	85.5	90.9	90.3	12,433
1987	94.3	91.9	90.6	95.4	93.1	10,683
1988	95.0	86.3	92.4	92.0	91.4	9,013
Grand Average	86.8	83.2	79.1	86.6	83.9	

[1] The base freezing point used in generating these data was -0.540 °H, with -0.539 °H being the upper limit for supplies considered to contain less than 0.2% added water.

With but few inconsistencies, the trend is apparent. Percentage of milk supplies showing no more than 0.2% added water have steadily increased, from around 75% in the early 1980's to over 90% in 1988. During this period of time, however, the true average--in this case the true base--freezing point decreased. In fact, the true average freezing point even in the early 1980's was less than the average found by Henningson (2). Hence, while the standard applied in this analysis remained constant, the average freezing point was declining. To some extent, therefore, the percentage increase in milk supplies found to contain no more than 0.2% added water must be considered an artefact of the change in average freezing point of the milk supplies. That is, the true percentages embraced by the standard that was applied might well fall considerably lower than those shown in Table 3.

To explain the apparent anomaly, consider the true average freezing point during the early 1980's to have been, as shown in Table 2, -0.543 °H and, for 1988, -0.548 °H. The difference between -0.543 °H and -0.539 °H could account for as much as 1.45% added water: (0.543 - 0.539)/0.543 X 100 = 1.45%. The same calculation using the true 1988 average freezing point yields a value of 1.6%. In other words, an amount of water reaching to those levels could have been present in the milk supplies without breaching the -0.539 °H standard. And the percentage of milk supplies which, in reality, did not exceed 0.2% added water was undoubtedly less than the figures shown in Table 3. Such are the implications of the data reflected in the latter two tables.

In addition, data in Table 3 show definite seasonal trends, with lower percentage of milk supplies meeting the 0.2% standard in summer than in late fall and winter months. At first glance, it might appear that, for whatever reason, dairy farmers do a poorer job of keeping milk free of water during summer months. This may in fact be true, at least to an extent. However, the fact that the standard freezing point used in this particular analysis was held constant throughout the year, while, in reality, the average freezing point increased during the summertime, caused an artificial tightening of the standard for milk produced at this time of year. That is, the natural increase in freezing point in and of itself adds an "apparent" level of water even though no added water may have been present. The increase is proportionate to the actual rise in natural freezing point of milk. Data from Table 1 indicate a possible average increase of as much as 0.003 °H. At the base freezing point used in this case to assess percentage of milk supplies containing less than 0.2% added water, this difference is the equivalent of over 0.5% added water, i.e. 0.540 - (0.540 - 0.003)/0.540 X 100 = 0.55%. For this reason, precautions must be taken in interpretation of data such as that shown in Table 3. Even if a "true" average is used as a base throughout the year, the increase that occurs during summer months is meaningful. Using the 1984-88 data in Table 1, and assuming the average freezing point to have been -0.5460 °H, the average increase in freezing point that took place during summer months is equivalent to 0.29% added water (0.5460 - 0.5444/0.5460 X 100 = 0.29%). Such naturally occurring variables, therefore, tend to limit the usefulness of a "universal" freezing point standard. That is, a standard could be established based upon a new study of unwatered milk supplies or on the best current available evidence. But such a standard would always be subject to the vagaries of natural variations in freezing point, if not those caused by regional and seasonal differences, then possibly by failure to monitor milk supplies on a regular basis and to continuously alter the standard accordingly.

Conclusions

Some conclusions seem to evolve from this evaluation of historical data. They are:

1. The average freezing point of milk has not been stable over the years following the Henningson study (2), data from which continue to be used as a basis for determining level of water added to milk. In fact, freezing point has decreased, at least in the one region covered by this analysis and no doubt in other areas of the United States as well.

2. Seasonal differences in average freezing point of milk are significant and should be taken into account when evaluating herd milk supplies for level of added water.

3. Regional differences, possibly individual dairy plant differences, exist in average freezing point of milk supplies. These differences are significant and speak against the reliability and precision of interpretation of data that could be applied, on a local basis, using a nationwide "universal" freezing point standard in evaluation of percentage of added water. To the extent that economics demand minimal levels of added water, local (likely, individual plant) standards become that much more important.

4. There is reason to question whether or not the statistical upper base calculated by Henningson (and often used by regulatory agencies as a basis for taking legal action) is valid for contemporary supplies of milk. If the overall average freezing point of milk has decreased, the upper base may well be shown to have decreased as well. The implication is that regulatory action should perhaps be initiated at a lower freezing point level than is now the case. A further implication is that considerably more water may not be present in milk supplies prior to regulatory action than was the case in the late 1960's (at the completion of the Henningson study). Using the current average freezing point of milk analyzed by Dairy Quality Control Institute, Inc. (-0.548 °H) and the current upper base as determined by Henningson (and published in Official Methods of the AOAC), that is, -0.525 °H, it can be calculated that as much as 4.2% water may be present in milk of average freezing point prior to regulatory action being taken. Similarly, field action is likely not being undertaken at the most propitious time, i.e. prior to excessive levels of adulteration.

5. Further work seems necessary to elucidate more precisely the nature of the issues involved in establishing a universal freezing point standard or, for that matter, an individual dairy plant standard for use in assessing relatively small but meaningful levels of added water. A project that

may be useful in this regard is currently being undertaken by the authors.

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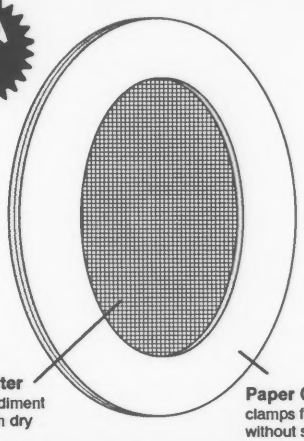

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Risk Communication and Food Safety

Elaine Auld, MPH, Director, Health Communications
International Food Information Council
1100 Connecticut Avenue, NW, Suite 430, Washington, DC 20036

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Recent concerns about the safety of domestic and imported produce have escalated into a broad crisis of consumer confidence in the food supply. The wholesomeness of dietary staples, such as fruits, vegetables, dairy products, meats, eggs, grains and even water, is being called into question. Americans have been painfully reminded that society is not risk-free, even when it comes to food. Although unsettling, these dramatic events are prompting federal officials and food safety experts to address the topic of risk communication. Risk communication is any public or private communication that informs individuals about the existence, nature, form, severity or acceptability of risks.[1] It addresses not only the transfer of information from technical elites to consumers, but also methods for relaying public concerns back to risk managers. Risk communication is an adjunct to risk assessment (the characterization of potential adverse health effects of human exposure to hazards) and to risk management (the process of evaluating alternative regulatory actions and selecting among them).[2]

Although a relatively new issue for food safety experts, risk communication has been a priority in environmental and occupational health arenas since the early 1980s. Community right-to-know laws, such as the Federal Hazard Communications Standard, expectations for increased community participation and burgeoning liability claims, have imposed new societal and organizational obligations for communicating about risk.[3] While risk communication sounds easy to accomplish, recent experience demonstrates it is exceedingly complex. This paper will address obstacles to effective food risk communication, including varying perceptions of experts and consumers about food safety, and will offer guidelines for improving the risk communication process.

Food Risk Perceptions

Perceptions of food risks held by most scientists and regulatory officials are vastly different from those of consumers. Since the late '50s and early '60s, consumers have tended to equate "natural" foods with goodness and wholesomeness and foods with added substances or chemicals as harmful. Public uneasiness about artificial ingredients appears to stem from the perception that chemicals cause cancer.[4] A 1988 Food Marketing Institute (FMI) survey revealed that 80% of respondents were somewhat or very concerned about the safety of processed food ingredients; 75% said they avoid buying certain foods because of safety concerns.[5]

For the last six years, FMI survey respondents have specifically rated pesticide and herbicide residues as the leading serious food hazard,[6] which in part may explain public outcry to recent produce events. Thirty-eight percent of respondents to a 1989 Gallup poll said the recent produce scares increased their worries that their food may be contaminated by pesticides or other toxic chemicals; 73% were in favor of using fewer pesticides and chemicals on foods, even if it means higher prices.[7]

Officials at the Food and Drug Administration (FDA) and U.S. Department of Agriculture (USDA), on the other hand, consider microbiological contamination to pose a much greater public health threat than pesticides and additives. This conclusion is also supported by 14 professional societies, representing more than 100,000 food technologists, toxicologists and other scientists.[8] Each year, up to a third of all Americans suffer from mild to severe cases of food-borne illness with costs to the nation and industry between $1 billion and $10 billion.[9] Increased virulence of certain organisms, more ready-to-eat imported foods, new food-packaging technologies and other factors have heightened the priority of microbiological safety.

Renowned biochemist Dr. Bruce Ames of the University of California at Berkeley also believes that the fear the public has of pesticides and food additives is ill-founded.[10] Ames states that improved detection of carcinogens with highly advanced methods does not mean that society is becoming more polluted or risky. Rather, it is the potency of a carcinogen and its level of exposure that determine the health risk of a substance. Ames estimates that Americans ingest 10,000 times more natural pesticides by weight than man-made pesticide residues.

A democracy implies that public groups and ordinary citizens have the right to express their will on health and safety matters. However, addressing such concerns can detract from other issues that have a greater potential for affecting public health. For example, allocating increased FDA resources for the detection of pesticide residues could result in less attention being devoted to food-borne illness, acquired immune deficiency syndrome and radon gas. There is also concern that focusing attention on less risky diet-disease issues may lead to "defensive indifference" or

a fatalism that "everything causes cancer." Consequently, controllable risks, such as smoking, will be ignored. Others worry that inundation with trivial risks or the "cry-wolf syndrome" could result in public underreaction to a subsequent serious risk like food tampering.[2]

Risk Communication Obstacles

The disparities between expert and consumer perceptions of food safety indicate some of the underlying difficulties in effective risk communication. In addition, there are problems related to interpretation of scientific findings, perceived credibility of risk communicators, conflicting risk messages and other areas that obscure the risk communication process. These obstacles may be analyzed from the perspective of source, message, channel and receiver of food risk communication.

Sources

A primary problem related to the source of food risk communication is disagreement among scientists, particularly on the diet-disease connection. Investigation into the relationship between diet and chronic disease is relatively new with most of the studies published in the past 25 years. Scientific debate continues on the role of diet in cardiovascular disease, cancer, osteoporosis and many other chronic conditions. As with any field of scientific inquiry, there is controversy among the experts some, of whom believe the weight of scientific evidence is insufficient to make dietary recommendations. Moore points out that such divergent opinions among scientific experts will always be present due to contrasting paradigms or mental constructs by which scientists are trained.[11]

Researchers also disagree on risk assessments, both how they are derived and their implications for public health. For example, the validity of contrasting risk assessment methods used by federal agencies and the Natural Resources Defense Council formed the basis for their opposing arguments on produce safety. While numbers of auto accidents and heart attacks can be measured more precisely, deaths due to chronic exposure to pesticide residues can only be estimated or extrapolated from animals to humans.

The number of food risk communicators, often with conflicting messages, also poses significant challenges. At the federal level, at least five different agencies are involved in food regulation and communications: the FDA, USDA, Environmental Protection Agency, Federal Trade Commission (FTC) and National Marine Fisheries Service of the Department of Commerce. As in California's Proposition 65, some states and local municipalities also are becoming active in food risk communication. Professional societies, non-profit associations, voluntary groups and consumer organizations further compete for limited public attention on food-related issues.

Lack of public credibility of the risk communication source also can impede risk communication. According to Kasperson, risk information is less credible if the communicator is viewed as being incompetent, having conflicting interests or having mismanaged or neglected risks in the past.[3] Kasperson cites public opinion polls indicating an erosion of public trust in major businesses and social institutions, including government, over the past decades. In one survey assessing believability that a food is safe or unsafe, consumers ranked the American Medical Association (AMA), their personal physicians, nutrition experts and the U.S. Surgeon General higher than FDA, USDA or the National Institutes of Health.[4] AMA's high ranking may be due in part of the perceived objectivity that the group represents as well as its perceived expertise in overall health matters. The lower ranking of government agencies may be due to their role in removal of certain substances from the market that they once believed to be safe, e.g., diethylstilbestrol. Groups ranked lowest in terms of believability, such as Congressional representatives and food companies, were viewed by respondents as lacking expertise in food issues or having vested economic or political interests.

Messages

Ideological differences between risk communicators and laypersons ultimately influence both the creation and impact of food risk messages. While scientists base their decisions on probabilistic thinking and quantitative risk assessment, consumers are influenced by cultural rationality, including prior experiences, folk wisdom and sociodemographics.[1] Slovic says consumers' attitudes are based on whether a risk is new vs. old, known vs. unknown, controllable vs. uncontrollable, voluntary vs. involuntary and potentially catastrophic vs. minor.[12] What matters to the public is not the size of the risk, but whether or not it is seen as acceptable. Mortality statistics are less important in the risk communication message than trust, credibility and fairness.

Risk communicators also tend to overemphasize the importance of scientific facts in their risk communication messages, assuming that consumer knowledge of a disease or condition will translated into desired health actions. Yet, as behavioral research has demonstrated, knowledge of a condition alone is insufficient for behavior change. For example, Rosenstock hypothesizes that the likelihood an individual will take action to avoid illness "X" is based on his or her perceived susceptibility to the illness, perceived seriousness of the illness, perceived benefits and barriers of proposed action and cues or stimuli to action.[13]

Channels

The media is the primary channel for communicating with the public about food risks and, as such, plays a major role in shaping public attitudes toward food safety. Competition among journalists, as well as scientists, often results in limitations of research being downplayed; the importance of one study being exaggerated or news becoming what science claims, not what is proven by scientific methods.[14,15] In attempts to offer a balanced story, reporters may seek out opposing viewpoints with little scientific credence. Few journalists have scientific backgrounds or have developed sufficient understanding of the scientific approach to

critically analyze research results.[11,14] Statistical probability, variability, replication of previous research and other important study parameters often are overlooked. Results from animal studies are interpreted as having immediate significance for humans.

Food advertisements are also primary channels to impart diet-disease information to the public. Since the 1970s, food manufacturers have increased the amount of advertising that promotes health benefits of particular products.[16] While many advertisements have helped improve the nutritional literacy of Americans, others have created confusion and have even been disallowed after FTC investigations or legal challenges. A final regulation on the use of health claims on foods has been pending in the Department of Health and Human Services since 1987.

Receivers

Within the last 30 years, scientists have become extremely sophisticated in developing analytical techniques to detect carcinogens at doses as low as one part per trillion. And yet, similar gains have not been made in allaying the public's fear of chemicals and cancer and improving their understanding of risk. Many consumers continue to believe that absolute safety of food is attainable.

One reason Americans expect food to be risk-free may be due to our plentiful food supply. In countries where there are chronic food shortages, food is considered a vital risk, that is, one essential for life. In our developed world, however, the abundance and variety of food is taken for granted because it is not traded off against any vital risk. Easy access to abundant food likely supports the belief that food consumption should involve no risks whatsoever.[17] Indeed, 64% of Good Housekeeping survey respondents acknowledged that they take the safety of foods for granted. In addition, the benefits of food, such as health, convenience and aesthetic appeal, are not considered. Although some scientists might rate health benefits as the primary reasons for food choices, hedonic benefits play a dominant role in societies with an abundant variety of food.[17] Recent data show that increased sales of poultry, fish and other healthful food choices have been accompanied by increased sales of high-calorie, high-fat products.[18]

Overcoming Communication Barriers

Having acknowledged these problems in food risk communication, what then are some guidelines for improving the process?

First, to be a valuable resource to consumers, keep abreast of current developments in food safety. Anticipate issues likely to generate future controversy, such as food irradiation or biotechnology. Research has found that information furnished early is likely to have the greatest potential impact on the decision making of the public.[19] Therefore, maintain well-organized and up-to-date resource files and request to be added to mailing lists of credible sources of food safety information.

Second, identify target audiences and assess their current and desired information needs about an issue. Determine each group's attitudes, beliefs and perceptions of the risk and the food information sources they hold as credible.

Third, shape risk communication messages to address the needs and characteristics of each target audience. For example, target audiences on pesticide issues may include PTA members, school foodservice directors, parents, physicians, supermarket produce managers, children and teens. Pilot test risk messages with individuals from the target groups.

Fourth, educate the public about food risks and benefits. Consumers must be reminded that society is not risk-free - even when it comes to food. Although zero risk or absolute safety is a laudable goal, it is unattainable.

Fifth, use risk comparisons of the same risk at two different times, comparisons with a standard or comparisons with different estimates of the same risk.[19] Avoid risk comparisons that mix voluntary risks with those that are involuntary; for example, comparing the radiation risk of a chest x-ray to that from a nuclear power plant. While the amount of radiation may be roughly equivalent, the chest x-ray is a voluntary risk, while the nuclear plant represents an involuntary risk.

Sixth, explain risk information clearly and concisely, using simple nontechnical language. Explanations involving two or three numbers are more meaningful than an excess of facts. Discuss actions being taken by federal agencies, companies or other groups to minimize public health risks as well as personal steps to reduce potential injury, e.g., washing and peeling fruit.

Seventh, be open and truthful. Acknowledge that individuals do not evaluate acceptability of risk based on size alone. Openly discuss data uncertainties and varying risk estimates. Always acknowledge that an illness, injury or death is a tragedy.

Eighth, establish relationships with local media. Conduct background briefings with reporters on food-related issues and provide sample copies of materials for their resource files. Assist journalists to critically assess new scientific findings and interpret them in the context of other results learned by scientific methods.

Conclusions

Recent events related to produce safety have highlighted the need for more effective risk communication on food safety. While most experts believe that microbiological hazards pose the greatest threat to food safety, consumers tend to be more concerned about pesticide and herbicide residues.

Effective risk communication is hampered by a variety of obstacles, some of which are rooted in the limitations of science and risk assessment methods. Other barriers, however, can be overcome if scientists and health professionals are sensitive to public concerns and interests and are open and truthful. Careful attention to the source, message, channel and receiver of food risk communication will enhance the ability of the consumer to understand food safety issues and make better informed food choices.

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Starting Your Rodent Elimination Program -- Good Advice for Food Facilities

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There are seven key steps to starting and establishing an effective rodent elimination program in a food facility -- whether in a supermarket, a food distribution center, or in a food processing plant.

1. The food facility must be responsible for eliminating rodents. Your facility should certainly be visited regularly by an exterminator. We prefer monthly visits only, as more frequent visits are wasted money, and often cause complacency in the exterminator, causing him to do a worse job. You'd think that, since you are paying him for it, that rodent elimination is his responsibility.

Unfortunately, rodent infestations in a food facility are a sanitation problem, and can't be solved by an exterminator alone. Nor can they be solved without him! If any problem calls for a team approach, this is it. If you leave elimination of rodents by use of traps to your exterminator, you'll find that he needs to spend as much as 20-40 hours a week in your plant placing traps, checking them, and cleaning up new rodent evidence. At an average exterminator cost of $40 per hour (and in many areas it's higher), you'll be spending as much as $6,400 per month to eliminate rodents. Clearly, that's not acceptable. (If it is, please give *me* a call for immediate service!)

However, since trap placement is a fairly simple job, once you learn a few tricks, and because it requires no license of any kind, it can be done by one of the maintenance personnel in your facility. At $5 per hour, it might cost you $800 per month. That's still a high figure, but if your facility is *that* infested, you'd better face the fact that you're not going to get out of this cheaply. Cheap is what gets you *into* this kind of mess! Besides, considering that *one day's* closure by a health agency can cost you $80-$100 thousand in lost sales (not to mention cleanup costs, lost customers, adverse publicity, etc.) and the fact that closure may be longer than one day (weeks to months, in some cases) it's not so bad. Besides, when the rodent activity decreases, you can cut back on the scheduling (but not too much!)

In spite of your need to self-direct your rodent elimination program, I don't recommend that you try to do it without an exterminator. He can be of great use to you as a "fresh set of eyes" to find areas of rodent activity you overlooked, and as a source of information, guidance on eliminating rodents, and as a source of rodent traps at or near cost. It's very easy to use hundreds of dollars in glueboards when you're in the midst of a rodent infestation, so you should have a wholesale source like an exterminator. Or he can order traps like Ketchalls or Tin Cats, which are also very effective in rodent elimination.

2. One individual is to be the food facility's authority on rodent removal. As this job is best done by someone in your maintenance area, this is probably the best place to recruit a "mouse maven." Personnel from other departments usually look down on this kind of work, and shirk it. A maintenance person, assuming he or she is properly motivated, can be shown that this is an opportunity to show his responsibility in a quantifiable are (since maintenance is often considered a "cost center" compared to other departments' profit centers, maintenance crew members don't have much chance to "show their stuff."

This selected individual should also be required to report to the operations, store, or plant manager daily. This reporting will keep management up to speed on the rodent battle and also lends prestige and motivation to the "rodent authority."

He should be properly trained, and have access to management, the exterminator, and to the pest elimination supplies at all times. He should also be responsible for charting all rodent activity in the store.

3. Charts must be kept of areas of rodent activity, amounts of rodent activity, and locations of all traps. These charts are highly confidential, and must never be shown to health agency representatives, as they are admissions that your store is in violation of the health code. They are necessary so that you can track declines in rodent activity in various parts of your facility (a food facility infestation is actually made up of a number of smaller rodent infestations), but remember to keep the charts under **lock and key.**

4. Cooperation must be gained from other departments. You can put traps down forever, but if a grocery department doesn't remove a massive deadstock condition, you will always have rodents living in the deadstock. A receiving department that doesn't get product into its slots quickly enough can cause the same problem. Or a dairy department that doesn't clean its refrigerated cases on a regular basis will feed numerous rodents on the food debris in the bottom of the case.

5. Avoid use of rodent baits. For one thing, the only baits that a food facility employee without a pest control opera-

tor's license can use, would be a warfarin bait, like D-Con. These baits require that a rodent eat them alone for 4 or 5 consecutive days to work. In a food facility there are too many other, more attractive food sources for these to be effective. Any other poison bait must be handled by a licensed exterminator, thus increasing your service costs (remember $40 per hour versus $5?).

Second, if rodents take the bait, and enough of it to die, *you* don't control where they die. *They* do. Such as in the middle of your sales floor, processing area, or right in font of a health inspector. We've seen them all happen.

Third, if a rodent dies out of sight, it'll be the source of odor and insect problems--and that could be worse than the original rodent problem. In addition, stored product insects can develop in abandoned or forgotten cereal-based rodent baits, and spread to other foods in your facility. In many cases, this stored product insect infestation is *more* difficult and expensive to eliminate than most rodent infestations!

Fourth, there's really no legal way you can use poison baits in a food facility--you'll certainly never see them in USDA inspected facilities.

Fifth, as mentioned before, baits, which mimic food to rodents, are never as attractive to them as the food you stock in your store or plant--you advertise its freshness every week!

Sixth, you're far better off knowing how bad a rodent problem is at any point by catching and counting each rodent, in order to justify the extra expenses you're going to generate in eliminating them. If you spend a couple of thousand dollars in rodent elimination and have nothing visible to show for it, you may encounter resistance from your supervisors. On the other hand, if you can show (from your charts) that you've caught two hundred mice in the last week (and that's often the case), you'll have an easier time justifying the expenditure.

In the old days, exterminators, invariably called "The Ratman", would gas rat burrows outside a food store, restaurant, or food plant, and line up the rat carcasses on the grass for the manager to admire, and then receive a buck or two per rat in payment. I suppose the phenomenon is the same, but people want to see what they're paying for in the field of rodent elimination, as elsewhere.

6. Your goal should be perfection. Remember that if rodents leave 10,000 droppings along a wall, and you clean up 99%, then you've still left 100. That's more than enough to get you in trouble with a health agency. Similarly, if there were 600 mice in your food facility (it happens) and you eliminate 99.7% (and that's more pure than Ivory Soap!), you've still left two mice. If one is female and the other male, and they get together .... well, approximately 20 days later you can have a litter of 8 baby mice. The next month 16, the next month as many as 56, until, after 6 months you could have as many as 1,490 mice in your plant.

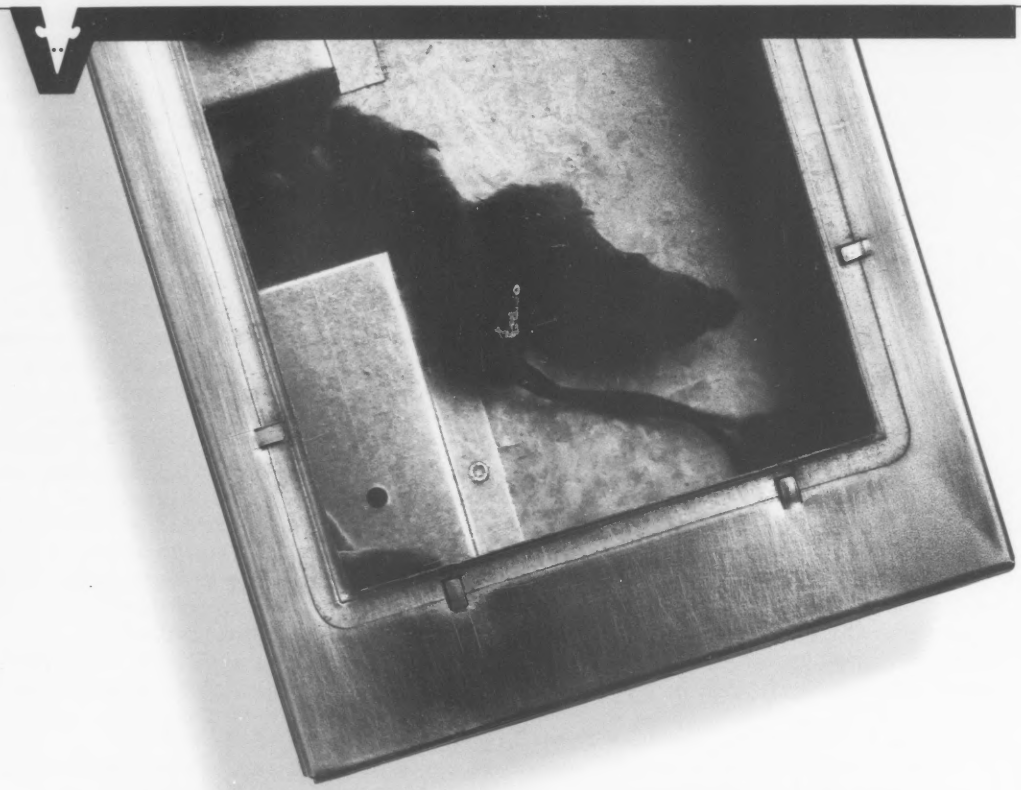
Of course, by that point you'll know that you have another infestation, as your employees will be running them over with pallet jacks and hi-lows, and your customers will mention to you that they think you might have a problem.

On the other hand, we charted out the amount of rodent activity generated in a food facility that was "cleaned out." Every rodent was hunted down and removed, and further rodent entry was closed off. After one month there were zero rodents, and after six months that number had remained at zero. Needless to say, it's easier to deal with zero rodents than 1,500! So eliminate them all the first time, and save yourself a great deal of future trouble.

7. Learn your lessons. It's not so much a lack of rodent extermination that causes a rodent infestation, as it is poor sanitation. Even the best run food facilities get rodents entering the plant or store occasionally. The difference is what happens once the rodent enters. In the well-run, clean and sanitary facility, nothing is stored along the walls, or directly on the floor. When the rodent enters, he runs along the wall looking for a place to hide. Not finding it, he continues running. Eventually, he'll blunder into a trap and get caught. Since this is a new environment to him, he's likely to be caught whether he's a mouse or rat. And that'll happen even though rodent traps in a well-organized food facility may be 70-100 feet apart. We recommend 40 feet maximum.

In the disorganized facility, the entering rodent will run a short distance along that same wall until he gets to a pallet or dolly of product, or a piece of equipment that's not in use. (How many times has someone place a hollow pipe bannister from the receiving dock, or a wall or case guard, long and hollow, along your back wall and forgotten about it? Go on, go back and take a look. I'll wait .... see, it happens all the time!). So, even when the disorganized facility uses three times as many rodent traps as the organized store, rodents still survive better in the disorganized store, because they never get to the traps!

I see these as the Seven Commandments of Rodent Elimination -- without them, rodent elimination is a long, tiring, expensive, and ultimately, frustrating, exercise.



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News

Higher-Protein Milk can Increase Farmers' Profits

The value of the protein content of milk is increasing relative to the value of its fat content. Dairy producers should keep this trend in mind as they choose sires, according to Joe Conlin, extension dairy scientist at the University of Minnesota.

"There is increased world and U.S. demand for nonfat dry milk, and less demand for butter and milkfat products," says Conlin. "This suggests a need to emphasize protein content and cheese yield in the milk of daughters as sire selection factors."

It is important to look at protein and cheese yield in terms of total pounds per lactation, and not as a percentage of the milk, says Conlin. He suggests using bulls rated in the upper 25 percent of the breed in terms of the protein and/or cheese yield of their daughters' milk.

"In most cases, cows producing the most pounds of milk will also produce the most pounds of protein, but this isn't always true," he points out.

Conlin says government supplies from commodity purchases have dwindled to nothing for cheese and dry milk, but the government still has a large supply of butter.

Changes in the government price support system for dairy products, which began in January 1989, have bolstered the value of dry milk relative to butter, says Conlin. The government dropped the purchase price per pound of butter by 8 cents and raised the price of dry milk by nearly 7 cents per pound in January 1989. Adjustments last April and last July and also this January added further to the value of dry milk relative to butter.

"These price adjustments have not yet had a major influence on the prices dairy farmers receive, because milk prices have been well above support price levels," says Conlin. "However, the price differential for butterfat in most farm-level milk checks either changed very little or declined in the face of increasing milk prices during 1989. As milk prices drop to the support level, the influence of the differential will be much more noticeable."

Conlin says, many milk processors are already paying a premium for high-protein milk. He predicts that in the near future there will be legislative efforts in Minnesota and other states to allow price discounts when protein is below a certain level.

"Price differentials based on protein content are likely to be incorporated into federal milk marketing orders within the next three or four years," he said.

For more information please contact Joe Conlin at (612)624-4995.

Improved Milk Quality Results in Impressive Pay-Offs for Industry

When the dairy industry works diligently at improving milk quality, it usually results in some impressive pay-offs for the industry, including improved public health and food safety, improved milk composition (including both a better nutrition profile and enhanced manufactured product yields), increased milk production per cow, and, hopefully, increased dairy product sales.

That was the theme stressed in a presentation on milk quality by Floyd W. Bodyfelt, extension dairy processing specialist at Oregon State University, during the recent Wisconsin Dairy Field Representatives Conference in Madison.

"We must apply the more consumer- and people-oriented concepts of quality assurance in the selection and implementation of the most sensitive and relevant quality monitoring tools we have available," Bodyfelt said. "High quality milk and milk products, in terms of good flavor attributes and reasonable shelf-life, certainly helps sell more milk. Most of all - it helps us retain the dairy foods sales we already have."

He said, we should always bear in mind the first rule of quality assurance: "A milk product can be no better than the quality of the raw materials that went into it."

The best tests (parameters) for determining raw milk quality, Bodyfelt said, include:

•Flavor: Odor, taste mouthfeel and occasionally color and appearance. Undoubtedly, flavor is the most important yardstick for consumer acceptance of milk. Moderate and serious off-flavors in milk at the farm bulk tank level must be avoided. Taste and odor (plus shelf-life) are the only "yardsticks" the consumer will ever use to evaluate milk quality.

•Farm inspection (visual observations): An organized set of visual observations conducted by a trained and experienced sanitarian (regulatory agency), industry field representative or extension dairy specialist of management practices of milk harvesting, transferring, storage and overall sanitation and housekeeping. This is most informative in ascertaining potential milk quality.

Bodyfelt listed several tests for evaluating raw milk quality from a microbiological standpoint:

•Standard Plate Count (SPC): A highly standardized procedure and media is used to estimate the total aerobic, viable bacterial cell count of an aseptically collected fresh, raw milk sample. The SPC concerns itself with: (1) total live aerobic bacteria, but (2) not necessarily the kinds of bacteria present, and is historically required for (3) public

health reasons (official). Regulatory SPC count maximums are 80,000 to 100,000/ml. SPC counts of less than 20,000/ml are highly desirable. In some Quality Incentive Payment Programs (QUIPP) the target is 5,000 or 10,000 bacteria/ml.

•Preliminary Incubation (PI) Count: This is simply another approach for conducting the SPC. A raw milk sample (producer or milk tanker) is held for 18 hours at 12.8 degrees C (55 degrees F). Then the sample is subjected to a SPC. This is an effective procedure for indicating presence of psychrotrophic bacteria (spoilage type) and, hence, good evidence of sanitation shortcomings in milk production and storage. In essence, the PI count is a "measure of 'lasting' quality," since it "shows up" the presence of unwanted spoilage bacteria. These cold-loving bacteria often produce proteolytic enzymes (proteases) that can survive pasteurization and subsequently limit fluid milk shelf-life or adversely affect cheese yield. Whenever PI counts exceed more than three or four times the fresh raw SPC, or when the PI exceeds 50,000 cfu/ml, the "trouble spots" of contamination source need checking.

•Laboratory Pasteurization Count (LPC): Raw milk samples are essentially subjected to a simulated vat (or batch) pasteurization procedure in a laboratory water bath. LPC results in excess of 500 (or 300) CFU/ml indicate the presence of bacteria that most likely would survive the pasteurization process (thermodurics). This procedure has lost some favor in recent years; other microbiological tests are more critical.

•Test for Heat Resistant (Sporeforming) Psychrotrophs (HRSP): This recently introduced test is a modification of the LPC that looks for thermodurics that are also able to grow at refrigeration temperature (psychrotrophic). This test is based on heat treating the raw milk sample to 80 degrees C (176 degrees F) for 10 minutes, quickly cooking the sample, storing for 10 days at 7.2 degrees C (45 degrees F) and then SPC plating. A HRSP count in excess of 10 CFU/ml is indicative of potential shelf-life problems or reduced cheese yield. HRSP counts in the range of 0-10/ml are preferred; no spores at all would be ideal.

•Coliform (plate) Count: A differential media is used to enumerate this group of Gram-bacteria that originate from the intestinal tract of warm-blooded animals (Eschericia coli and Aerogenes sp.). The coliform count is an excellent "index of the level of sanitation." An occasional standard for raw milk is less than 100 coliforms/ml. This test is infrequently applied to raw milk; it is more applicable to pasteurized products (less than or equal to 10/ml).

•Direct Microscopic Bacteria Count (DMC): The DMC is a good screening test since the results are obtained rapidly. The DMC often provides an indication of the cause of the sanitation problem, since a trained and experienced technician can ascertain the general types and/or range of bacteria present when a Gram stain is used. However, this method is only effective for undesirable, "high count" milk (300,000 bacterial cells/ml).

•Other microbial procedures: Previously, procedures were employed to "indirectly estimate the bacterial population of raw milk samples; this was done most often by measurement of the "dye reduction" capability of a given sample. Dye reduction tests such as methylene blue and resasurin (reduction times) and crystal violet or tetrazolium salts have been employed. Other approaches have involved measurements of catalase, oxidase, pyruvate and/or ATP production, psychrotrophic bacteria and electrical impedance measurements of media (as the result of microbial metabolism). The latter lends itself to automation, computer control and display/printing results.

Bodyfelt noted that there are also several other quality tests for raw milk, including:

•Antibiotics: Numerous laboratory methods have been developed to determine the presence or absence of antibiotics in milk. The Bacillus subtillis or B. Stearothermophilus plate disc test is the "official" method for detecting approximately 0.02-0.03 I.U. of penicillin or other beta lactam forms of antibiotic. There are several other methods available for antibiotics detection as well. Any source of antibiotic positive milk can pose serious human health, economic and aesthetic problems.

•Somatic Cells (SCC): One of the best indicators of the normal composition of milk is measurement of the leukocytes and epithelial (somatic or body) cells in milk from a given herd (bulk tank). Somatic cell counts in excess of approximately 300,000/ml are generally indicative of some degree of mammary system(s) infection by pathogenic microorganisms (mastitis). Elevated somatic cell counts in milk mean: lost milk production; reduced cheese yields; flavor deterioration; and shelf-life reduction. Oregon was the first state to invoke a maximum somatic cell count of 750,000/ml (July 1, 1987). The federal standard is less than or equal to 1,000,000 SCC/ml. Somatic cells are counted by either the direct microscopic (DMCC) procedure or an electronic device, or by indirect estimation (Wisconsin or California Mastitis Tests).

•Freezing Point Determination: The most consistent property of milk is the freezing point (less than or equal to minus 0.30 degrees C or 31.5 degrees F). This is a quite precise method for determining the addition of water to milk (which is illegal and unethical). Each increase of 0.006 degree C in freezing point of milk is indicative of approximately 1 percent added water, whether accidental or purposeful.

•Titratable acidity (%T.A.) and pH: The buffering components of milk exhibit a "baseline acidity" and a slightly acidic pH of 6.6-6.8. Delayed or inadequate milk cooling often permits the growth of lactic acid bacteria and formation of lactic acid, which is responsible for sour taste and possible milk coagulation. This can be detected by the T.A. test. Normal fresh milk (depending on the breed and the milk solids content) exhibits an "apparent acidity" of

0.14-0.17 percent acidity (as lactic acid). A milk T.A. of 0.20 percent or higher can generally be detected by taste. When T.A.'s are less than 0.135 percent, we should be suspicious of alkali producers (i.e. psychrotrophs or spoilage bacteria).

•Sediment: The amount of unwanted extraneous material (dirt, soil) in milk can be objectively quantitated by the disk filtration method. The disks (with any possible filtered, insoluble sediment) are compared to standards and assigned an appropriate grade number (No. 1,2,3 and unlawful). Sediment grades of 1 and 2 are only acceptable in milk quality premium programs.

•Temperature: "Life begins at 40!" 40 degrees F (4.2 degrees C), that is, for the growth of spoilage (psychrotrophic) bacteria. Legal standards require that milk be cooled to 50 degrees F within one hour after completion of milking and to 45 degrees F within two hours after milking. Preferred quality standards for milk cooling are to 45 degrees F within one hour and to 40 degrees F or less within two hours; and no tank blend temperatures in excess of 45 degrees F. Rapid cooling and holding at 35-38 degrees F of raw milk is critical for maximizing milk quality and potential shelf-life. This limits the outgrowth of any potential psychrotroph bacteria. Recording thermometers (required in some states) effectively monitor critical temperatures of milk in farm bulk tanks.

The flavor of milk and other dairy products is the key to consumer acceptance, Bodyfelt noted. Endless numbers of laboratory analyses do not measure the true "eating quality" of a dairy product.

Flavor refers to that sensation perceived when a food or beverage is place in the mouth. Flavor characterization of a given substance is determined by the fundamental human sensory reactions of aroma, taste, mouthfeel, appearance and for some foods, sound.

The art of competent detection of abnormal flavors and/or odors in raw milk supplies and finished dairy products is an invaluable quality assurance tool, Bodyfelt said. The correct diagnosis of the source of a dairy product flavor quality problem is "absolutely necessary" before remedial measures can be taken.

Generally, three methods of tracing the cause of a flavor/odor problem are available: sensor evaluation, chemical tests, and microbiological tests. The easiest, simplest and quickest approach to quality assessment is the sensory method. Any person trained in flavor evaluation has a distinct advantage over the employee competent only in the other methods, Bodyfelt said.

The most important requirement of a thorough quality assurance program is careful flavor evaluation, screening and - if necessary - rejection of certain milk supplies. Again, he emphasized, dairy products can only be as good as the raw materials from which they are made.

The tasting of raw milk samples at any time or place requires an individual decision, Bodyfelt said. Many persons will not taste raw milk samples for good, sound, food safety and health reasons. In the name of expediency, however, many dairy technologists, when necessary, do taste (and quickly expectorate) raw milk samples. Bodyfelt said he occasionally carefully tastes commercial raw milk samples for purposes of trouble-shooting a given milk supply problem.

There is a solution to this dilemma, he said: lab pasteurize the samples at 155 degrees F for 10 minutes, then cool to 60-70 degrees F (or 80-90 degrees F) before checking flavor.

One cannot effectively evaluate milk samples for flavor quality when the samples are checked at temperatures below 50 degrees F, Bodyfelt pointed out. Any potential off-odor or off-taste in a milk sample is more readily detected after tempering to 60-70 degrees F. The milk judge can better qualitate and quantitate odors at this temperature. The technique calls for briefly swirling the sample container, then taking a full "whiff" of air and possible volatile constituents.

A more effective technique, Bodyfelt said, is to temper the samples to 80-90 degrees F. The higher temperature serves to more completely volatize any potential off-odors and to emphasize unwanted odor notes.

The most difficult decisions for milk judges, Bodyfelt said, are those borderline cases, instances of sub-par flavor quality where outright rejection of the milk cannot be clearly demanded. Bodyfelt said, he believed that these flavor cases tend to get worse before they get better.

If the person responsible for milk reception has any doubt or question about the acceptability of a tanker of milk, he or she should get a second or third opinion from other competent personnel, Bodyfelt said. It helps if the most discriminating person(s) for detecting and identifying off-flavors is available at this point.

Consumers more readily identify with the flavor dimension of milk and dairy products than with any other measures of product quality, such as bacteria counts or composition analysis, Bodyfelt noted. The progressive quality assurance-minded dairy processor must be more familiar with the shortcomings (and merits) of his products than his customers.

Key personnel must aggressively apply the best, fastest, and simplest yardstick of milk quality - flavor evaluation - at the plant receiving platform, Bodyfelt said. These personnel must be competent and fair. They must possess good judgment and must be capable of the professional strength needed to reject a tanker of milk.

Reprinted from The Cheese Reporter, Madison, WI

Using Oxytocin to Increase Milk Production is Illegal

Dairy producers should not inject lactating cows with oxytocin to increase milk production. Such use of this compound is illegal, says Jeff Reneau, extension dairy scientist at the University of Minnesota.

Oxytocin is a natural protein hormone that causes cows to "let down" their milk. All lactating cows have some oxytocin in their bloodstream at milking time.

"Two years ago, researchers at Cornell University in New York presented preliminary finds of a study on oxytocin," says Reneau. "This preliminary report indicated injections of oxytocin at each milking increased milk production 10-12 percent in one herd of 73 cows. Their final report on the study is still in the review process and has not been officially reported in the *Journal of Dairy Science*."

Reneau says the study has not addressed some important questions, including how or why the oxytocin increased milk production. Previous studies using oxytocin injections at each milking have not resulted in the positive results found in the Cornell study.

He cites the following problems with using oxytocin to increase milk production:

•Such use is, in the strictest sense, illegal. Oxytocin is a prescription drug approved for therapeutic use only. "The Food and Drug Administration has made it clear that it is illegal to prescribe oxytocin for routine use as a production aid," Reneau points out. "This is mainly because the appropriate studies necessary to get FDA clearance for this usage have not yet been conducted."

•There have not been any studies of the long-term side effects of oxytocin. Reneau says, "We know, for example, that under certain circumstances unwise use of this compound can impair reproductive performance. There also is some question about how routine injections might affect the cow's ability to produce and respond to her own oxytocin. The potential exists that a cow might become dependent on injected oxytocin to achieve efficient milk letdown."

•Oxytocin would have to be injected at every milking, which is an obvious inconvenience.

"Clearly, much more work is necessary before use of oxytocin as a production enhancement aid can be either confidently or legally recommended," says Reneau.

He adds that veterinarians should prescribe oxytocin only according to its label instructions and should carefully consider the legal implications of prescribing the compound for any other use.

Agricultural Technology, Marketing and Our Food Supply

Recent speeches by three of American Cyanamid Company's Agricultural Division executives address the interrelated effects of advancing agricultural technology, changing marketing patterns and concerns with the safety of America's food supply.

In a talk presented during the Annual Pest Management Conference at Cornell University, Dr. Mark W. Atwood, vice president of Cyanamid's Agricultural Division, spoke about the role of biotechnology in helping U.S. farmers compete in a global economy.

Using the definition of biotechnology as "applied biological sciences," Atwood pointed out that farmers have been using biotechnology for thousands of years, since animals were first domesticated and the best seeds were chosen for planting.

Today's more sophisticated applied biological sciences have the same goal as earlier methods--to provide abundant, high quality food and fiber at low cost.

Atwood noted that as agricultural technology spreads around the world and more countries gain the capability to compete, American farmers will have difficulty staying on top of the market if modern biotechnology and other advances in plant and animal science are not used to their maximum advantage.

"Unless we invest in new technology, and allow farmers to utilize it, we put the very foundation of American greatness in jeopardy," he said.

William F.R. Griffith, III, vice president and general manager of Cyanamid's Crop Protection Chemicals Department, discussed marketing agricultural products in a changing social, economic and technological environment at the American Marketing Association Agribusiness Market Research Conference in Washington, D.C.

Griffith pointed out how industry economics have influenced the consolidation of agricultural supply and distribution channels, and have forced several basic manufacturers of off-farm inputs to merge with other companies or go completely out of business.

Emerging technology has also encouraged unique new alliances--between leading herbicide manufacturers and seed companies, for example, and agricultural chemical and equipment companies. Such alliances create new competitive balances in the marketplace.

Perhaps one of the most significant marketing challenges faced by the industry, Griffith noted, is public demand for "zero risk" to human health and the environment. The demand for "absolute" safety, he stressed, must be balanced by consideration of the many benefits resulting from agricultural technology.

"Our world is changing," Griffith said. "The challenge is to adapt our marketing to the changing environment, to preserve and expand our competitive capabilities and maintain our global leadership in food and agriculture."

The safety of America's food supply was the subject of a talk given at the Delta County (Colorado) Farm Bureau Annual Meeting by Fred W. Gutzmann of Cyanamid's Animal Nutrition and Health Department.

He discussed how political activists have managed to scare the public into believing that almost every food--from grapes and apples to peanut butter and milk--is a threat to human health. "Rumors about food hazards spread quickly," Gutzmann noted. "Today, they're halfway around the world before the truth gets its boots on."

He stressed the importance of educating the public about the scare tactics used by activists and relaying the truth about the U.S. food supply--it's the safest, healthiest, most reliable, affordable and enjoyable in the world.

"We tend to take American agriculture's amazing accomplishments for granted," Gutzmann said. "Only two percent of the population feeds 240 million people--over 700

million meals a day, 260 billion meals a year."

Cyanamid has distributed several thousand reprints of the three speeches to trade publications, farm broadcasters, agricultural editors, producer and commodity groups, extension agents and farm store dealers across the country. A limited number of additional copies are available on request.

Cyanamid is a research-based biotechnology and chemical company which develops medical, agricultural, chemical and consumer products and manufactures and markets them throughout the world.

For more information contact: David Crosson (201)831-2755 or Nick Kalm (201)831-3877.

Carvel Corporation Appoints Steven V. Fellingham as Chief Executive Officer

Savio Tung, acting CEO of Carvel Corporation, a leading franchiser of ice cream products, announced today that Steven V. Fellingham has been appointed as chairman and chief executive officer of the company.

Fellingham, aged 44, previously served as president of Kentucky Fried Chicken USA, where he was responsible for the overall management of the company's domestic stores and revenues.

Savio Tung, who is also a member of the management committee of INVESTCORP, the new owners of Carvel, said: "We are delighted that Steve Fellingham is joining Carvel. We conducted an extensive search to find someone with outstanding franchising experience and we have found the best executive there is." He added, "Fellingham will assure that strategic plans for the expansion and growth plans of the company will be developed and implemented in the most effective way."

Savio Tung will remain at Carvel as a board member. Tom Carvel, former chief executive of Carvel, will remain as consultant and advisor to the company.

Mr. Fellingham, commenting on his new position, said: "This is a terrific opportunity. My immediate objective will be to help everyone associated with Carvel's historic success reclaim this brand's rightful position as the number one ice cream chain in the East. The longer-term opportunity is even more exciting. We have a well known and popular Landmark, supported by a reputation for quality products

Steven V. Fellingham

and historical product innovation; this is a business combination that can be translated into national and even international success. I am anxious to meet with franchises and current management to seek their advice and counsel on development strategies and operating philosophy."

Mr. Fellingham will host a franchise convention in early May. Together with INVESTCORP he will formally introduce the new advertising campaign and will have many meetings with the franchisees.

A native of New York City, Fellingham received a Master of Business Administration from Lehigh University in 1973 and a Bachelor of Science from Queens College in 1967. Fellingham's successful sixteen year career at Kentucky Fried Chicken began in 1974 and included past positions of president/KFC International; vice president-Western Hemisphere/KFC International; vice president finance-International/KFC International, and controller/International Division.

Fellingham also served as president of QSR Specialty Companies, owned by RJR Nabisco, former owner of Kentucky Fried Chicken. Fellingham began his career in the New York office of Price Waterhouse.

For more information contact Robyn Cohen (212)704-8166 or Amanda Duckworth (212)704-8108.

Updates . . .

A Reason to C.A.R.E.
June is National Pest Control Month

The month of June is generally a favorite of many people. Many brides prefer their weddings in June; and more families like taking their vacations in June. And while the pest control industry favors June as National Pest Control Month, people all over the country also quickly realize that June is their least favorite as the silent society of insects crosses the line from just being a nuisance to a real pain of a pest.

In addition to this year's observance is the inaugural Chemical Awareness in the Residential Environment (C.A.R.E.) Project. The project's purpose is to inform the public of the variety of toxic chemicals that are found in their residences, and the industry's sharing of knowledge on the proper handling and storage of these substances to safeguard our environment and prevent accidents. The majority of the 1.25 million accidental poisonings each year occurred in the home and involved children between the ages of 18 months and 4 years old.

President George Bush in a special Presidential message sent to the National Pest Control Association, took special interest to record the project's objectives: "By educating the public about the health threats posed by household pests and by encouraging consumers to handle pest control chemicals carefully, in accordance with directions, members of the Nations's pest control industry are rendering an important service to the public. I applaud these efforts and thank you for responding to heighten environmental concerns."

The National Pest Control Association began this pest control awareness month in 1973 as part of a nationwide effort to inform Americans to the importance of effective pest management to the protection of society's health and property. Unwanted pests destroy up to 50 percent of the food crops in underdeveloped countries cause over a billion dollars of damage to homes and buildings and transmit 15 major disease causing organisms. The pest control industry's importance to the nation as a whole is considerable. It would be difficult to find any segment of the food industry which could comply with federal regulations for sanitation without an adequate pest management program.

Pest control firms annually service more than 12 million homes, 240,000 retail food establishments, 400,000 commercial restaurants and kitchens, and 55,000 hotels and motels, nationwide.

Sulfamethazine

Mastitis makes my bag so tight
It hurts so bad; Can't sleep at night

Sulfamethazine, Sulamethazine
How did you get in my udder?

He gave me drugs to cure my ills.
He gave me shots and big red pills.

Sulfamethazine, Sulfamethazine
How did you get in my udder?

He sold the milk; what was the harm?
They found it there; They used the Charm

Sulfamethazine, Sulfamethazine
Are you really in my udder?

If it's really there; It' just a trace.
But the media blitz, we can't erase.

Sulfamethazine, Sulfamethazine
Are you really in my udder?

Please restore my name so pure.
Assure the world my milk is clear.

Sulfamethazine, Sulfamethazine
I don't want you in my udder.

**To be sung to the tune of Old Christmas Tree.
Submitted by R.H. Schmidt, Food Science & Human Nutrition, Univ. of Florida, Gainesville, FL.

Food and Environmental Hazards To Health

Surveillance for Occupational Lead Exposure - United States, 1987

Since 1981, four states (California, New Jersey, New York and Texas) have implemented surveillance systems for occupational lead exposure. Although the details of these systems differ, each state requires any laboratory that performs blood-lead assays to report all elevated blood-lead levels (BLLs) to the state health department (SHD). The SHD then uses telephone follow-up (with either the physician who submitted the blood specimen or the patient) to obtain demographic information and identify possible occupational lead exposures.

This report summarizes 1987 surveillance data from these states on adults with BLL ≥40 µg/dL of whole blood. A person was counted as a case-patient only once, even though some persons may have been reported several times within the year. The highest BLL reported for each person (peak BLL) was used for this report.

For 1987, 1926 adults with elevated BLLs were reported to the four SHDs; for 524 (27.2%) persons, BLL exceeded 50 µg/dL.* Most (93%) elevated BLLs occurred in males, and most (94% [excluding New Jersey, for which specific data were not available]) were work-related. The age distribution was similar in the four states; the greatest proportions of persons with elevated BLLs were aged 25-34 and 35-44 years. In California and Texas, 44% and 40% of reported persons, respectively, were Hispanic; in contrast, Hispanics represent approximately 24% and 25%, respectively, of these states' populations (Bureau of the Census, unpublished data, 1988).

Elevated BLLs were most common in workers employed in industrial sectors with well-known lead hazards, such as primary and secondary lead smelting, brass foundries (both Standard Industrial Code [SIC]33), and battery manufacturing (SIC 36). Less common sources included: construction (including bridge reconstruction and home rehabilitation), ceramics manufacture, plastics production, stained-glass window production, ammunition manufacture, and firing ranges (both for sport and law-enforcement training).

Case follow-up efforts vary by state, but all attempt to 1) confirm occupational lead exposure by gathering more information about work history, hobbies with possible lead exposures, symptoms, and household contacts from the affected person or the reporting source, 2) provide educational and technical information to affected workers, attending physicians, and employers, and 3) arrange onsite evaluations of the lead hazard. Follow-up procedures may entail telephone contact with all newly reported workers, telephone contact only when a threshold BLL is exceeded, or telephone contact with the initiator (physician or employer) of the blood-lead test. Educational materials may be mailed to affected workers (and their physicians) or may be distributed to all lead-exposed workers when worksite inspections are conducted.

Worksite follow-up visits, including industrial hygiene evaluations, are part of each state's program. For example, the New Jersey Department of Health conducted 54 worksite visits from October 1985 through May 1989. In New York, selected worksite industrial hygiene surveys are conducted by the SHD, which refers employers to the State Department of Labor for technical assistance. Less frequently, OSHA (either the consultation program or compliance section) may be contacted. In Texas, the SHD refers employers to either the state OSHA consultation program or to an industrial hygienist employed by the SHD.

Editorial Note: Lead poisoning, first described by Hippocrates around 370 B.C., is the oldest recognized occupational disease. The clinical and pathophysiologic effects of higher levels of lead exposure are well known, but evidence continues to emerge concerning adverse health effects as lower BLLs. In the occupational setting, inhalation of lead dust and fume is the primary route of absorption. Data from the National Occupational Exposure Survey conducted from 1981-1983 by the National Institute for Occupational Safety and Health (NIOSH), CDC, indicate that approximately 827,000 U.S. workers are potentially exposed to lead on the job (CDC, unpublished data, 1989). Workplace exposure has also been described as a vector for childhood and community lead exposure through contamination of work clothing and the local environment.

In 1979, OSHA promulgated a Standard for Occupational Exposure to Lead, which requires that, in workplaces where lead is used, employers must monitor for airborne contamination. When airborne lead concentrations exceed 30 µg/m^3 of air (averaged over an 8-hour workshift), employers must provide an industrial hygiene program and medical surveillance (including the monitoring of BLLs). The OSHA permissible exposure limit (PEL) for lead is 50 µg/m^3 for an 8-hour workshift. An employee with one BLL ≥60 µg/dL or three BLLs that average ≥50 µg/dL over a 6-month period must be moved to a job without lead exposure until the worker's BLL declines to an acceptable level (i.e. 40 µg/dL). Although the OSHA Lead Standard has been in effect for >10 years, the data in this report indicate that overexposures to lead continue in many industries.

Construction-related industries (SICs 16 and 17) accounted for the highest proportion (30.4%) of workers with BLLs ≥70 µg/dL. The OSHA Lead Standard does not apply to the construction industry, for which OSHA has established a separate PEL of 200 µg/m^3 and does not require medical monitoring. Although the construction industry has a higher PEL for lead, this level is frequently exceeded when cutting or welding torches are used on

*An average BLL of 50 µg/dL based on three blood samples over a 6-month period or one sample >60 µg/dL requires medical removal of employee from lead exposure without loss of wages, benefits or seniority (Occupational Safety and Health Administration [OSHA] Lead Standard).

bridges coated with lead-containing paints. Lead overexposures in the construction industry should be given greater attention.

In California and Texas, the rates of elevated BLLs for Hispanics were higher than this group's relative proportion of population in those states. (Occupational disease and injury rates are higher for minority workers than for other groups, possibly because they may be employed disproportionately in shops with suboptimal controls and greater exposures.) Because the potential impact of occupational lead exposure as a minority health concern has not been previously addressed, in California, Spanish-language educational materials describing the hazards and control of lead in the workplace have been developed for minority workers.

Since 1987, the Wisconsin, Maryland and Colorado SHDs have implemented similar BLL surveillance systems, and other states are considering such systems. NIOSH, in collaboration with SHDs through the Sentinel Event Notification System for Occupational Risks program, is supporting this program development effort. A key consideration for surveillance of this problem is selection of the BLL necessary for triggering a report to the SHD. Most of the states conducting surveillance of lead toxicity in adults have adopted the level recommended by CDC for nonoccupational settings (25 µg/dL) as an indicator for elevated BLLs in children.

To eliminate occupational lead poisoning, blood-lead surveillance programs, such as those described here, are crucial for identifying individual workers and workplaces with overexposure to lead. These programs enable targeting of public health, technical, and educational resources to those worksites in need of assistance.

MMWR 09/22/89

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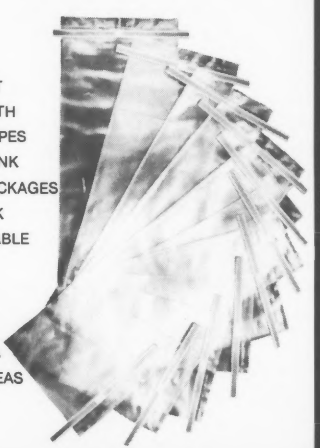

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Say Cheese Please! - Jacketed Ball Valves

Lee Fluid Transfer, Division of Lee Industries, Inc., offers the only complete line of USDA approved, fully-jacketed ball valves. This unique design is targeted for product processing in the food, cosmetic, and pharmaceutical industries. Completely jacketed, these ball valves assure hot or cold flow through the valve--whichever your application may need.

The standard, fully-encapsulating seals of the jacketed ball valve also provide maximum reduction in product entrapment. At the same time, the full-port design, which is also standard, eliminates product flow restrictions. Another standard feature on the complete line is a polished #4 I.D. (3A Standard) with a polished I.D/O.D. offered as an option. Jacketed ball valve sizes range from 1-1/2" through 4" with standard jacket pressure of 100 PSIG. Other pressures are available upon request.

Lee Fluid Transfer - Philipsburg, PA

Please circle No. 241
on your Reader Service Card

Latest on Malthus Unveiled at IFT

Radiometer America Inc., the worlds leading manufacturer of Quality Analytical and Microbiological Instrumentation, will be unveiling, at the IFT Expo, the latest advancements to our Malthus Automated Microbiological Systems. Routine tests commonly performed in the QC laboratory (TVC, coliforms, Y/M, *Salmonella*) can simultaneously be analyzed on the Malthus system quickly, accurately, and automatically. Also displaying: The Titralab[R] series of automatic, high precision potentiometric titration systems, and a full line of microprocessor-controlled pH, ion, and conductivity meters.

Radiometer America's quality, service and support-oriented commitment has made Radiometer products today's standard for automated instrumentation.

Radiometer America, Inc. - Westlake, OH

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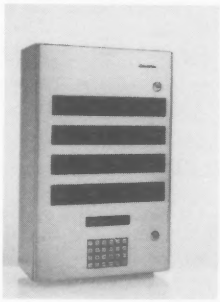


Anderson Pulse Series Monitors Simultaneously Display Liquid Level in up to 16 Tanks

Anderson Pulse 800 and Pulse 1600 Series microprocessors monitor and display liquid level in up to 8 tanks and up to 16 tanks, respectively. They are the only instruments presently available which simultaneously display liquid levels in all tanks (which can be up to 100 feet tall).

Anderson Pulse Series find use in receiving, inventory and in production tracking and control. Liquid level is displayed with +/- 0.5% accuracy over the full span regardless of the shape of the tank. Thus, the Pulse Series can be used to accurately monitor liquid level, not only in linear-shaped vessels such as perfectly-cylindrical, flat-bottom vertical tanks, but also in tanks with dished or cone bottoms, and in pitched horizontal cylindrical vessels having dished heads. The highest degree of accuracy is obtainable by "wet" calibrating vessels on site with the monitor.

Anderson Instrument Co. - Fultonville, NY

Please circle No. 243
on your Reader Service Card

QuickKit[R] Detects Toxins in Minutes!

Spectrochrom, Ltd., an Iowa State Innovation System Company has developed a procedure for detecting toxins in minutes, without the hassle and delays of sending the sample to a commercial testing lab.

QuickKit[R] provides a positive identification of the five prevalent mycotoxins, and estimates the level of contamination, in just 30 minutes. QuickKit[R] utilizes thin layer chromatography, generally recognized as the most reliable method of detecting and quantitating mycotoxins and sulfa drug residues.

QuickKits[R] are available for mycotoxins in grain, feed, milk and cheese, and sulfa residues in milk, grain, feeds, or urine.

The entire process is simple, reliable and inexpensive (about $7 per sample).

Spectrochrom, Ltd. - Ames, IA

Please circle No. 244
on your Reader Service Card

Announcing Protein Fingerprinting Software for Microbiology

AMBIS Systems announces the release of Micro PM[TM], a dedicated software package designed for microbiology research laboratories. Micro PM will allow the researcher to build a database of bacteria and then compare unknown bacteria against this database. The software can also group the bacteria in the database by cluster analysis using dendrogram and/or by 5-dimensional Principal Coordinates plots. Other innovative features of Micro PM[TM] include database creation, maintenance and search; automated lane extraction and filing; and computer controlled lane normalization, allowing direct comparison of lanes from any gel. Two research reports are available. The first deals with *Plesiomonas shigelloides* while the second examines *Aeromonas, Photobacterium*, and *Vibrio sensu strictu.*

AMBIS Systems - San Diego, CA

Please circle No. 245
on your Reader Service Card

3M Introduces new Staphylococcal Detection Test for the Food Industry

3M announces another innovation in microbiological testing for the food industry: the Report brand Staphylococcal Enterotoxin visual immunoassay, designed to detect Staphylococcal Enterotoxins A, B, C, D, and E in foods.

3M Microbiology Products simplified microbiological testing with the development of ready-to-use Petrifilm brand plates for bacterial enumeration in the dairy and food processing industries.

The Report Staphylococcal Enterotoxin immunoassay kit is fast, reliable and easy to use. It incorporates a simplified food extraction protocol to allow many samples to be assayed in a normal working day. The use of removable wells makes the Report kit flexible, allowing up to 48 tests to be performed at once.

Unlike other tests, the Report Staphylococcal Enterotoxin immunoassay requires little training and no specialized equipment. State-of-the-art ELISA (enzyme-linked immunosorbent assay) technology eliminates the need for time-consuming sample preparation and hastens test results. Accurate results are determined within four hours -- as compared to six days with previous methods.

3M Microbiology Products - St. Paul, MN

Please circle No. 246
on your Reader Service Card

Salt & Seasonings Analyzer

A new, portable, bench-top instrument, the *ASOMA* Instruments Model 8620 X-ray Fluorescence Analyzer, is offered for quick, quantitative measurement of salt & seasonings in snack foods, food preparations, and food ingredients.

Eliminating all "wet chemistry" manipulations associates with other methods, a sample is simply placed in a sample cup and measured for 60 seconds (with results automatically calculated and reported on the 8620's integral printer and LCD display). Easily operated by non-technical personnel, the instrument is designed for use on the production floor or in the QA laboratory. Solids, liquids and powders may be measured with equal ease.

ASOMA Instruments, Inc. - Austin, TX

Please circle No. 247
on your Reader Service Card

Quantab Makes Chloride Testing for Food Simple

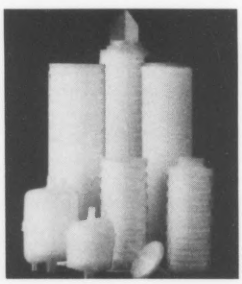
Quantab a fast, accurate, economical method of testing for chloride content of food, without the need for costly laboratory equipment or special training of personnel, is now available from Environmental Test Systems, Inc.

The test vehicle consists of a simple, yet reliable, titrator on a disposable strip, that when immersed in liquid or the dilute aqueous extraction of a solid to be tested, shows a reaction on the strip's graduated scale that can then be converted to parts per million using a chart provided. **Quantab** is useful in testing for salt content in such foods as prepared meats, cheese, butter, cured or canned seafood, vegetables, sauces or seasonings. Also dressing, pickles, chips, snacks, cereals, dry mixes, prepared animal feed or anything that contains salt to flavor, cure or preserve.

For a **FREE QUANTAB SAMPLE** and complete product information, circle the RSN below.

Environmental Test Systems, Inc. - Elkhart, IN

Please circle No. 248
on your Reader Service Card



Moyno^{R} Sanitary Pumps for Food, Chemical and Pharmaceutical Applications

The Moyno Sanitary Pump combines maximum performance, minimum maintenance cost and application versatility and provides these advantages:

Quick disassembly with few standard tools for easy cleaning; A variety of stator materials for application versatility; Design that conforms to 3A, USDA, BISSC criteria; 300 Series Stainless Steel, No. 4 finish or better, for all wettable parts; Standard flanged and gasketed clamp-style connections (ACME thread connections also available); Total on-site pump maintenance for lower maintenance cost and less down-time; Pressures to 300 psi (models available to 2100 psi); Capacities to 300 gpm.

Several types of Moyno Sanitary Pumps are available; types FFJ and FGJ, "open throat" pumps with hoppers and augers which feed high viscosity materials into the rotor-stator elements. Types FF and FG pumps can also be equipped with an optional clean-in-place (CIP) capability, permitting thorough pump cleaning without disassembly.

For a free copy of the Moyno^{R} Sanitary Pumps technical bulletin (Bulletin 125-E), circle RSN below.

Robbins & Myers, Inc. - Springfield, OH

Please circle No. 249
on your Reader Service Card

Next Generation of HDC^{R} Filters Offers Four Times Longer On-Stream Life

A technological advance in the manufacturing process of Pall HDC^{R} filters has produced a new generation of absolute rated, pleated, tapered pore polypropylene filter elements. Pall's new HDC^{R} II filters offer exceptional dirt holding capacity and up to four times longer on-stream life than conventional filters of similar appearance. The superiority of these filters is largely attributable to their unique filter medium construction, which is accomplished by varying the fiber diameter instantaneously and continuously to produce tapered pores from coarse (upstream) to fine (downstream) while maintaining constant void volume throughout the depth of the filter medium. This results in the HDC II filter medium providing higher dirt holding capacity and therefore, up to four times longer on-stream life.

Pall Ultrafine Filtration Co. - East Hills, NY

Please circle No. 250
on your Reader Service Card

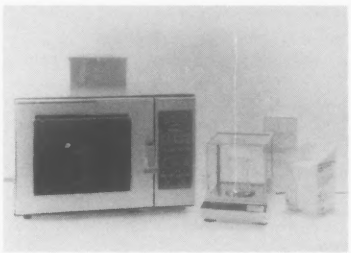
Weber Scientific's 1990 Water Analysis Catalog for Bacteriological Testing

Weber Scientific announces the publication of their 1990 Bacteriological Water Analysis Catalog. The catalog lists over 100 items chosen specifically for the bacteriological testing of water and wastewater in the laboratory and in the field.

Featured in the catalog are apparatus and supplies for Biochemical Oxygen Demand; Total and Fecal Coliform by plated, multi-tube fermentation and membrane filtration techniques. Also featured are dehydrated culture media, disposable dilution bottles, field test kits and sampling supplies.

Weber Scientific - East Windsor, NJ

Please circle No. 251
on your Reader Service Card



Model MMA-90 Microwave Moisture Analyzer

The Model MMA-90 Microwave Moisture Analyzer is a rapid, easy to use, percent moisture/percent total solids analyzer. This instrument comes with an electronic, digital computing balance. The MMA-90 is suitable for performing rapid tests on a variety of samples including liquids, pastes, slurries, and solids. Complete determination is achieved in only minutes. The MMA-90 features a stainless steel cabinet and sturdy construction suitable for continuous use.

The unit is much less expensive than competitive units currently found on the market.

Foss Food Technology Corporation - Eden Prairie, MN

Please circle No. 252
on your Reader Service Card

Braun Brush Catalogue

Don't make the mistake of assuming that this is just another brush catalogue. It is true that all other brush catalogues are pretty much just "look alikes". You won't have complete brush coverage unless you have ours too. Here are 222 items -- 57 unretouched photographs including 58 ITEMS EXCLUSIVELY MADE BY BRAUN.

Braun Brush Company is recognized around the world as the fabricator of the only truly sanitary brush. This brush has its bristles set deep into solid Epoxy. We have eliminated any concern for bristle fall out. Since there are no tuft holes, there are no crevices for foreign material to gather. No other brush has reached such a high standard of sanitation. The only brush to be approved by the U.S.D.A. All brushed using this technique are clearly marked EPOXY SET.

Braun Brush Company - Albertson, NY

Please circle No. 253
on your Reader Service Card

Dehydrated Culture Media Available from Vitek Systems

Vitek Systems has specially formulated dehydrated culture media for use with their Bactometer[R] Microbial Monitoring System. Designed for laboratory use, the media include a Modified Plate Count Agar (MPCA), a Coliform Medium (CM), a Lactic Medium (LM), and a Brain Heart Infusion Medium (BHI).

MPCA is a general purpose agar medium for the impedimetric detection of a wide range of organisms. CM is formulated for the selective impedimetric detection of coliforms. LM promotes the growth of lactic organisms for impedimetric detection. BHI is a highly nutritious general purpose medium for impedimetric detection of a broad spectrum of microorganisms.

The dehydrated media are manufactured by Difco Laboratories exclusively for Vitek Systems.

Vitek Systems - Hazelwood, MO

Please circle No. 254
on your Reader Service Card

New Food Plant Air Quality Reference Guide Available

The Engineered Air Systems Group of the King Company has just issued a new 24-page reference guide to air quality management in food plants.

Developed to aid plant designers and QA professionals, this guide covers the broad spectrum of subjects which affect product safety, production capacities and air handling system maintenance.

Specific sections on humidity and filtration cover proven methods of eliminating condensation problems and insulating the process environment from airborne contaminants such as salmonella, campylobacter and listeria.

For a free copy of this reference book circle RSN below.

King Company - Owatonna, MN

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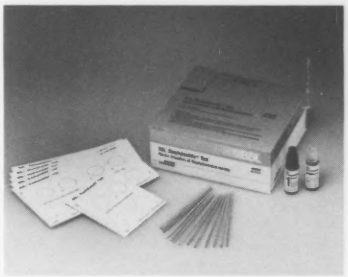
on your Reader Service Card



Complete 100-Test S. Aureus Kit Introduced; Avoids False Positives, Contains True Negative Control

Becton Dickinson Microbiology Systems, Cockeysville, MD, announces the release of **BBL[R] Staphyloslide 100[TM].**

The **BBL[R] Staphyloslide 100[TM]**, a complete 100-determination slide hemagglutination test, is designed to detect a cell-wall polypeptide clumping factor (CF) produced by *S. aureus.* Staphyloslide 100[TM] does not react to protein A, which may be found in other bacteria and may cause false positive readings in other tests.

BBL[R] Staphyloslide 100[TM] also features a true unsensitized negative control reagent. Dangers of testing for *S. aureus* without negative control when testing staphylococci by rapid agglutination have been published by D. B. Gregson, D.E. Low, M. Skulnick, and A.E Simore in their article, "Problems with Rapid Agglutination Methods for Identification of *Staphylococcus aureus* When *Staphylococcus saprophyticus* Is Being Tested" (J. Clin. Microbiol. 261398-1399, 1988).

The **BBL[R] Staphyloslide 100[TM]** Test Kit, catalog no. 40852, comes packaged with sufficient disposable slides, applicator sticks, and positive and negative reagents for 100 test determinations.

Becton Dickinson Microbiology Systems - Cockeysville, MD

Please circle No. 256
on your Reader Service Card

Clear Piping System Provides Complete Visual Control

Excelon R-4000, a clear, lightweight PVC piping system by Thermoplastic Processes, Inc., allows visual monitoring of processing applications.

The non-toxic piping is the only transparent Schedule 40 PVC pipe, ensuring control of fluid flow levels, flow rates and color changes.

Manufactured in compliance with FDA regulations, Excelon R-4000 is acceptable for use with food, pharmaceutical and chemical handling. It is non-conductive and not subject to deterioration by corrosion.

Excelon R-400 is available in ten foot lengths. Excelon sanitary fittings easily incorporate the tubing into existing systems.

Excelon R-4000 can be employed in solid, liquid, semi-pneumatic and pneumatic systems, making it ideal for food and pharmaceutical plants, laboratories, hospitals, chemical and industrial installations or wherever visual tracing is required or desirable.

Thermoplastic Processes, Inc. - Stirling, NJ

Please circle No. 257
on your Reader Service Card

New Beta-Lactam Antibiotic Test

The CITE^{R} PROBE^{TM} Beta-lactam Antibiotic Test is a highly accurate test that detects, at varying levels, members of the Beta-lactam family. This includes penicillin G, ampicillin, cloxacillin, cephapirin, and amoxicillin. Results which correlate with the *Bacillus stearothermophilus* disc assay are available in less than 15 minutes.

The PROBE Beta-lactam test has been designed for simplicity. Packaged in single-use units, PROBE tests contain pre-measured reagents and are disposable. A simple, dip-and-read protocol involves no mixing, measuring, rinsing or sample treatment. A special prefilter is built into the kit to screen out sample solids, so many kinds of milk samples can be used. No special equipment or long heating steps are required, so the PROBE Beta-lactam test can be run in the plant or the field. Results are easily read by comparing the color intensity of two blue spots - a sample spot and calibration spot - that develop on a white test surface.

IDEXX Corp. - Portland, ME

Please circle No. 258
on your Reader Service Card

New 1990 Product Catalogue Now Available

This 400-page document includes information on many new products, including compact laboratory water systems, centrifugal filter devices, blotting membranes and transfer systems, and environmental testing products.

Each section is color coded, and the Table of Contents and indexes have been expanded for faster location of products. A full-color Membrane Selection Guide has been bound into the book, which can be removed and used as a wall chart.

Copies are available free upon request.

Millipore Corporation - Bedford, MA

Please circle No. 259
on your Reader Service Card

New Line of Super Sanitary C.I.P. Ball Valves

This new line of valves designed for C.I.P. (Clean-in-place) applications and includes both flush bottom tank valves and two-way inline valves. The valves can be easily installed and incorporated into any C.I.P. system. Also if existing Fluid Transfer valves are being utilized, they can be easily replaced with the new C.I.P. valves since the mounting dimensions are identical. The valves are designed with a dedicated C.I.P. port and a unique cut-away ball which allows the cleaning solution to flow through the cavity of the ball and body, cleaning the valve thoroughly. The ball is designed to create turbulence in the valve body making it easy to remove any product.

Also gas and steam can be injected into the side port to sterilize the process piping downstream to a filler. This is excellent for aspetic systems utilizing portable tanks. This side port could also be used for product sampling.

Sizes range from 1-1/2" to 4", featuring type 316 stainless steel and Teflon seal construction. All construction materials are USDA, FDA Accepted.

Fluid Transfer, a division of Lee Industries, Inc. - Philipsburg, PA

Please circle No. 260
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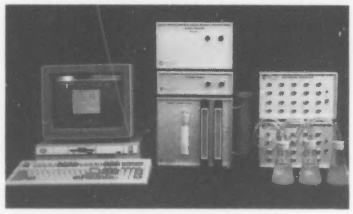

Bacteria and Fungus Detector

New 20 channel O2/CO2 Bio-Respirometer from Columbus Instruments detects bacteria or fungus growth be measuring oxygen consumption and CO2 production resulting from biological activity.

It features remarkable sensitivity of **0.2 microliter O2/hour.**

Principle is basically similar to "old" Warburg apparatus, but due to precision of O2 and CO2 sensors and computer automation measurements are much easier to perform and approximately 10 times more accurate.

For testing, sample of culture is placed in an enclosed container while oxygen depletion plus CO2 production in the container is measured with very high precision over programmed period lasting from 4 min to few hours.

Chambers can vary from 50 mL to 20 Liters. Measurements can be performed at room temperature or at any other temperature by immersing test chambers in the water bath.

Samples can be either solid or liquid.

This instrument has already proven itself in early detection of bacterial contamination of infant formula (Similac) and in testing grains for aflatoxin.

Columbus Instruments - Columbus, OH

Please circle No. 261
on your Reader Service Card

New Catalog of Safety Products Offered Free

A new catalog of products designed to meet or exceed OSHA, ANSI and USDA requirements for industry is offered free by Direct Safety Company.

Illustrated in full color, the catalog contains a complete line of practical and educational products for sanitation, health and safety. Included are protective clothing, hand, eye, ear, and face protection, respirators, environmental monitors, anti-slip products, leak detectors, products for sanitary maintenance, first aid and emergency response, signs, labels, barricades, and communication systems, safe lighting, educational charts, manuals and videos, fire protection products, and more.

For a free copy circle RSN below.

Direct Safety Company - Phoenix, AZ

Please circle No. 262
on your Reader Service Card

Forum For Professional Sanitarians

The Uniform National Plan for Training of Foodservice Managers, published by the Food and Drug Administration in 1977, was a landmark in food safety education. FDA's model program provided local and state health agencies a recommended course curriculum and outlined program administration requirements to establish nation wide uniform manager training and certification.

As a result of FDA's efforts, new training and certification programs were implemented by some state and local health departments. The food industry also used the national model to develop and provide sanitation training to their members.

In the mid 80's it was recognized that the FDA model plan was in need of major revision as it no longer met the needs for establishing uniform manager training programs. The need to revise the FDA model program was due in part to the rapid growth of the food service industry and the introduction of new food processing technologies in retail facilities. At least four issue papers submitted to the 1990 Conference for Food Protection recommended that a new model be developed.

A Conference Ad Hoc Committee was established to revise the old model and to identify an agency or organization to develop a new uniform curriculum. During the Atlanta Conference I listened to a number of discussions on how to revise the current model. Recommendations ranged from make it longer, make it mandatory, and require national testing and reciprocity to make it shorter, let state and local officials determine content and don't worry about reciprocity.

Whatever direction is taken the members of the Ad Hoc Committee will have a difficult job. No matter how much education and testing theory is used in developing a new model if it can't be sold to state lawmakers, it won't be widely implemented.

OFF THE CLIPBOARD:

- Looks like a name change for IAMFES is being discussed (see Thoughts From the President in the March issue). Just a couple of thoughts on this issue. IAMFES is in a better position than any other professional group at this time to appeal to all individuals working in the environmental sciences. If the real interest is expanding membership then the executive board should discuss a membership drive.

- A number of new developments in food safety education ranging from consumer education to manager training have been announced in recent months.

-USDA has developed a HACCP based consumer education program called "A Margin of Safety: The HACCP Approach to Food Safety Education". For more information on this program contact: USDA HACCP Project Coordinator, 1160 South Building, 14th and Independence Avenues SW, Washington, DC 20250.

- USDA is also developing another consumer food safety education effort that will use the vast resources of the cooperative extension system. This program, known as the National Initiatives for Improving Nutrition, Diet and Health, will involve county extension agents in local food safety education activities. Contact your local extension agent to find out more about this one.

- The Food Marketing Institute has provided its members with a computer based training program that helps to prepare managers to pass the National Testing Service examination. We will provide more details on this innovation after we have a chance to use it. The National Restaurant Association has announced the "Serve-Safe" program that will provide managers an opportunity to receive a two-year degree in food service management. You will be hearing a lot more about this one.

- Twenty years ago: Paul Welch described the Registered Sanitarian as an "important person on the public health team of the future." Paul challenged the profession to "never forget our obligation for the advancement and protection of Public Health." Charles Johnson, Jr. announced a reorganization of the Food and Drug Administration that would result in a new approach to consumer protection and environmental health.

- OOPS a typo in the field inspection quiz for February left out a minus (-). Answer B to question #3 should have read: "freeze at -10 F or below and hold for 7 days."

- If we need more members why not start a membership drive? I challenge all the readers of the column to sign up one new member before the August Conference. The individual signing up the most new members before the August Conference will receive a free "Clean Up America" T-shirt. See you at the IAMFES conference in Illinois.

Homer C. Emery, RS
Chair, FDA Interpretations Committee

July Field Inspection Quiz

1. The number of new Dairy products introduce to consumers during 1989 was second only to snack foods and candy. The approximate number of new Dairy products introduced during 1989 ranged from:
   A. 500 to 750
   B. 1,000 to 1,100
   C. 350 to 450
   D. 1,200 to 1,300

2. A restaurant owner using a water well wants to install a reverse osmosis (RO) system to reduce dissolved solids (currently averaging 1,880 ppm). All other things (pH, hardness) being equal which type of RO membrane should be used in this system?
   A. Celluose Acetate (CA)
   B. Thin Film Composite (TFC)
   C. Poly Acetate (PA)
   D. Mono Acetate (MA)

3. The Norwalk Virus has been implicated as the cause of several nonbacterial foodborne illness outbreaks. The source of this virus is:
   A. Humans
   B. Swine
   C. Poultry
   D. All the above

4. Once an infected person has recovered from the Norwalk Virus can be passed to other persons for another:
   A. 2 to 3 days
   B. 30 to 45 days
   C. 10 to 15 days
   D. 'cannot be passed on after recovery

5. The best means of preventing the spread of the Norwalk Virus would be to:
   A. maintain a 2.0 ppm chlorine level in drinking water
   B. follow strict handwashing procedures
   C. use cooking temperature of at least 145 F
   D. store foods below 40 F to prevent multiplication

Answers to May FIQ: 1. (B); 2. (D); 3. (B); 4. (C); 5. (A). Don't forget to send your items in for the Great IAMFES Summer Fun FIQ Contest. Submit the best item and receive a "Clean Up America" T-shirt.

Affiliate News

KAMFES officers from left to right: Judy True, Treasurer; Holly Wade, President-Elect; David Klee, President; Rick Molohon, Vice President; and Debbie Pierce, Secretary.

From left to right: back row, Mike Sheehan, Larry Bushong, Meredith Scales, Jay Fillman, Joey Purdom, Theo Terry, George Jones and Ed Palko. Front row, Brenda Ward, Nancy Cooper, Judy Smith, John Sidebothan, Danny Jasper and Paul Stephenson.

KAMFES Annual Meeting Report

The 1990 Annual Kentucky Association of Milk, Food and Environmental Sanitarians met in Louisville February 26-28. The theme of the program was "Networking to meet the challenges of the 90's." Dr. Trenton G. Davis, Dean of the School of Industry and Technology at East Carolina University was the keynote speaker. Dr. Davis also presented slides of his trip to Chernobyl, U.S.S.R. Dr. Oris Blackwell discussed the risks of incinerating nerve gas at the Lexington Army Depot.

The new Board of Directors and officers were inducted. Four resolutions were supported concerning fluoridated water, motor carries hauling food and hazardous waste int he same trailer, mandatory statewide garbage collection and the expansion of environmental epidemiology and risk assessment.

Virginia Association of Sanitarians and Dairy Fieldmen

Fifty people attended the Virginia Association of Sanitarians and Dairy Fieldmen's Dairy Industry Workshop held March 6-7, 1990 in Blacksburg, VA.

Talks included a Milking Machine Update, with discussions by field representatives, inspectors and company representatives; Robotic Milking by Will Godwin, IBA, Inc, MD; Dairy Lipids, by Dr. Sue Duncan, Virginia Tech; and IMS Update, by J.R. Bishop, Virginia Tech. A panel discussion on Water and Waste Management was also held.

President Jim Stump conducted the first day's meeting, and Barbara Pennington and Haney Hodges presided over the second day's meeting, which included the business meeting.

Meeting attendees discussed the Virginia Agri-business council, the farm bill, and progress and prospects for the GATT negotiations on agriculture. The speaker, Dr. Rao Jude, ESS Lab, College Park, MD, talked about the dairy industry in India.

The following slate of officers was appointed for next year's meeting:

President ..... Barbara Pennington
First Vice President ..... Rodney Phillips
Second Vice President ..... Tom Owens
Secretary/Treasurer ..... Haney Hodges

Upcoming IAMFES Affiliate Meetings

SEPTEMBER

•**13-14, Minnesota Sanitarians Association, Inc.** Annual Conference will start at 1:00 p.m. on September 13 at the Earle Brown Center, University of Minnesota. Annual meeting will start at 4:30 p.m. on September 13 with the Awards Banquest at 6:00 p.m. at the Holiday Inn, Shoreview. For further information call Roy E. Ginn at (612)785-0484.

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

•**19-20, Wisconsin Association of Milk and Food Sanitarians Annual Meeting**, Pioneer Inn, Oshkosh, WI. For more information contact Neil Vassau (608)267-3504.

•**25-26, California Association of Dairy and Milk Sanitarians Annual Meeting**, Ontario Hilton, Ontario, CA. For more information contact Jack Coppes, P.O. Box 9234, Whittier, CA 90608, (213)699-4313

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

NOVEMBER

•**28, Ontario Food Protection Association Annual Meeting**, will be held at the Airport Hilton Hotel, Toronto, Ontario. The title of the all-day symposium is "FOOD PROTECTION: HOT TOPICS FOR THE '90's". For more information, please contact program convenors: Garth Sundeen (416)239-8411 or FAX (416)239-2416 or Patrick Kwan (416)671-5080 or FAX (416)671-5176.

There will be a meeting of the executive committee in May to make committee appointments for next year's meeting. In June there will be a program committee meeting. Haney Hodges would like to incorporate neighboring states' members into the meeting next year.

Missouri Milk, Food & Environmental Health Association

The 58 year-old Missouri Milk, Food and Environmental Health Association recently presented awards at its 1990 Conference held April 4-6, 1990 in Osage Beach, Missouri.

Winners include: Dr. Dennis Sievers, Dr. Randall Miles, and Ron Blumer of *Columbia*; Sam Orr of *Jefferson City*; and Nicole C. Williams of *Kansas City*.

The prestigious Monarch Sanitarian Citation Award was presented to Ron Blumer of *Columbia* Health Department by David Rector representing Monarch Division of H.B. Fuller. Blumer is Chief of the Bureau of Environmental Health at the Columbia/Boone County Health Department. The award recognized excellence, outstanding

Left to right: Ron Blumer, Chief, Bureau of Environmental Health, Columbia/Boone County Health Department, Columbia, Missouri, Monarch Award recipient; and David Rector, H. B. Fuller-Monarch Division presenting the award.

service and significant contributions in the field of sanitation. Blumer has worked for the Health Department for twenty-two years and supervises field personnel in investigations of all areas of environmental sanitation and animal control.

Awards of Special Recognition were presented to Dr. Dennis Sievers and Dr. Randall Miles of *Columbia*, and Sam Orr of *Jefferson City*. These awards were given in recognition of their efforts to establish reliable criteria for determining the suitability and design standards for on-site sewage disposal systems. These criteria were based on soil classifications of the site. They also developed an educational format for and assisted in statewide training of environmental professionals.

Sievers is a Professor of Agricultural Engineering and Miles is an Assistant Professor of Soil Science, both with

Left to right: Dr. Dennis Sievers, professor Agricultural Engineering, College of Agriculture, MU-Columbia; Dr. Randall Miles, associate professor of Soil Science, Department of Agronomy, College of Agriculture, MU-Columbia; Sam Orr, Soil Survey Manager, Missouri Department of Natural Resources; and Gregg Fast, past president, MMFEHA.

the University of Missouri-*Columbia*. Orr is a Soil Survey Officer for the Missouri Department of Natural Resources.

Nicole C. Williams of *Kansas City* received the J.E. Edmondson Scholarship Award in the amount of $500.00. Williams is studying Food Science and Nutrition at the University of Missouri-*Columbia*, and will apply the scholarship toward her studies leading to a career in food technology. Williams, daughter of Charlotte Williams and Fredrick Smith of *Kansas City*, has previously been awarded a Curator Scholarship and a Brooks Scholarship. Williams is a graduate of Paseo High School. The annual scholarship is named for Joseph E. Edmondson, MU professor emeritus who currently resides in *Columbia*.

Affiliate Council Office Winners

Ronald H. Schmidt, Ph.D. has been elected the new Affiliate Council Chairman. Dr. Schmidt is a Professor in the Food Science & Human Nutrition Department at the University of Florida, Gainesville, FL.

Ruth Fuqua has been elected Affiliate Council Secretary. Ms. Fuqua is currently the Director of Quality Assurance for Flav-O-Rich, Inc., Louisville, KY.

They will assume their new positions at the IAMFES Annual Meeting in August.

Committee Meetings - Sunday, August 5

Schedule & Agendas

These are tentative agendas of the Committee Meetings as of May 1, 1990

COMMITTEE MEETING SCHEDULE

9:00 - 1:00	NMPF/IMS
9:30 - 10:30	Dairy Quality & Safety - Farm Section
10:00 - 11:00	Baking Industry Sanitary Standards
10:00 - 11:00	DFES Management
10:00 - 12:00	Constitution & By-Laws Review
10:00 - 5:00	Communicable Diseases Affecting Man
10:30 - 11:30	Dairy Quality & Safety - Plant Section
11:00 - 12:00	JFP Management
11:00 - 12:00	Food Service Sanitation
11:00 - 12:00	Nominating
1:00 - 3:00	IAMFES Name Change
1:30 - 2:30	Sanitary Procedures
1:30 - 2:30	Food Equipment Sanitary Standards
1:30 - 2:30	Audio Visual Libray
1:30 - 3:30	Applied Laboratory Methods
2:00 - 4:00	Affiliate Council
2:30 - 3:30	Retail Foods
2:30 - 3:30	Water Quality & Wastewater
3:00 - 4:00	Foundation Fund
3:30 - 5:00	FDA Food Service Interpretation

Dairy Quality and Safety - Farm Section
Chicago Room
9:30 - 10:30

- Implementation of Pictograms as Uniform Symbols to Identify Farm Chemicals
- Pipeline Applications
- Color Coding Animal Drug Labeling
- Update on Animal Drug Residues
- Current Issues

Baking Industry Sanitary Standards
Conference Room #15
10:00 - 11:00

- In depth discussion of the BISSC Certification Program
- Discuss contacting academia and requesting their participation in the formation of an agenda to create an interest in field sanitarians, in the bakery field, to assume an active role in the BISSC Certification Program
- Contact and request that Regulatory Agencies conducting sanitation surveys, in baking facilities, incorporate in their procedures of inspection the use of BISSC Standards as a guideline.
- Enlist the input of field sanitarians currently engaged in the review and evaluation of baking equipment and, if possible, their active participation in the formulation of new BISSC Standards and the upgrading of the present BISSC Standards.
- Contact Public Health Regulatory Agencies and request that Field Sanitarians evaluate baking equipment during the course of routine sanitation surveys and alert the BISSC Committee of all violations of BISSC Standards on equipment displaying the BISSC Seal of Acceptance.

Dairy, Food and Environmental Sanitation Management
Conference Room #10
10:00 - 11:00

- Discussion on Format and Contents of Journal
- Editors Report on Volume 10
- Discussion on the Article Contest that was to be funded by the Foundation Fund

Dairy Quality and Safety - Plant Section
Chicago Room
10:30 - 11:30

- Progress since the "Dairy Product Safety Initiatives"
- Milk Plant - New Employee Training Materials
- Current Issues

Journal of Food Protection Management
Conference Room #10
11:00 - 12:00

- Discussion on the Status of the 1989 Volume of JFP. The flow of manuscripts and the time it takes from acceptance date to publication.
- Editorial Office Report
- Possibility of Submitting Manuscripts via Disk

Food Service Sanitation
Conference Room #6
11:00 - 12:00

OLD BUSINESS
1. Temporary Food Service Sub-Committee Update
   A. Pamphlets' Revision and Publication Review (Operator's)
   B. Regulatory Overview and Proposal of Model Code
   C. Solution's, Recommendations and Additional Information
2. Sanitary Disposal of Single Service and Solid Waste; and the Sanitation of Packaged Ice
   A. Overview of Model Code (AFDO) on Ice Sanitation
   B. Additional information on Disposal of Single Service and Solid Waste Issues

NEW BUSINESS
1. Time-Temperature Concerns thorough Distribution
   A. Overview of Concerns
   B. Status of Monitoring Standards/Equipment
   C. Regulatory Overview and Industry Needs
2. Microwave Oven's and Related Food Safety Issues
   A. Overview of Concerns
   B. Status of Monitoring Standards/Equipment
   C. Regulatory Overview and Industry Needs
3. Recommendations to the "Conference for Food Protection"

IAMFES Name Change
Conference Room #1
1:00 - 3:00

1. Review why a Name Change is being considered
2. Discuss approaches to take in determining membership's interest in a name change
3. Establish protocol for determining new name
4. Establish protocol for changing organization's name
5. Comments from members

Food Equipment Sanitary Standards
Conference Room #15
1:30 - 2:30

1. Introductions
2. NSF Food Equipment Standards Review 1989-90 - Standards development
3. 1990 Annual Meeting - NSF Joint Committee on Food Equipment
   A. Discussion items
   B. Actions taken
4. Automatic Merchandising Health - Industry Council (AMHIC) - Vending machine construction standards update
5. Issues for Discussion - Unauthorized industry use of "regulatory agency approval" for equipment sales and advertising

Audio Visual Library
Conference Room #10
1:30 - 2:30

1. There is a need to streamline the process for getting new material into the Lending Library
2. Discussion of how to keep pace with the need and demand of the Library
3. Establish new areas and identify new topics for material for the Lending Library. Also, where available
   - A summary of the evaluations returned with the Library materials for the past year will be handed out, with suggestions
4. What is the future support for the Library from the Foundation?

Applied Laboratory Methods
Chicago Room
1:30 - 3:30

1. Welcome and Introduction
2. Goals/Committee Function
3. Highlights of 1989 Minutes
4. Completed Projects/Accomplishments
5. Current Project/Research Reports and Discussion
   A. Coliform MPN method with LST and BGLB broth
   B. Elimination of mouth pipetting
   C. The comparison of the optical somatic cell method and the DMSCC (Pyronin-y-Methyl Green Stain) for raw goat milk samples
   D. Coliform limit in dairy products
   E. Efficacy assessment of refrigerating inoculated plates or biochemicals prior to incubation
   F. IAMFES/AOAC liaison
6. Identification of Problems
   A. Testing of antibiotic and drug residues in milk
   B. Rapid and confirmatory inhibitor testing methods
   C. Others
7. Assignment of Problems
8. Networking Projects
9. Other Business
10. Summary/Report for Executive Board
11. Adjournment

Affiliate Council
Illinois Room
2:00 - 4:00

1. Role Call of Affiliate delegates
2. Introduction of Executive Board
   - Comments of Executive Board and Executive Staff
3. Old Business
   - Election of new Affiliate Council Chairperson and new Affiliate Secretary
4. New Business
   - Discuss new affiliates
5. Affiliate Reports

Foundation Fund
Conference Room #15
3:00 - 4:00

1. Audio Visual Lending Library
2. Discuss incentive on Articles for DFES, general recipient receives $250.00
3. Any educational programs that could be funded by the Foundation Fund

Authors Wanted

Dairy, Food and Environmental Sanitation is looking for individuals interested in writing articles for our journal. If you are interested, please contact IAMFES for more information.

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❑ *Dairy, Food and Environmental Sanitation*

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"Taste of Chicago" (Mon., 8/6)

Art Institute, Lunch, Sears Tower (Mon., 8/6)
Long Grove Shopping, Lunch (Mon., 8/6)
Water Tower Place, Lunch, Shopping (Tues., 8/7)
Haeger Pottery Tour, Lunch, Shopping (Tues., 8/7)
Morton Arboretum, Lunch, Shopping (Wed., 8/8)
Kraft Cooking Demo (Hotel) (Wed., 8/8)
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An exhibition of products and consultant services will be at the Woodfield Hilton and Towers. For more information on exhibiting at the conference, please contact Scott Wells at 1-800-369-6337.

IAMFES

77th Annual Meeting
Special Events Program

LONG GROVE VILLAGE/HOBSON HOUSE RESTAURANT

Monday, August 6, 1990
9:30 a.m. - 3:30 p.m.
Cost: $20.00 (Includes Lunch)

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

ART INSTITUTE TOUR

Monday, August 6, 1990
9:00 a.m. - 4:00 p.m.
Cost: $25.00 (Includes Lunch)

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

HAEGER POTTERY/MILK PAIL VILLAGE

Tuesday, August 7, 1990
9:00 a.m. - 3:30 p.m.
Cost: $20.00 (Includes Lunch)

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

"MAGNIFICENT MILE" — WATER TOWER PLACE TOUR

Tuesday, August 7, 1990
9:00 a.m. - 4:00 p.m.
Cost: $25.00 (Includes Lunch)

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

MORTON ARBORETUM TOUR

Wednesday, August 8, 1990
9:00 a.m. - 4:00 p.m.
Cost: $20.00 (Includes Lunch)

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

KRAFT COOKING DEMONSTRATION (WOODFIELD HILTON AND TOWERS HOTEL)

Wednesday, August 8, 1990
Cost: FREE

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

Synopsis of Papers for the 77th Annual Meeting

Abstracts of papers to be presented at the 77th Annual Meeting of the International Association of Milk, Food and Environmental Sanitarians, Inc. to be held in Arlington Heights, IL, August 508, 1990.

Analysis of Biofilm Formation: Confocal Laser Microscopy and Computer Image Analysis, *Douglas E. Caldwell*, Department of Applied Microbiology & Food Science, University of Saskatchewan, Saskatoon, Saskatchewan S7N 0W0, Canada

Computer assisted light microscopy and confocal laser microscopy were used to study the colonization of glass and other surfaces in continuous-flow slide culture. Analog video recordings and on-line video signals were digitized in real time and analyzed using a Kontron, IBAS 2000 image processor. A Biorad MRC-500 confocal laser system with argon laser (488 and 514 nm emission peaks) was used for laser microscopy. Fluorescein was used as a negative fluorescent stain to image non-fluorescent cells. Several other fluorescent probes including resazurin, carboxyfluorescein, and FITC conjugated dextrans, were used to image the physicochemical characteristics of cells, cell aggregates, and biofilms. These techniques provided detailed quantitative information concerning the growth kinetics and behavioral adaptations of a bacteria colonizing surface microenvironments. This included growth rates, attachment rates, detachment rates, directions and rates of motility, analysis of cell distribution and orientation, distribution of exopolymers, cell viability, cell metabolism, predation rates, biofilm architecture, and response to salinity, light, antibiotics, hypochlorite, as well as other antimicrobial agents and environmental stresses. Pseudocolor maps of pH, Eh, and molecular sieving were also produced for surface microcolonies and for microbial biofilms. From these analyses it is apparent that the behavioral response of a bacterium to a surface is specific and highly dependent upon grazing pressures as well as ambient environmental conditions. This behavioral specificity is possible through genetically controlled adaptive strategies involving the type, timing, and rate of exopolymer production, morphogenesis, attachment, detachment, flagellation, and growth.

Tracking *Listeria* in the Environment, *Peter J. Slade*, University of Guelph, Guelph, Ontario, Canada

Many questions still remain regarding the transmission of listeriosis by food. Tracking *Listeria* spp. in the environment from primary producer, to processor through to potential victim draws on key elements of isolation, identification and typing. Methodology for optimal recovery of listeriae from food is still in a state of flux. Recovery of potentially injured *Listeria*, and the seemingly infrequent isolation of hemolytic species other than *L. monocytogenes* namely *L. ivanovii* and *L. seeligeri*, are areas for investigation. Alternatives to traditional biotyping regimes for identification of pathogenic *Listeria* spp. have focused on development of DNA probes for detection of hemolysin determinants. Classical typing schemes (e.g. serotyping and phage typing) have been augmented by multilocus enzyme electrophoresis (MEE), and plasmid profiling and fingerprinting. The potential for chromosomal DNA fingerprinting and restriction fragment length polymorphism (RFLP) analysis, and the novel technique of low molecular weight (LMW) RNA profiling have not been addressed.

Benefits of improved tracking systems and alternative typing schemes for *Listeria* spp. include: (a) advances in taxonomy, which may identify reservoirs of strains potentially pathogenic to man, (b) design of comprehensive HACCP programs, and (c) facilitated epidemiological investigations.

The Study of Bacteriocins Obtained from Bacterial Species Utilized in Food Fermentations and their Potential Use for Improved Food Safety, *Gary W. Stoddard*, Department of Food Science & Nutrition, University of Minnesota, St. Paul, MN

Researchers throughout the world are searching for and investigating the presence of bacteriocins (antagonistic proteins) in a wide variety of industrially important bacterial genera. Lactic acid bacteria used in a variety of food fermentations have attracted a great deal of attention and numerous bacteriocins produced by them have been extensively studied. These "food grade" bacteriocins have shown great diversity in their inhibitory effects towards both closely related and unrelated bacterial species. Several of these bacteriocins have demonstrated potent inhibitory effects in host range studies. The study and legalization of bacteriocins in food systems has centered on the bacteriocin, nisin. There appears to be limitless potential for using a variety of specific bacteriocins in extending shelf life, reducing spoilage and increasing food safety. This potential is enhanced by available methods in genetic and protein engineering for increasing or decreasing host range and specificity.

Microbial Ecology of Listeriae-Containing Biofilms, *Joseph F. Frank*, Department of Food Science & Technology, University of Georgia, Athens, GA 30602

Listeria spp. grow in the food processing environment within multispecies biofilms. Microbial interactions may occur within these biofilms resulting in consistent relationships between groups of microorganisms. Competition for attachment sites and nutrients, oxygen limitations, and production of growth stimulants and inhibitors act to provide predictable microbial relationships within biofilms. Survey data has identified associations between listeriae and microbial groups such as staphylococci, aerobes, salt tolerant aerobes and fungi in dairy processing environments. Survey results indicate that staphylococci and salt tolerant aerobes have a high degree of association with listeriae. A predictive model was developed which allows a risk assessment for listeriae contamination of a surface based on the number of staphylococci. Research on the ecology of listeriae-containing biofilms could provide a foundation for developing efficient sanitation practices within the food industry.

Letter to the Editor

Dear Dr. Doyle:

The two pages of material in the March 1990 *Sanitation* by IAMFES President Ron Case and the earlier president's perspective by Robert T. Marshall prompted this letter.

In thinking about the organization and the journals, my thinking went something like this. First of all, we are an association of individuals, and perhaps also companies but primarily individuals. We are all persons dedicated to looking for a safe food supply. Having said this, I was immediately confronted with the idea that we have a *Journal of Food Protection*, when really the positive side of that might be the journal for a safe food supply. I think at that point I came back to the present name, *International Association of Milk, Food and Environmental Sanitarians*, which, in reality is a very descriptive name of the people in the organization except, as was pointed out, milk is a food. The second point is that the word, "sanitarian," which I did not look up in the dictionary, but, in our context I think would mean a person interested in working toward a safe food supply.

Having made a comment above that we are interested in a safe food supply, I think I would still vote to keep the name of the journal, "Journal of Food Protection," rather than a name such as the "Journal for a Safe Food Supply," mainly because the term, "Journal of Food Protection," is a nice concise term that sounds good and does have meaning.

In my opinion, the cover of the March 1990 issue of *Sanitation* is a very good one, and while it says "Dairy, Food and Environmental Sanitation," the catchy word is "sanitation," and I think that probably that journal should evolve to where it is basically called *Sanitation*.

For your consideration, I suggest that you consider changing the name of the organization to "International Association of Milk, Food and Environmental Scientist." When that thought first crossed my mind, I rejected it. However, upon further thought and reflecting on the way that name and title escalation has taken place in the last two decades, when the head of the cleanup crew is the sanitary foreman or maybe even the sanitation engineer, perhaps we would not be stretching the use of the term in our title. Simply instead of using the term, "sanitarian," which probably should have been the proper term for the 1940's and 1950's, use the term, "scientist" in the 1990's. I vote for "International Association of Milk, Food and Environmental Scientist."

Thanks for reading my comments.

Sincerely yours,
I. J. Pflug
Professor of Food Science and Nutrition

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Hamilton

Nigeria

B J O Efiuvwervwere
University of Port Harcout
Port Harcourt

Spain

Benito Orihuel Iranzo
Gandia, Valencia

Zimbabwe

Lilian Marovatsa
University of Zimbabwe
Harare

PART ONE OF THE 3-A SANITARY STANDARDS FOR INSTRUMENT FITTINGS AND CONNECTIONS USED ON MILK AND MILK PRODUCTS EQUIPMENT

Number 09-08

Formulated by

Interntional Association of Milk, Food and Environmental Sanitarians

United States Public Health Service

The Dairy Industry Committee

It is the purpose of the IAMFES, USPHS, and DIC in connection with the development of the 3-A Sanitary Standards program to allow and encourage full freedom for inventive genius or new developments. Instrument fittings and connections specifications heretofore or hereafter developed which so differ in design, material, construction, or otherwise, as not to conform with the following standards, but which in the manufacturer's or fabricator's opinion are equivalent or better, may be submitted for the joint consideration of the IAMFES, USPHS, and DIC at any time.

These 3-A Sanitary Standards are in two parts. This Part One contains the text. Part Two contains the drawings.

A

SCOPE

A.1

These standards cover the sanitary aspects of instrument fittings and connections for milk, milk product and frozen dessert mix equipment and on lines which hold or convey milk, milk products and frozen dessert mix.

A.2

In order to conform with these 3-A Sanitary Standards, instrument fittings and connections shall comply with the following design, material and fabrication criteria.

B

DEFINITIONS

B.1

Product: Shall mean the milk, milk products and frozen dessert mix.

B.2

Surfaces

B.2.1

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

B.2.2

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

B.3

Instrument Fittings and Connections (Referred to as fittings throughout this standard): Shall mean fittings and/or connections for instruments or their sensing elements that will be installed in milk, milk products and frozen dessert mix equipment and in sanitary pipelines, for the measurement of temperature, pressure or other process variables.

B.4

Permanently Installed Fittings: Shall mean fittings that are permanently installed in the equipment by welding or a method provided for in the 3-A Sanitary Standards for that piece of equipment.

B.5

Mechanical Cleaning or Mechanically Cleaned: Shall denote cleaning, solely by circulation and/or flowing chemical detergent solutions and water rinses onto and over the surfaces to be cleaned, by mechanical means.

C

MATERIALS

C.1

All product contact surfaces shall be of stainless steel of the AISI 300

series*1 or corresponding ACI*2 types (See Appendix, Section F.), or metal which under conditions of intended use is at least as corrosion resistant as stainless steel of the foregoing types and is non-toxic and non-absorbent except that:

C.1.1
Rubber and rubber-like materials may be used for probe insulators, probe holders, gaskets, diaphragms, bonded coatings and coverings, and parts having the same functional purposes.

C.1.2
Rubber and rubber-like materials when used for the above specified applications shall comply with the applicable provisions of the 3-A Sanitary Standards for Multiple-Use Rubber and Rubber-Like Materials, Number 18-00.

C.1.3
Plastic materials may be used for probes, probe insulators, probe holders, gaskets, diaphragms, bonded coatings and coverings, and parts having the same functional purposes.

C.1.4
Plastic materials when used for the above specified applications shall comply with the applicable provisions of the 3-A Sanitary Standards for Multiple-Use Plastic Materials, Number 20-15.

C.1.5
Rubber and rubber-like materials and plastic materials having product contact surfaces shall be of such composition as to retain their surface and conformational characteristics when exposed to the conditions encountered in the environment of intended use and in cleaning and bactericidal treatment or sterilization.

C.1.6
The final bond and residual adhesive, if used, of bonded rubber and rubber-like materials and bonded plastic materials shall be non-toxic.

C.2
Materials having a product contact surface(s) used in the construction of instrument fittings and connections designed to be used in a processing system to be sterilized by heat and operated at a temperature of 250 degrees F (121 degrees C) or higher shall be such that they can be (1) sterilized by saturated steam or water under pressure (15.3 psig or 107 kPa) at a temperature of at least 250 degrees F (121 degrees C) and (2) operated at the temperature required for processing.

C.3
Non-product contact surfaces shall be of corrosion-resistant material or material that is rendered corrosion-resistant. If coated, the coating used shall adhere. Non-product contact surfaces shall be relatively non-absorbent, durable and cleanable. Parts removable for cleaning having both product and non-product contact surfaces shall not be painted.

D
FABRICATION

D.1
All product surfaces shall have a finish at least as smooth as a No. 4 ground finish on stainless steel sheets and be free of imperfections such as pits, folds and crevices in the final fabricated form. (See Appendix, Section G.)

D.2
Permanent joints in metallic product contact surfaces shall be continuously welded. Welded areas on product contact surfaces shall be at least as smooth as a No. 4 ground finish on stainless steel sheets, and be free of imperfections such as pits, folds and crevices in the final fabricated form.

**1 The data for this series are contained in the AISI Steel Products Manual, Stainless & Heat Resisting Steels, December 1974, Table 2-1, pp. 18-20. Available from the Iron and Steel Society, 410 Commonwealth Drive, Warrendale, PA 15086 (412-776-9460).*

**2 Alloy Casting Institute Division, Steel Founders Society of America, Cast Metal Fabrication Bldg., 455 State St., Des Plaines, IL 60016 (312-299-9160).*

D.3
Product contact surfaces not designed to be mechanically cleaned shall be easily accessible for cleaning and inspection either when in an assembled position or when removed. Removable parts shall be readily demountable.

D.4
Fittings that are mechanically cleaned shall be designed so that the product contact surfaces of the sensing device can be mechanically cleaned, and all non-removable appurtenances thereto can be mechanically cleaned and are accessible for inspection.

D.5
Gaskets having a product contact surface shall be removable or bonded.

D.6
Bonded rubber and rubber-like materials and bonded plastic materials in applications having product contact surfaces shall be bonded in such a manner that the bond is continuous and mechanically sound so that when exposed to the conditions encountered in the environment of intended use and in cleaning and bactericidal treatment or sterilization the rubber or rubber-like material or the plastic material does not separate from the base material to which it is bonded.

D.7
Gasket retaining grooves in product contact surfaces shall be no deeper than their width.

D.8
Radii

D.8.1
All internal angles of 135 degrees or less on product contact surfaces shall have radii of not less than 1/4 in. (6.0 mm) except that:

D.8.1.1
Where smaller radii are required for essential functional reasons, such as those in sensing devices for high pressure gauges. In no case shall such radii be less than 1/32 in. (1 mm).

D.8.2
The radii in gasket grooves or gasket retaining grooves, except those for 1/4 in. (6.0 mm) and smaller O-Rings, shall be not less than 1/32 in. (1 mm).

D.8.3
The radii in grooves for standard 1/4 in. (6.0 mm) O-Rings shall be not less than 3/32 in. (2.0 mm) and for standard 1/8 in. (3.0 mm) O-Rings shall be not less than 1/32 in. (1 mm).

D.8.4
The minimum radii for fillets of welds in product contact surfaces shall be not less than 1/4 in. (6.0 mm) except that the minimum radii for such welds may be 1/8 in. (3.0 mm) when the thickness of one or both parts joined is less than 3/16 in. (5.0 mm).

D.9
There shall be no threads on product contact surfaces.

D.10
Parts of instrument fittings and connections, such as ferrules, having a counterpart in the 3-A Sanitary Standards for Fittings, Number 08-17, rev. shall conform dimensionally to those standards.

D.11
Fittings, connections, gaskets (if used) and other component parts to be used in a processing system to be sterilized by heat and operated at a temperature of 250 degrees F (121 degrees C) or higher shall comply with the following additional criteria:

D.11.1
The construction shall be such that all product contact surfaces can be (1) sterilized by saturated steam or water under pressure at a temperature of at least 250 degrees F (121 degrees C) and (2) operate at the temperature required for processing.

D.11.2
Devices that have a product contact surface(s) to be used in such a processing system, not designed so that the system is automatically shut down if the product pressure in the system becomes less than that of the atmosphere and cannot be restarted until the system is resterilized, shall have a steam or other

sterilizing medium chamber surrounding the joint at the product contact surface between the fitting and the device.

D.11.3
The connection(s) on steam or other sterilizing medium chamber(s) for the steam or other sterilizing medium lines shall be such that the lines can be securely fastened to the connection(s). The lines shall be connected in a manner that they may be disconnected to allow the sterilizing medium chamber to be inspected and cleaned if necessary.

D.12
Instrument fittings/connections drawings are found in Appendix, Section H, Part Two of these standards. Dimensions and the contour of these fittings/connections shown on the drawings are for reference only and may be changed if they do not affect cleanability. Instrument fittings/connections not illustrated in these drawings shall be considered as being included in these standards, provided they conform to the provisions herein with respect to material, surface finish, fabrication and use of gaskets and have no special requirements for fabrication and installation.

D.13
Non-product contact surfaces shall be smooth, free of pockets and crevices and be readily cleanable and those to be coated shall be effectively prepared for coating.

E
SPECIAL CONSIDERATIONS
The criteria for fittings and connection having special requirements for fabrication or installation will be found in the following sub-sections:

E.1
Sensor spuds for tanks shall comply with the following: (See Appendix, Section H, 3-A drawings 3A-101-13, 3A-101-14, 3A-101-15, in Part Two.)

E.1.1
Shall be welded flush to the inside of the tank (vessel).

E.1.2
Shall have provision to drain leakage of product and if the tank is insulated, leakage shall drain beyond the insulation.

E.1.3
Shall be installed so that the leakage detection port, if provided, is at the bottom.

E.1.4
When the sensor capsule is in its installed position in the sensor spud, the O-Ring or gasket and diaphragm shall form a crevice-free joint, and shall be self draining.

E.2
Non-product contact surfaces that are prone to corrosion, such as aluminum connector heads, shall be so coated to resist attack by normally encountered cleaning and sanitizing solutions.

APPENDIX

STAINLESS STEEL MATERIAL
Stainless steel conforming to the applicable composition ranges established by AISI*1 for wrought products or by ACI*2 for cast products should be considered in compliance with the requirements of Section C.1 herein. Where welding is involved, the carbon content of the stainless steel should not exceed 0.08 percent. The first reference cited in C.1 sets forth the chemical ranges and limits of acceptable stainless steels of the 300 series. Cast grades of stainless steel corrseaponding to types 303, 304, and 316 are designated CF-16F, CF-8 and CF-8M, respectively. These cast grades are covered by ASTM*3 specifications A351/A351M, A743/A743M and A744/A744M.

*3 *Available from ASTM, 1916 Race St., Philadelphia, PA 19103-1187 (215-299-5400).*

G

PRODUCT CONTACT SURFACE FINISH

G.1

Surface finish equivalent to 150 grit or better, as obtained with silicon carbide, properly applied on stainless steel sheets, is considered in compliance with the requirements of Section D.1 herein.

H

DRAWINGS

This Appendix is continued in Part Two of these 3-A Sanitary Standards.

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PART TWO OF THE 3-A SANITARY STANDARDS FOR INSTRUMENT FITTINGS AND CONNECTIONS USED ON MILK AND MILK PRODUCTS EQUIPMENT

Number 09-08

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

It is the purpose of the IAMFES, USPHS, and DIC in connection with the development of the 3-A Sanitary Standards program to allow and encourage full freedom for inventive genius or new developments. Instrument fitting and connection specifications heretofore or hereafter developed which so differ in design, material, construction, or otherwise, as not to conform with the following standards, but which in the manufacturer's or fabricator's opinion are equivalent or better, may be submitted for joint consideration of the IAMFES, USPHS, and DIC at any time.

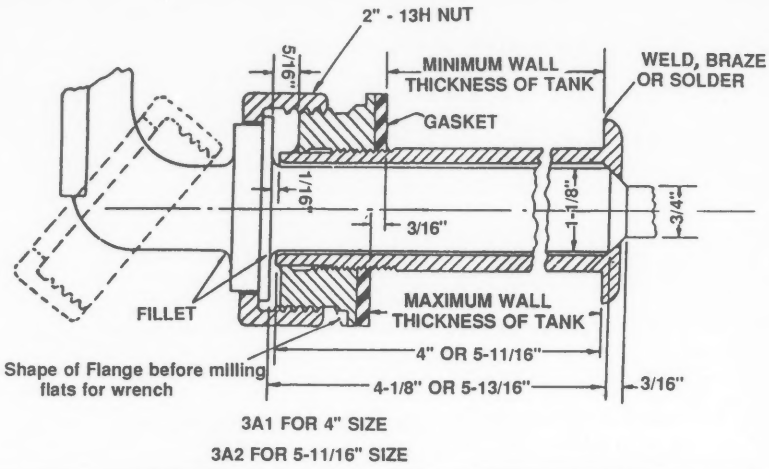
These 3-A Sanitary Standards are in two parts. This Part Two contains the drawings. Part One contains the text.

APPENDIX (Continued)

H Drawings of 3-A Instrument Fittings and Connections
Drawings of the following are included in this Appendix:

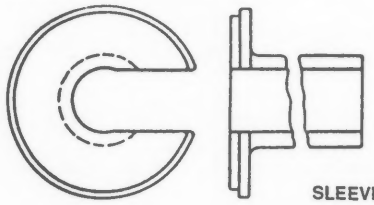
3A4	3 in 1 Recording thermometer fitting	8	3A-101-06
	Flange for split furrule	8	3A-101-06
	Bevel seat for split furrule	8	3A-101-06
3A5	Split ferrule (3 or 7.6 cm)	9	3A-101-07
3A6	Split ferrule (4 or 10 cm)	9	3A-101-07
3A5 & 3A6	Indicating thermometer	10	3A-101-08
3A7	Temperature sensor well (Short) for storage tanks	11	3A-101-09
3A8	Temperature sensor well (Long) for storage tanks	12	3A-101-10
3A9	Temperature sensor well (Short) for storage tanks	13	3A-101-11
3A10	Temperature sensor well (Long) for storage tanks	14	3A-101-12
(Note:	The temperature sensor portions of the 3A9 and 3A10 thermometer wells are longer than those of the 3A7 and 3A8 thermometer wells. Other dimensions are different.)		
3A11	Pressure sensor tank spud with O-Ring seal	15	3A-101-13
3A12	Pressure sensor tank with gasket seal and bolted connection	16	3A-101-14
3A13	Pressure sensor tank spud with self-sealing diaphragm	17	3A-101-15
3A14	Flush mount level shell/sensor	18	3A-101-16
3A15	Sanitary Temperature Sensors	19	3A-101-17
3A16	Sanitary Pressure Sensors	20	3A-101-18

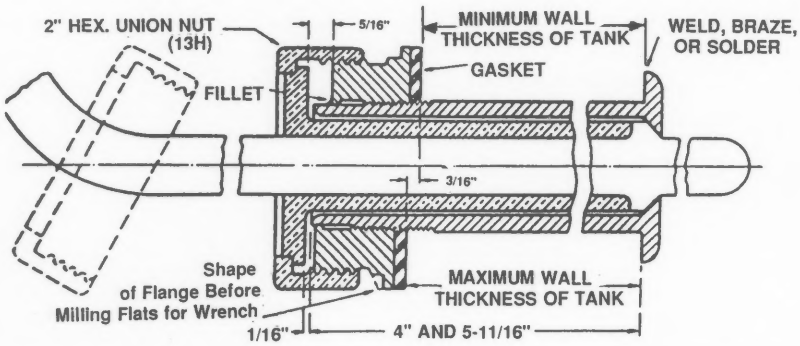
3A1 & 3A2 (TYPE RN) INDICATING THERMOMETER FOR TANKS AND VATS (SIDE WALL CONNECTION)



3-A STANDARD INSTRUMENT FITTINGS & CONNECTIONS 3A-101-01

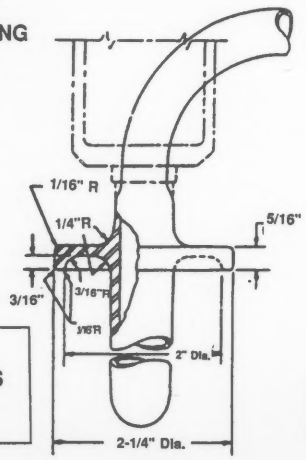
3A1 & 3A2 - 3 IN 1 FITTING FOR RECORDING THERMOMETERS AND CONTROLLERS (FOR JACKETED TANKS & VATS)



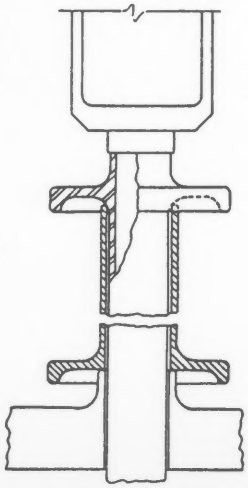


3-A STANDARD INSTRUMENT FITTINGS & CONNECTIONS 3A-101-02

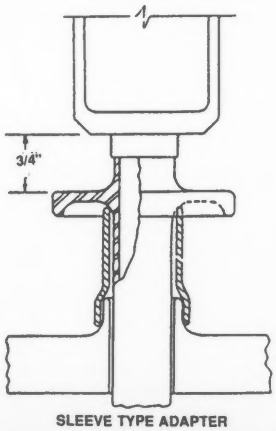
3A3 UMBRELLA-FLANGE FITTING FOR COVER INSERTION OF INDICATING OR RECORDING THERMOMETER BULBS



3A3 FITTING



FLANGE TYPE ADAPTER

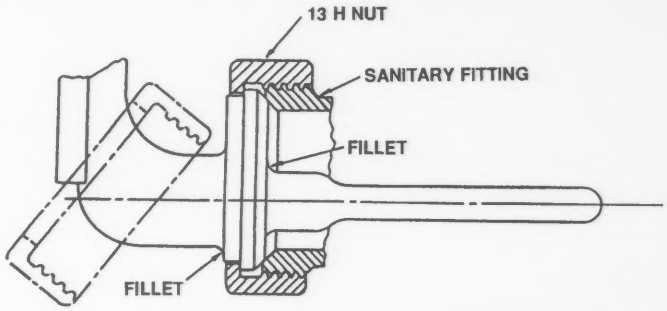


SLEEVE TYPE ADAPTER

(Adapters shown to illustrate acceptable methods of adjusting a thermometer stem length to fit a specific tank)

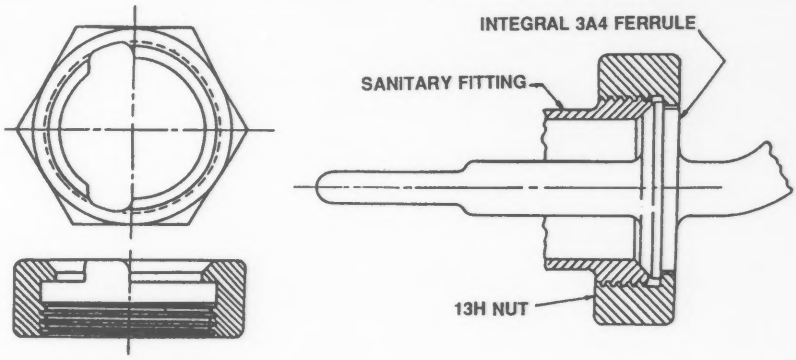
3-A STANDARD INSTRUMENT FITTINGS & CONNECTIONS 3A-101-03

3A4 (TYPE RN)
INDICATING THERMOMETER
FOR PIPE LINES



3-A STANDARD
INSTRUMENT FITTINGS
& CONNECTIONS
3A-101-04

3A4 (TYPE RN)
RECORDING THERMOMETER
BULB FOR PIPE LINES

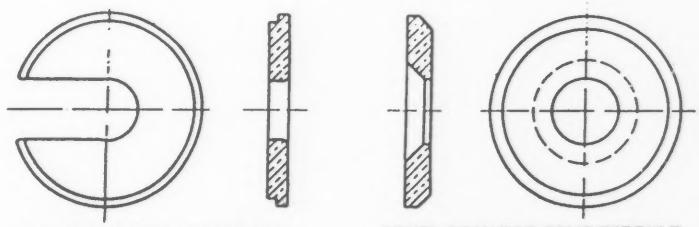


REMOVABLE UNION NUT

This nut can be removed over the ferrule. Its use is optional for instruments that would not otherwise permit removal. Design as illustrated or equivalent is acceptable.

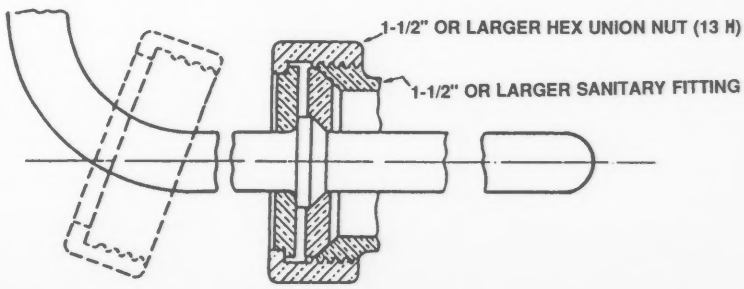
3-A STANDARD
INSTRUMENT FITTINGS
& CONNECTIONS
3A-101-05

3A4 3 IN 1 FITTING FOR
RECORDING THERMOMETERS
AND CONTROLLERS
(PIPE LINE FORM)



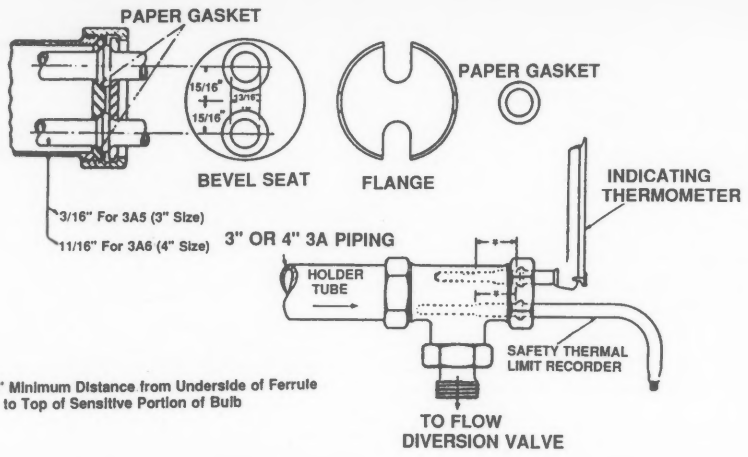
FLANGE FOR SPLIT FERRULE

BEVEL SEAT FOR SPLIT FERRULE



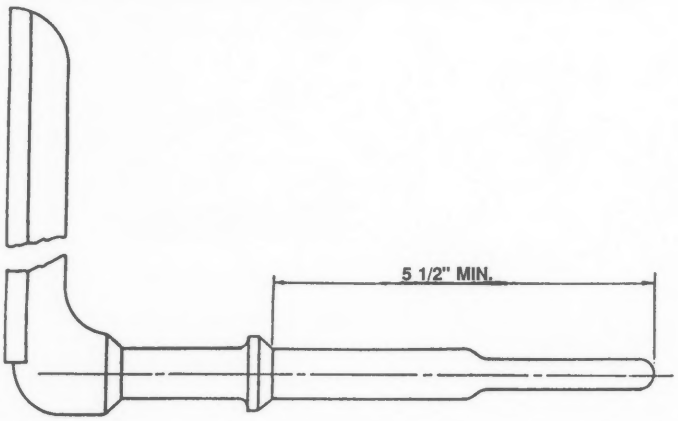
3-A STANDARD
INSTRUMENT FITTINGS
& CONNECTIONS
3A-101-06

3A5 & 3A6 DUAL FERRULE



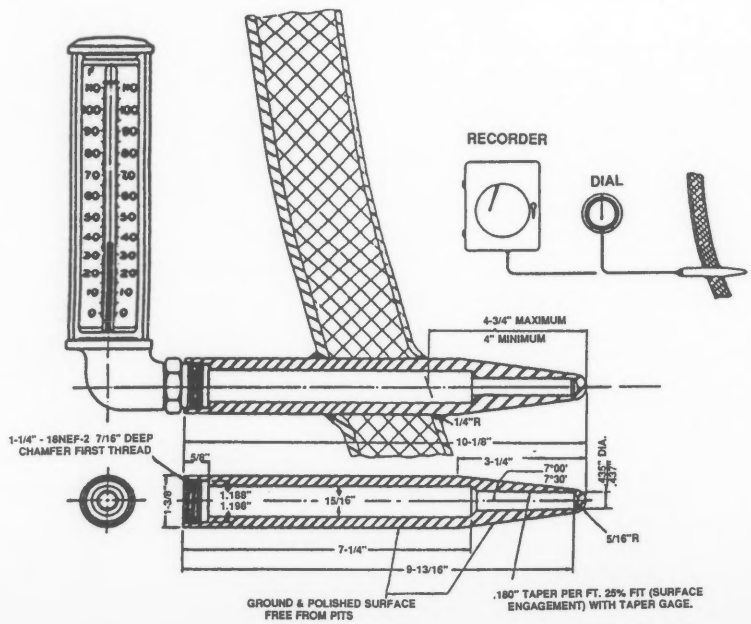
3-A STANDARD INSTRUMENT FITTINGS & CONNECTIONS 3A-101-07

3A5 & 3A6 TYPE INDICATING THERMOMETER FOR USE WITH SPLIT FERRULE



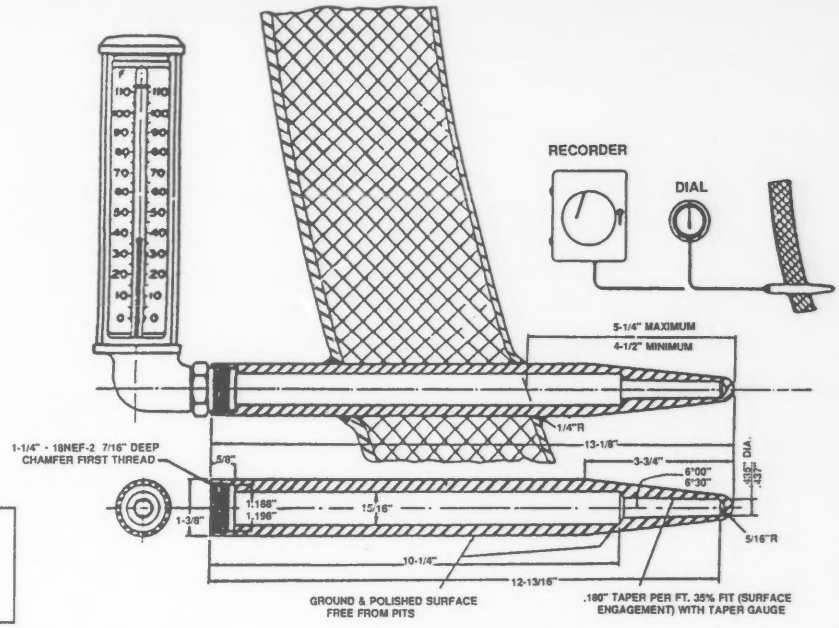
3-A STANDARD INSTRUMENT FITTINGS & CONNECTIONS 3A-101-08

3A7 THERMOMETER WELL (SHORT)



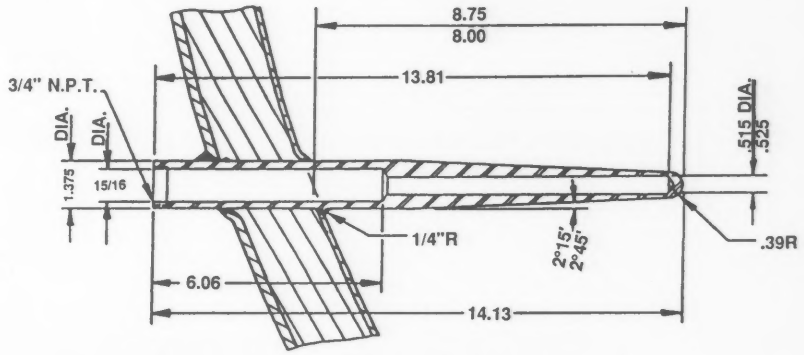
3-A STANDARD INSTRUMENT FITTINGS & CONNECTIONS 3A-101-09

3A8 THERMOMETER WELL (LONG)



3-A STANDARD INSTRUMENT FITTINGS & CONNECTIONS 3A-101-10

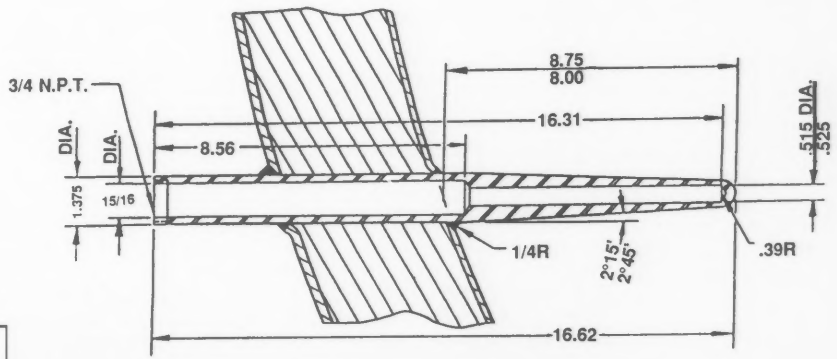
3A9 TEMPERATURE SENSOR WELL (SHORT) FOR STORAGE TANKS



3-A STANDARD INSTRUMENT FITTINGS & CONNECTIONS 3A-101-11

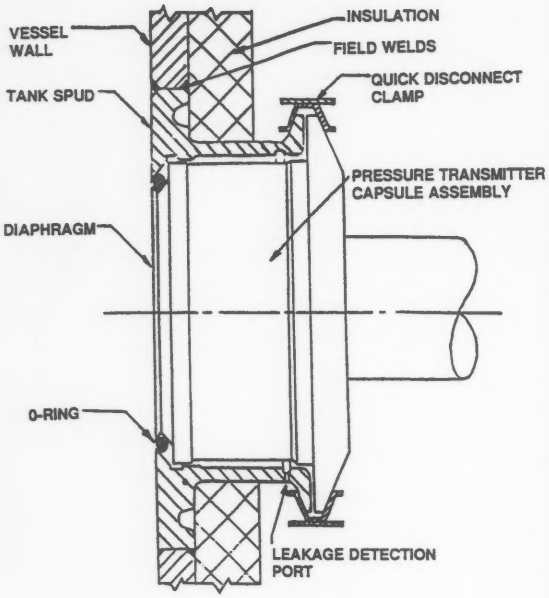
Note: The temperature sensor portion of this well is longer than that of 3A7 Thermometer Well. Other dimensions are different.

3A10 TEMPERATURE SENSOR WELL (LONG) FOR STORAGE TANKS



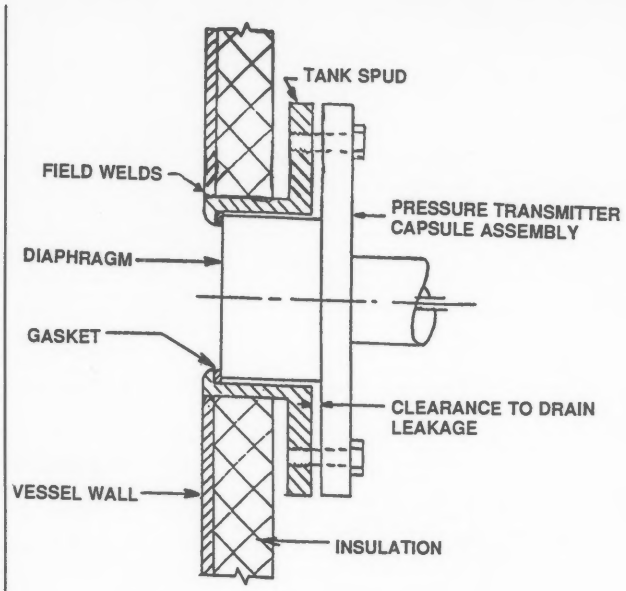
3-A STANDARD INSTRUMENT FITTINGS & CONNECTIONS 3A-101-12

Note: The temperature sensor portion of this well is longer than that of 3A8 Thermometer Well. Other dimensions are different.



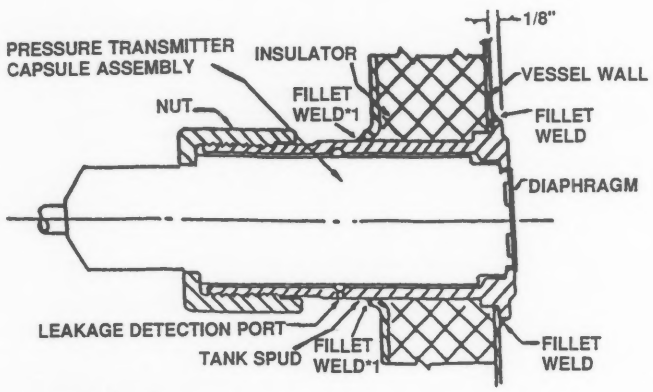
3A11 PRESSURE SENSOR
TANK SPUD WITH O-RING
SEAL

3-A STANDARD
INSTRUMENT FITTINGS
& CONNECTIONS
3A-101-13



3A12 PRESSURE SENSOR
TANK SPUD WITH GASKET
SEAL & BOLTED
CONNECTION

3-A STANDARD
INSTRUMENT FITTINGS
& CONNECTIONS
3A-101-14

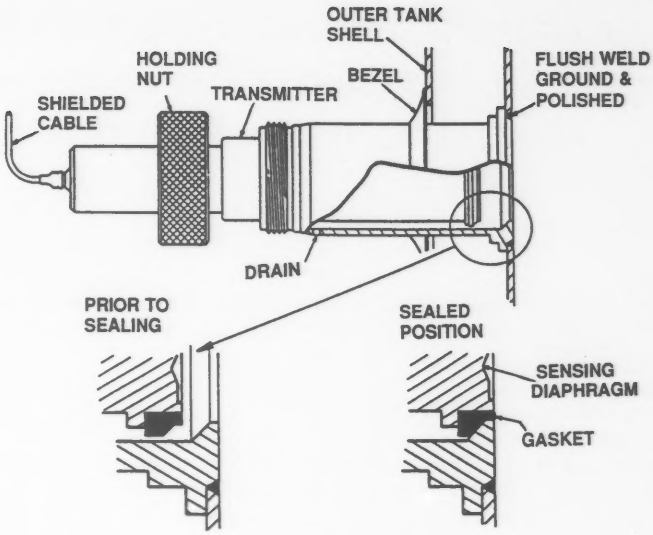


*1 A bezel may be used.

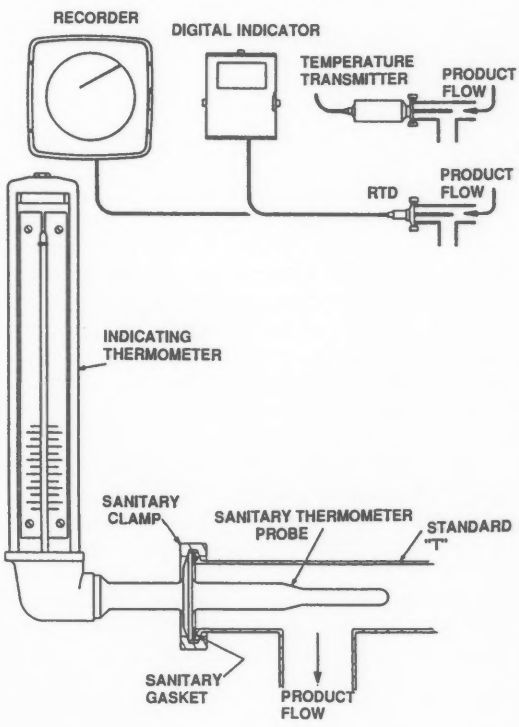
3A13 PRESSURE SENSOR
TANK SPUD WITH SELF
SEALING DIAPHRAGM

3-A STANDARD
INSTRUMENT FITTINGS
& CONNECTIONS
3A-101-15

3A14 FLUSH MOUNT
LEVEL SHELL/SENSOR

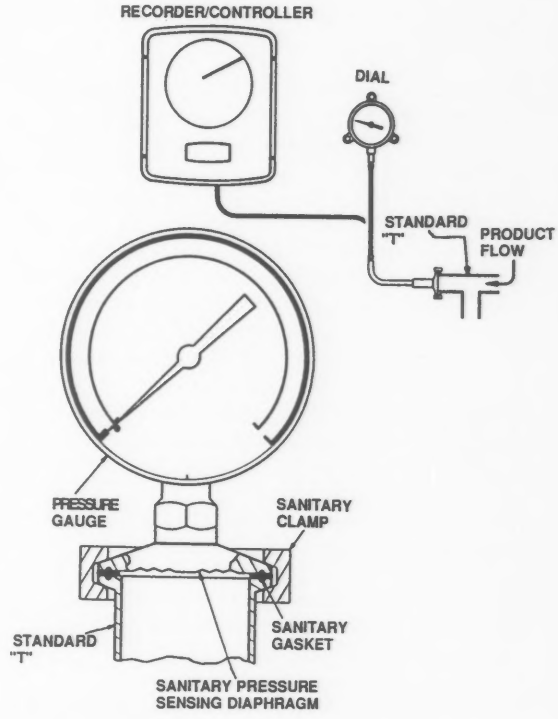


3-A STANDARD
INSTRUMENT FITTINGS
& CONNECTIONS
3A-101-16



3A15 SANITARY
TEMPERATURE SENSORS

3-A STANDARD
INSTRUMENT FITTINGS
& CONNECTIONS
3A-101-17



3A16 SANITARY
PRESSURE SENSORS

3-A STANDARD
INSTRUMENT FITTINGS
& CONNECTIONS
3A-101-18

3-A ACCEPTED PRACTICES FOR THE SANITARY CONSTRUCTION, INSTALLATION, AND CLEANING OF CROSS FLOW MEMBRANE PROCESSING SYSTEMS FOR MILK AND MILK PRODUCTS

Number 610-00

Formulated by

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

It is the purpose of the IAMFES, USPHS, and DIC in connection with the development of the 3-A Sanitary Standards program to allow and encourage full freedom for inventive genius or new development. Specifications for cross flow membrane processing systems heretofore and hereafter developed which so differ in design, material, fabrication, or otherwise as not to conform with the following accepted practice, but which, in the fabricator's opinion, are equivalent or better, may be submitted for the joint consideration of the IAMFES, USPHS, and DIC at any time.

A

SCOPE

A.1

These 3-A Accepted Practices pertain to the sanitary aspects of equipment necessary for cross flow membrane processing of milk and milk products beginning with the inlet to the supply tank which delivers the liquid product to the membrane equipment and/or the nearest valve which delivers water for diafiltration to the membrane equipment and terminates at the connections on the membrane equipment where retentate, concentrate and/or permeate leave the membrane equipment for storage or further processing. These processes include ultrafiltration, diafiltration, microfiltration, and reverse osmosis.

A.2

In order to conform with these 3-A Accepted Practices, membrane process systems shall comply with the following material, fabrication, construction, and cleaning criteria.

A.3

Components

Sanitary component equipment in membrane systems for which there are published 3-A Sanitary Standards or Accepted Practices shall comply with applicable provisions or those standards of practices.

B

DEFINITIONS

B.1

System: Shall mean all mechanical hardware, pumps, instrumentation and the membrane module(s).

B.2

Product: Shall mean milk, milk products, or their fractions which are fractionated, concentrated or otherwise processed in this equipment. Permeate, concentrate, and retentate are products.

B.2.1

Feed: Shall mean that portion of the product that is about to enter the element. It may include recycled permeate, concentrate or retentate.

B.2.2

Permeate: Shall mean that portion of the product which has passed through the membrane during processing.

B.2.3

Retentate: Shall mean that portion of the product which does not pass through the membrane during processing.

B.2.4

Concentrate: Shall mean that portion of the retentate that has left the system for disposition as final product or for recycling.

B.3

Module: Shall mean that part of the membrane equipment that contains the membrane elements, element connectors, and external shrouds or housings. The module interfaces with the system pipelines carrying product to and from it.

B.3.1

The boundaries of the module are defined as the connections between:

a. The feed manifold and the feed line(s) to the module.
b. The retentate collection manifold and the retentate line(s) from the module.
c. The permeate collection manifold and the permeate line(s) from the module.

B.4

Membrane Element: Shall mean that part of the module which contains the membrane and is replaceable. (The element may be identical with the module and may contain the membrane support material.) There are six configurations of elements. These are:

a. Tubular.
b. Spiral wound.
c. Plate and frame.
d. Parallel leaf.
e. Hollow fiber.
f. Monolithic ceramic.

In these different configurations, the membrane support material may be part of the replaceable element or part of the module structure.

B.5

Module Components

B.5.1

Anti-Telescoping Device: Shall mean a support for spiral type elements to prevent their layers from sliding past each other when the element is in operation.

B.5.2

Element Connector: Shall mean the device used within modules to connect together membrane elements. In some embodiments, the element connector may be incorporated into the anti-telescoping device.

B.5.3

External Shroud: Shall mean the impermeable shell which forms the exterior structure of the module. It may provide mechanical strength to resist internal operating pressure and may serve as a permeate collection vessel.

B.5.4

Membrane: Shall mean a selectively permeable barrier which can separate a multi-component product stream into fractions.

B.5.5

Membrane Support Material: Shall mean the material used for supporting the membrane.

B.6

Membrane Process Equipment: Shall mean equipment in which products are fractionated or concentrated by the cross flow membrane process.

B.7

Product Contact Surface: Shall mean all surfaces that are exposed to the product or any of its fractions (whether feed, concentrate, retentate, permeate) and surfaces from which liquid may drain, drop or be drawn into the products.

B.8

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

B.9

Mechanical Cleaning or Mechanically Cleaned: Shall denote cleaning solely by circulation and/or flowing chemical or enzyme cleaning solutions and water rinses onto, over, and/or through the surfaces to be cleaned, by mechanical means.

B.10

Automatic Cleaning and Sanitizing: Shall mean a programmed series of steps for cleaning and sanitizing the system that, once begun by the operator, will follow to completion without further action on the part of the operator.

B.11

Manifold: Shall mean that part of the system to which connections are

made to bring product, retentate, permeate, or cleaning solution to and from the module.

C

MATERIALS

C.1

All system product contact surfaces except those in the module shall be of stainless steel of the AISI 300 series*1 or corresponding ACI*2 types (See Appendix, Section G.), or metal which under the conditions of intended use is at least as corrosion-resistant as stainless steel of the foregoing types, and is non-toxic and non-absorbent except that:

C.1.1

Rubber and rubber-like materials may be used for gaskets, seals, O-Rings and where necessary for essential functional reasons, for flexible product connectors.

C.1.2

Rubber and rubber-like materials when used for the above specified applications shall comply with the applicable provisions of the 3-A Sanitary Standards for Rubber and Rubber-Like Materials, Number 18-00.

C.1.3

Plastic materials may be used for O-Rings, seals, flow meters, sight ports and where necessary for essential functional reasons, for product, permeate or element connectors.

C.1.4

Plastic materials when used for the above specified applications shall comply with the applicable provisions of the 3-A Sanitary Standards for Multiple-Use Plastic Materials, Number 20-15.

C.1.5

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

C.1.5.1

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

C.1.6

Where materials having certain inherent functional properties are required for specific applications, such as instrumentation, ceramic materials may be used. Ceramic materials shall be inert, non-porous, non-toxic, non-absorbent, insoluble, resistant to scratching, scoring and distortion when exposed to the conditions encountered in the environment of intended use and in cleaning and bactericidal treatment.

C.2

Non-product contact surfaces shall be of corrosion-resistant material or material that is rendered corrosion-resistant. If coated, the coating used shall adhere. Non-product contact surfaces shall be relatively non-absorbent, durable, and cleanable. Parts removable for cleaning having both product and non-product contact surfaces shall not be painted.

D

FABRICATION

D.1

All product contact surfaces except those in the module shall have a

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*1 The data for this series are contained in the AISI Steel Products Manual, Stainless & Heat Resisting Steels, December 1974, Table 2-1, pp. 18-20. Available from the Iron and Steel Society, 410 Commonwealth Drive, Warrendale, PA 15086 (412-776-9460).

*2 Alloy Casting Institute Division, Steel Founders Society of America, Cast Metal Fabrication Bldg., 455 State St., Des Plaines, IL 60016 (312-299-9160).

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

D.2

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

D.3

All appurtenances having product contact surfaces shall be easily removable for cleaning and inspection, or shall be mechanically cleanable.

D.4

Product contact surfaces not designed to be mechanically cleaned shall be easily accessible for manual cleaning and inspection either when in an assembled position or when removed. Removable parts shall be readily demountable for manual cleaning.

D.5

Connections in product contact surfaces except those in the module shall conform to 3-A Sanitary Standards for Fittings, Number 08-17, rev., and/or to the applicable provisions for welded product pipelines found in the 3-A Accepted Practice for Permanently Installed Sanitary Product Pipelines, Number 605-02, except that:

D.5.1

Where for high pressure or mechanical reasons, smaller sizes may be required for connection to manifolds, by-pass loops or instruments.

D.5.2

Rubber and rubber-like materials or plastic materials complying with C.1.2 and C.1.4 may be used for short flexible take-down jumpers or connectors. Flexible connectors having product contact surfaces shall have smooth sides without corrugations.

D.5.3

The connections to manifolds shall meet 3-A Sanitary Standards for Fittings, Number 08-17, rev., except that these connections may be made in a sanitary manner with rigid and/or flexible connectors provided the materials comply with the applicable provisions of 3-A Sanitary Standards for Multiple-Use Plastic Materials, Number 20-15.

D.6

Gaskets

D.6.1

Gaskets, except those in the module, having a product contact surfaces(s) shall be removable or be bonded.

D.6.2

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

D.6.3

Grooves in gaskets, except for those in the module, shall be no deeper than their width and the minimum radius of any internal angle shall not be less than 1/8 inch (3 mm) unless the gasket is readily removable for cleaning.

D.7

Gasket grooves or gasket retaining grooves in product contact surfaces for removable gaskets, except those in the module, shall not exceed 1/4 inch (6 mm) in depth and, except those for standard O-Rings smaller than 1/4 inch (6 mm) shall be at least 1/4 inch (6 mm) wide.

D.8

Radii

All internal angles of 135 degrees or less on product contact surfaces shall have minimum radii of 1/4 inch (6 mm), except those in membrane modules and the following:

D.8.1
The minimum radii in gasket grooves or gasket retaining grooves other than those for bonded gaskets or for standard 1/4 inch (6 mm) and smaller O-Rings shall be not less than 1/8 inch (3 mm).

D.8.2
The minimum radii in grooves for standard 1/4 inch (6 mm) O-Rings shall be not less than 3/32 inch (2 mm) and for standard 1/8 inch (3 mm) O-Rings shall be not less than 1/32 inch (1 mm).

D.8.3
In either case the internal product contact surface must be readily available for cleaning and inspection.

D.8.4
For essential functional reasons, smaller radii may be used provided the product contact surfaces are readily accessible for manual or mechanical cleaning.

D.9
There shall be no exposed threads on product contact surfaces except as may be provided by other 3-A sanitary standards for system components.

D.10
Membrane Processing System Supports
The membrane processing equipment shall be wall or leg mounted in a way that provides a clearance between the closest fixed point on the equipment and the wall or floor of at least 4 inches (10 cm) when the side or base outlines an area in which no point is more than 12 1/2 inches (32 cm) from the nearest edge, or a clearance of at least 6 inches (15 cm) when any point is more than 12 1/2 inches (32 cm) from the nearest edge.

D.10.1
Legs, if provided, shall be smooth with rounded ends and have no exposed threads. Legs made of hollow stock shall be sealed.

D.11
Non-Product Contact Surfaces
Non-product contact surfaces shall be of corrosion-resistant material or material that is rendered corrosion-resistant. If coated, the coating used shall adhere. Non-product contact surfaces shall be relatively non-absorbent, durable and cleanable. Parts removable for cleaning having both product and non-product contact surfaces shall not be painted.

E
INSTALLATION

E.1
All equipment, except service piping to heating and cooling equipment, shall be connected to each other with sanitary pipelines and fittings and shall be properly installed so as not to have any adverse effect on the processing parameters or product in the membrane system. Such parts and equipment shall be installed to facilitate easy cleaning, maintenance, and inspection.

E.1.1
Sanitary pipelines connecting all components of a membrane system shall be without dead-ends.

E.2
Automatic cleaning and sanitizing shall be provided to accomplish an automatic cleaning and sanitizing regimen for product contact surfaces designed for mechanical cleaning within the membrane process system. (See Section D.4.)

E.3
A daily log or record for each system shall be maintained during both operation and cleaning and sanitizing cycles showing:

1. The date.
2. Operating pressures.
3. Stream temperatures.
4. Feed, retentate, concentrate and permeate flow rates.
5. Element replacement.
6. Unusual occurrences.
7. Operator's signature or initials.

APPENDIX

F
CLEANING AND SANITIZING PROCEDURES

F.1
The choice of cleaning materials should be made with regard to the treated product and the limitation,

if any, of the system components.

F.2

A rinsing, cleaning, and sanitizing regimen which has been demonstrated to be effective for the specific configuration of elements should be used. Because of the possibilities of corrosion and membrane damage, the recommendations of the membrane process system manufacturer should be followed with respect to time, temperature, pressure, and the concentration of specific acid, alkaline, and/or enzyme solutions and sanitizers. To ensure proper strength of solution and to avoid corrosion, the cleaning compound should be completely dissolved or dispersed prior to circulation. A satisfactory cleaning regimen may be as follows:

F.2.1

Immediately after concluding operations, all connections between cleaned-in-place lines and processing equipment which are not to be included in the cleaning circuit should be removed, the openings capped, by-pass connections made, and the lines rinsed thoroughly with tempered water (not to exceed 120 degrees F or 49 degrees C entering the circuit) until the effluent is clear.

F.2.2

Circulate and/or soak an effective detergent and/or enzyme solution for a period of time at a concentration, temperature and velocity capable of effectively removing the soil residue in the circuit.

F.2.3

Thoroughly rinse the detergent and/or enzyme solution from the circuit.

F.2.4

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

F.2.5

Sanitize all product contact surfaces with one or a combination of the following commonly used methods taking care to use only a method the module manufacturer states the module will tolerate:

F.2.5.1

Circulation of water at a minimum temperature of 170 degrees F or 77 degrees C at the discharge end through the circuit for 5 minutes followed by displacement or draining. (Note that water heated for this purpose must be heated indirectly. Boiler water treatment compounds may not be compatible with the membranes.)

F.2.5.2

Pumping of a chemical sanitizer solution of effective strength and recommended temperature through product lines and equipment for at least one minute followed by displacement or draining. Such sanitizer should be in compliance with Food and Drug Administration regulations published in 21 CFR 178.1010 for sanitizing solutions.

F.2.5.3

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

F.3

Immediately after cleaning, the membrane system should be isolated from the mechanical cleaning system.

F.3.1

To prevent drying and consequent damage to the membranes, it is common practice to leave the system full of water after cleaning. It is important that the water used for this purpose be good quality potable water. The operator should sanitize the system again by the procedures of F.2.5.1 and F.2.5.2 immediately before the processing of the product.

F.3.2

The operator should be made aware that dirty water or cleaning compound used to make up cleaning solutions may contaminate the system.

F.4

Prior to installation, a description of the cleaning regimen which has been demonstrated to be effective for

each circuit should be made available to the processor by the membrane system manufacturer or distributor.

F.5

To demonstrate effective cleaning, periodic destruction and inspection of representative membrane elements may be required.

F.6

Other testing means such as Total Plate Count of clear water drained from the system may be run periodically to demonstrate proper cleaning of the system.

G

STAINLESS STEEL MATERIALS

Stainless steel conforming to the applicable composition ranges established by AISI*1 for wrought products or by ACI*2 for cast products, should be considered in compliance with the requirements of Section C.1 herein. Where welding is involved the carbon content of the stainless steel should not exceed 0.08%. The first reference cited in C.1 sets forth the chemical ranges and limits of stainless of the 300 series. Cast grades of stainless steel corresponding to types 303, 304, and 316 are designated CF-16F, CF-8, and CF-8M, respectively. These cast grades are covered by ASTM *3 specifications A351/A351M, A743/A743M and A744/A744M.

H

PRODUCT CONTACT SURFACE

Surface finish equivalent to 150 grit or better as obtained with silicon carbide properly applied on stainless steel sheets is considered in compliance with the requirements of Section D.1 herein.

These standards shall become effective September 8, 1990.

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*3 Available from ASTM, 1916 Race St., Philadelphia, PA 19103-1187 (215-299-5400).

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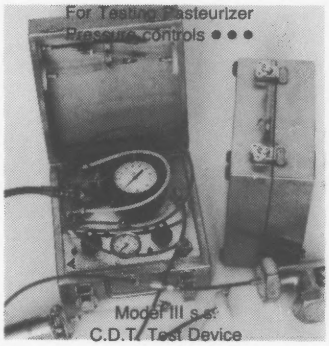

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Coming Events

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

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

•**10-12, Environmental Regulation Course** presented by Executive Enterprises, Inc. will be held at the Hotel Nikko Chicago, 320 N. Dearborn Avenue, Chicago, IL (312)744-1900. For more information call (800)831-8333 or (212)645-7880 (outside the U.S.).

•**16-18, American School Food Service Association 44th Annual Conference** to be held at the New Orleans Convention Center, New Orleans, Louisiana. For more information call (703)739-3900 or (800)877-8822.

AUGUST

•**5-8, IAMFES 77th Annual Meeting**, Woodfield Hilton Towers, Arlington Heights, IL. For more information, contact Steven K. Halstead, IAMFES, Inc., 502 E. Lincoln Way, Ames, IA 50010 (800)369-6337.

•**6-7, Pesticide Applicator Certification Seminar**, Okumura Biological Institute, Holiday Inn, Elk Grove Village, IL. Contact George Okumura, 6669 14th Street, Sacramento, CA 95831 (916)421-8963.

•**7-8, Dietary Managers Association Meeting** to be held at the Hyatt Orlando, Orlando, Florida. For more information call (708)932-1444 or (800)323-1908.

•**7-11, 2nd Latin-American Congress of Biotechnology** to be held in LaHabana, Havana, Cuba. For more information contact the Organizing Committee, P.O. Box 6162, Havana, Cuba. Telex: 512330 ing gen cu, 511072 cubacib. Telephone: 21-8039, 20-1400, 20-1402, 20-1408, 21-8466, 21-8164, 21-8008. FAX: 53-7-218070.

•**8-9, Advance Pesticide Technology for the Food Industry Seminar**, Okumura Biological Institute, Holiday Inn, Elk Grove Village, IL. For more information contact George Okumura, 6669 14th Street, Sacramento, CA 95831 (916)421-8963.

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

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

•**27, Pesticide Applicator Certification Seminar**, Okumura Biological Institute, Clarion Hotel, Sacramento, CA. For more information contact George Okumura, 6669 14th Street, Sacramento, CA 95831 (916)421-8963.

SEPTEMBER

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

•**12-14, Environmental Regulation Course** presented by Executive Enterprises, Inc. will be held at the Hotel Pontchartrain, Two Washington Blvd, Detroit, MI (313)965-0200. For more information call (800)831-8333 or (212)645-7880 (outside the U.S.).

•**13-14, Minnesota Sanitarians Association, Inc.** Annual Conference will start at 1:00 p.m. on September 13 at the Earle Brown Center, University of Minnesota. Annual meeting will start at 4:30 p.m. on September 13 with the Awards Banquet at 6:00 p.m. at the Holiday Inn, Shoreview. For further information call Roy E. Ginn at (612)785-0484.

•**13-14, Annual Wisconsin Laboratory Association's Educational Conference** will be held in Brookfield, WI. The Conference will be held at the Mariott Convention Center. For more information please contact Mr. Malin Benicek, Sanofi Bio Ingredients, 620 Progress Avenue, Waukesha, WI 53186.

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

•**19-20, Wisconsin Association of Milk and Food Sanitarians Annual Meeting**, Pioneer Inn, Oshkosh, WI. For more information contact Neil Vassau (608)267-3504.

•**25-27, Environmental Regulation Course** presented by Executive Enterprises, Inc. will be held at the Dallas Marriott Park Central, 7750 LBJ Freeway @ Coit Road, Dallas, TX 75251 (214)233-4421. For more information call (800)831-8333 or (212)645-7880 (outside the U.S.).

•**26-27, Joint Annual Convention of the South Dakota State Dairy Association and Dairy Fieldmen's Association** to be held at the Holiday Inn, Brookings, SD. For information contact Dr. John Parsons, Dairy Science Department, SDSU, Box 2104, Brookings, SD 57007 (605)688-4116.

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

OCTOBER

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

•**15-16, Pests Associated with Food Industry and Environmental Sanitation Seminar**, Okumura Biological Institute, Holiday Inn, Elk Grove Village, IL. For more information contact George Okumura, 6669 14th Street, Sacramento, CA 95831 (916)421-8963.

•**17-18, Advanced Course on Pest Recognition and Food Industry Problems**, Okumura Biological Institute, Holiday Inn, Elk Grove Village, IL. For more information contact George Okumura, 6669 14th Street, Sacramento, CA 95831 (916)421-8963.

•**17-18, North Central Cheese Industries Association Annual Conference**, will be held at the South Dakota State University, Brookings, SD. For more information contact E.A. Zottola, Executive-Secretary, NCCIA, P. O. Box 8113, St. Paul, MN 55108.

NOVEMBER

•**4-7, National Fisheries Institute** will hold its 44th annual convention at the new Marriott Marquis, San Francisco, CA. For more information contact Pat McCoy, convention coordinator (703)524-8882.

•**6-8, International Cheese Technology Exposition** will be held in Milwaukee, Wisconsin. For further information contact: USCMA/WEMA, P.O. Box 2133, Madison, WI 53701 (608)255-2027.

•**28, Ontario Food Protection Association Annual Meeting**, will be held at the Airport Hilton Hotel, Toronto, Ontario. The title of the all-day symposium is "FOOD PROTECTION: HOT TOPICS FOR THE '90's". For more information, please contact program convenors: Garth Sundeen (416)239-8411 or FAX (416)239-2416 or Patrick Kwan (416)671-5080 or FAX (416)671-5176.

To insure that your meeting time is published, send announcements at least 90 days in advance to: IAMFES, 502 E. Lincoln Way, Ames, IA 50010.

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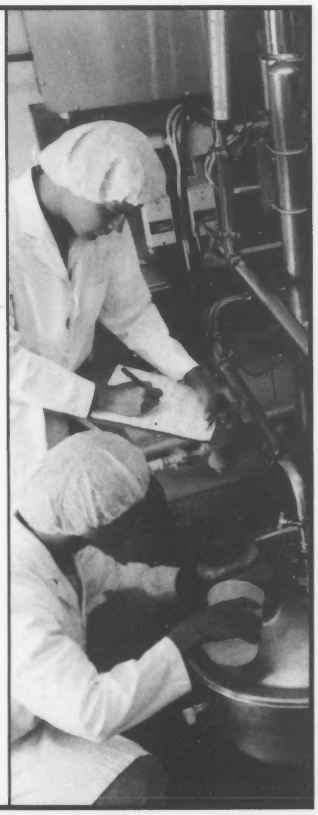

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From the Ames Office . . .

By
Steven K. Halstead
IAMFES
Executive Manager

Several years ago, there was a popular song going around entitled "50 Ways to Leave Your Lover." I probably wouldn't have paid much attention to the song except that I had a friend who hated the song so much that he demanded that it not be played in his presence. (He was coming off a bitter divorce and way #1 - "walk out the door" hit pretty close to home).

His aversion to the song caused me to pay particular attention to it - when he wasn't present. The song simply recited 50 different ways to end a relationship. Some were simple; some were weird; none were free from pain.

How may ways are there to leave your professional organization?

If your only involvement with your professional association is paying the dues, leaving it can be very painless indeed. Just walk out the door, that is, don't pay your dues.

But if you are involved with your association, the separation can be very painful indeed. A case in point.

I am taking a course in beginning accounting which is offered by a local college. I have wanted do this for several years, but have never had the time - too busy. This year, I made up my mind that I was going to do it.

The class meets on Monday and Wednesday evenings. It also happens that my professional association - the Iowa Society of Association Executives - meets on the last Monday of the month. I made a commitment to the class, so I have given up ISAE, for the time being.

By giving up this association with my peers, I gave up:

1. Educational programming that was specifically aimed at helping me grow as a professional association manager.

2. The camaraderie around the dinner table with the good spirited give and take that goes on between friends.

3. The inside scoop (read that gossip) from the lobbying corners of the State House. (I've always found this more interesting and more accurate than the accounts I can read in the newspaper.)

4. The opportunity to meet with peers to discuss mutual problems we encounter in the day to day operation of an association.

5. The opportunity to learn the industry gossip - who's leaving what group; who's been hired, fired, retired, etc.

6. The opportunity to learn about new programs being launched by other associations.

7. The opportunity to learn about new and innovative non-dues income generators.

8. A good time with my friend and colleagues.

This list could go on and on, but I'm getting depressed. When I started writing this, I knew I missed not being able to attend ISAE, but I didn't realize how much! Boy, I can hardly wait til my class is over and I will be able to attend the ISAE meetings again! But I digress.

It is our goal to make leaving IAMFES as painful as possible. As you read through the list of things I am missing out on by not participating in my professional association, I sincerely hope that some, if not all, strike a responsive chord with you. I very much believe that you and I both are seeking the same things from our associations.

I know I am getting them from mine. Do you? I hope so, because, if not, ... "there must be 50 ways to leave your association."

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

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